

**SOUTHERN REGION CONFERENCE  
PROCEEDINGS OF PAPER PRESENTATIONS**



**HELD IN CONJUNCTION WITH THE MEETING OF THE  
SOUTHERN ASSOCIATION OF AGRICULTURAL SCIENTISTS (SAAS)**



**February 2 – February 5, 2019 – Birmingham, AL**

**Hosted by**

**North Carolina State University, Raleigh, NC**

**North Carolina A&T University, Greensborough, NC**

**University of Mt. Olive, NC**

**Clemson University, South Carolina**

**Auburn University, Alabama**

**SOUTHERN REGION CONFERENCE**  
**AMERICAN ASSOCIATION FOR AGRICULTURE EDUCATION**  
**February 2 – February 5, 2019 – Birmingham, AL**

**Southern Association of Agricultural Scientists (SAAS)**

**Agricultural Education Division Officers**

President and Conference Co-Chairs: Barbara Kirby, Wendy Warner, Joy Morgan,  
Jay Jayaratne, Marshall Baker, Joseph Donaldson, Travis Park, NC State University

Co-Chairs: Catherine DiBenedetto, A. Preston Byrd, Clemson

Co-Chair: Stephen Edwards, University of Mt. Olive

Co-Chair: Antoine Alston, A&T State University

Co-Chair: James Lindner, Auburn University

President-Elect: Barry Croom, University of Georgia

Past President: John Ricketts, Tennessee State University

**American Association for Agricultural Education (AAAE) Southern Region Officers**

Vice-President: Travis Park, NC State University

Alternate Vice-President: Tracy Rutherford, Texas A&M University

Secretary: Wendy Warner, NC State University

## Manuscript Reviewers for 2019 AAAE Southern Region Research Conference

The AAAE Southern Region members express their sincere gratitude to the following AAAE colleagues who served as reviewers for the 2018 AAAE Southern Region Research Conference.

Antoine Alston	Chris Estepp	Tobin Redwine
James Anderson II	Paula Faulkner	John Ricketts
Marshall Baker	Jim Flowers	Grady Roberts
Matt Baker	Curt Friedel	Richie Roberts
Kirby Barrick	Kyle Gilliam	Shane Robinson
Kimberly Bellah	Donna Graham	Eric Rubenstein
Matthew Benge	Laura Greenhaw	Donna Westfall-Rudd
Will Bird	Roger Hanagriff	Rick Rudd
Joey Blackburn	Amy Harder	Joy Rumble
Gary Briers	Jay Jayaratne	Tracy Rutherford
Jackie Bruce	Adam Kantrovich	Quisto Settle
JC Bunch	Barbara Kirby	Kate Shoulders
Alex Byrd	Alexa Lamm	Alyx Shultz
Steven Chumbley	David Lawver	Kristin Stair
Chris Clemons	James Lindner	Nicole Stedman
Barry Croom	Gary Moore	Carrie Stephens
Catherine DiBenedetto	Carley Morrison	Katie Stofer
Joseph Donaldson	Tim Murphy	Chris Stripling
Kim Dooley	Brian Myers	Robert Strong
Tiffany Drape	Michael Newman	Kirk Swortzel
James Dyer	Summer Odom	Andrew Thoron
Don Edgar	Ed Osborne	Stacy Vincent
Leslie Edgar	Travis Park	Laura Warner
Craig Edwards	Jason Peake	Wendy Warner
Rebekah Epps	Bryan Rank	Gary Wingenbach

## Table of Contents

*Note: One page written remark was requested from the paper discussants. However, some provided and some did not provide a written remark. The papers received written discussant remarks are posted at the end of the paper.*

<b><u>Session A - Diversity and Inclusion</u></b>	<b>Page</b>
<b>Barriers, Challenges, and Alternatives of Recruiting Minority Students into Secondary School Agriculture Education Programs</b>	<b>9</b>
K. S. U. Jayaratne, Travis Park, Jason Davis	
<b>Women Faculty in Postsecondary Agricultural and Extension Education: A Fifteen Year Update</b>	<b>24</b>
Lauren Lewis Cline, Haley Rosson, Penny Pennington Weeks	
<b>Empowering Underrepresented Populations in STEM: Experiences of Agricultural Education Majors During a Service-Learning Project</b>	<b>39</b>
Richie Roberts, Chastity Warren English, Antoine J. Alston	
<b><u>Session B – Professional and Institutional Improvement</u></b>	
<b>There's No Place Like Home: Why Students Enrolled in an Agricultural Leadership Degree Completion Program</b>	<b>58</b>
Penny Pennington Weeks, William G. Weeks, Lauren Lewis Cline	
<b>Does Experiential Learning Improve Student Performance in an Introductory Animal Science Course?</b>	<b>70</b>
Eric D. Rubenstein, Savannah R. White, C. Robert Dove, T. Dean Pringle	
<b>Coauthor Network Analysis of Journal of Agricultural Education Articles from 2008-2017</b>	<b>84</b>
Quisto Settle, Kathryn L. Teixeira, Rachel Bechtold, Catherine W. Shoulders, Audrey E. H. King	

### **Session C – Community and Local Issue Engagement**

**Why do Growers Adopt Water Conservation Practices? Viewing Extension Opportunities through a New Lens** 99

Laura Warner, Alexa Lamm, Sarah White, Paul Fisher, Peyton Beattie

**Combining School-Community Partnerships and Entrepreneurship in an Agricultural Marketing Curriculum: The Students' Perspective** 117

Brooke Griggeory, Stacy K. Vincent, Carol D. Hanley, Daniel W. Kahl

**The Influence of Demographic Variables on Community Members' Perceptions of Community Viability** 135

Chantel Simpson, Lane Woodward, Rachel Mack, Asha H. Shayo, Sarah A. Bush, Rick Rudd

### **Session D – Community and Civic Engagement**

**Factors Impacting Civic Responsibility Development During FFA Civic Engagement Activities** 151

Will Bird, Amanda Bowling, Anna Ball

**Benefits of Using Service-Learning in the Preparation of Teachers: An Analysis of Agricultural Education Teacher Educators' Beliefs and Intentions** 170

Richie Roberts, M. Craig Edwards, J. Shane Robinson

**Agriculture Organization Members' Communication Preferences and Motivation to Contact Elected Officials about Agriculture and Natural Resources Issues** 189

Levy Randolph, Caroline Roper, Shelli D. Rampold, Ricky W. Telg

### **Session E – Enhancing Learning Experiences**

**Developing Metrics for Predicting Student Motivation to Enroll in a Short-Term Study Abroad Course from an Expectancy-Value-Cost Perspective** 206

Brandon M. Raczkoski, J. Shane Robinson, M. Craig Edwards, Marshall A. Baker,  
Sarah R. Gordon, and Ki L. Matlock-Cole

**The Ugly Truth of Student-Teacher (Dis)engagement: An Ethnographic Account** Ashley M. Yopp, Billy R. McKim, Yvonna S. Lincoln 223

**Utilizing Videos to Encourage Elaboration and Improve Attitudes Toward Fertilizer Best Practices** 239

Tiffany M. Rogers-Randolph, Laura A. Warner, Joy N. Rumble

**Session F – Secondary Based Agricultural Education**

**Determining the Effects of the Smartphone as a Learning Tool on the Motivation of School-Based Agricultural Education Students in Louisiana** 257

H. Eric Smith, J. Joey Blackburn, Kristin S. Stair, Michael F. Burnett

**Identifying the Characteristics Necessary for Becoming an Effective Agricultural Education Teacher: A National Study** 274

Christopher J. Eck, J. Shane Robinson, Jon W. Ramsey, Ki L. Matlock-Cole

**Teaching Students with Special Needs in School-Based, Agricultural Education: A Historical Inquiry** 291

Kathryn L. Teixeira, M. Craig Edwards

**Session G – Faculty Teaching and Learning**

**Perceived Self-efficacy for Teaching and Faculty Development Needs of Early Career Faculty at Land Grant Universities** 311

Lucas Maxwell, Will Bird, Anna Ball

**Exploring Learning Styles Expressed In Teaching Philosophies Among University Faculty** 329

Tyler D'Angelo, Jessica Harsh, J.C. Bunch, Alexa J. Lamm, Andrew Thoron, T. Grady Roberts

**The Rookie: Describing a Researcher's First Year Teaching in a University Classroom 345**

Emma Winterhalter, Carley C. Morrison, Jesse I. Morrison

**Session H – Undergraduate and Secondary Curriculum Development**

**Undergraduate Students' Perceptions of Team-Based Learning During an Introductory Agricultural Mechanics Course: A Mixed Methods Study 363**

Whitney L. Figland, J. Joey Blackburn, Richie Roberts

**Improving Forestry Secondary Education: Identifying Teachers' Needs 380**

Eric D. Rubenstein, Carolyn A. Copenheaver, Jason B. Peake

**I think I can!: Utilizing Goal Orientations and Academic Efficacy to Predict the Academic Performance of Freshmen College of Agriculture Students 393**

Olivia M. Soler, Adam M. O'Malley, Whitney L. Figland, Morgan A. Richardson, J. Joey Blackburn, Kristin S. Stair, Richie Roberts

**Session I – Leadership Development and Goal Setting**

**Leadership Development Program Satisfaction: An Evaluation of the Role of Leader Member Exchange 410**

Kevan W. Lamm, Kerry Priest

**Undergraduate Goal Setting: Analyzing Personality as a Predictor 425**

Kevan W. Lamm, Emana Sheikh, Don W. Edgar

**Evaluating Leadership Development Programs: A Social Network Analysis Approach** 441

Kevan W. Lamm, Hannah S. Carter

**Alternate Papers**

**A Canon of Classics: Foundational Readings for Doctoral Students in the Broad Discipline of Agricultural Education** 457

Sharon Wagner, Tracy Rutherford

**Communicating with Elected Officials: County Commissioners' Communication Preferences and Factors Impacting Agriculture Policy Decisions** 474

Kati Lawson, Kevin Kent, Ricky Telg, Shelli Rampold, Ashley McCleod

# **Barriers, Challenges, and Alternatives of Recruiting Minority Students into Secondary School Agriculture Education Programs**

K. S. U. Jayaratne, North Carolina State University, Raleigh  
Travis Park, North Carolina State University, Raleigh  
Jason Davis, North Carolina State University, Raleigh

## **Abstract**

*The United States population is becoming increasingly diverse, and agricultural education should represent that diversity. Researchers conducted a Delphi study of 12 exemplary agriculture programs with diverse student populations in North Carolina. After three rounds, consensus was reached about 11 strategies useful in recruiting minority students, including most prominently, (1) making personal connections with potential students, (2) students recruiting their minority friends, (3) minority students recruiting other minority students, (4) showcasing exceptional minorities who have succeeded in the agriculture field, and (5) being yourself and care for your students. The study also identified 12 alternatives helpful in retaining the minority students into another agriculture course or FFA, most prominently, (1) buying-in from friends, (2) talking to minority students already in the program, (3) building teacher and student relationship, (4) creating interest in agriculture subjects, and (5) getting minority students connected and involved.*

## **Introduction**

United States population is becoming increasingly diverse. According to the U.S. Census (2016), the U.S. population diversity includes 61.3% Whites (not Hispanic), 17.8% Hispanics or Latinos, 13.3% African Americans, 5.7% Asians, 1.3% Native Americans or Alaskan Natives, 0.2% Hawaiian and Pacific Islanders, and 2.6% two or more race individuals. This population data indicate that almost 40% of the U.S. population comprises ethnic minorities. However, this ethnic diversity in the U.S. population does not reflect necessarily in secondary school agriculture programs (Bowen, 2002; LaVergne, Larke, Elbert, & Jones, 2011; Lawrence, Rayfield, Moore, & Outley, 2013; Talbert & Larke, Jr., 1995). Enrollment of minorities into education programs is important due to changing demographics in the U.S. (Cano & Bankston, 1992). The vast majority of students in secondary school agriculture education programs are White students. The secondary school agriculture education program is the beginning step of recruiting students into the agriculture professional preparation pipeline. Additionally, secondary school agricultural education programs are important sources for recruiting potential students into higher education in agriculture (Talbert & Larke, Jr., 1995). Due to this reason, lack of minority representation in secondary school agriculture programs is a national issue that agriculture education professionals need to pay due attention. Exploring barriers preventing recruitment of minority students in secondary agricultural education programs and challenges faced by teachers of agriculture are helpful in understanding the alternatives effective in recruitment.

## **Barriers**

Many barriers exist between students and agricultural education programs preventing student enrolment in secondary agricultural education. Some of these barriers include student perceptions toward agricultural education programs, negative attitudes, and scheduling conflicts (FFA, 1999). A Delphi study conducted with a national panel of agriculture teachers over 15 years ago identified “scheduling difficulties, finding time to recruit, student involvement in other activities, access to students, competition from other programs, lack of guidance counselor support, increased graduation requirements, image of agriculture, lack of interest in agriculture, and block scheduling” as problems in recruiting students into secondary school agricultural education programs (Dyer & Breja, 2003, p.75). A research conducted in Ohio in the early 1990s to ascertain the barriers preventing minorities’ participation in 4-H programs indicated their lack of knowledge about the program was an important barrier prevented their involvement in the program (Cano & Bankston, 1992). Another barrier prevented them getting into the program was lack of advertisements relating to minorities. A study conducted with secondary school students in Texas reported that minority students had less of a rural and farm background compared to that of White students (Talbert & Larke, Jr., 1995). In addition to lack of rural background, this study reported that minority students were not exposed to agricultural youth development programs and 4-H programs to the same extent as White students were exposed. Lack of minority role models in agriculture profession is another hindrance to recruitment of minorities into agricultural education (LaVergne et al., 2011). All of these factors contributed to limit minority students’ exposure to agriculture and acted as a barrier to their appreciation of agriculture as a profession.

### **Challenges**

There is a need for diversity inclusion in secondary school agricultural education programs to reflect the increasing ethnic diversity in the U.S. Available literature (Banks, 2008; LaVergne et al., 2011; Warren & Alston, 2007) supports the notion that ethnic diversity in the classroom is making positive impacts on students. However, achieving diversity in the secondary school agricultural education classroom is not yet up to the level it should be despite many efforts. Increasing the diversity in secondary school agricultural education programs remains a challenge that educators need to address realistically. Many factors contribute to this situation. For instance, minority students tended to have negative attitudes toward agriculture and perceived that agriculture occupations are mainly production-focused and those jobs do not require professional education (Talbert & Larke, Jr., 1995). This mindset of minority students is a considerable challenge to overcome when planning to recruit minorities into agricultural education programs. Minority students tend to enroll in agriculture courses if the agriculture teacher is a minority himself or herself (Talbert & Larke, 1995). However, only small percentage of minorities enter into the agricultural education profession (Camp, 1995; Jones & Bowen, 1998). Overall, secondary teachers in the U.S. are not racially diverse as the student population. For instance, in the 2011-2012 school year, only 18% of teachers were minorities while 49% of the students were minorities (USDE, 2016).

### **Recruitment Strategies**

Agriculture teachers are mainly responsible for recruiting potential students into agricultural education programs. LaVergne et al. (2011) asserted the need for increasing agriculture teachers’ effort to recruit minorities into secondary agricultural education programs. In the recruitment process, agriculture teachers will have to convince potential students as well

as others such as parents, school administrators, and counselors who could influence students' decision to enroll in agricultural education and understand the benefits of studying agriculture. Marketing agricultural education programs to potential students requires a strategic commitment from agricultural education teachers (FFA, 1999). Teachers who relate well to all students and make learning enjoyable are capable of recruiting African American students (Ladson-Billings, 1994). Confirming this notion, Jones and Bowen (1998) found enthusiastic teachers who could relate well to all students were able to enroll the highest number of African American students in their agriculture education programs. Jones and Bowen (1998) recommended using minority students to recruit other minority students, use of minority professionals as role models, and enhanced teacher communication with the parents of minority students as strategies to recruit minorities into agricultural education. Myres, Dyer, and Breja (2003) reported minority recruitment success when agriculture teachers and students contacting other potential students, use of the FFA and promotional communications through various channels, a strong agri-science curriculum, use of agricultural education support groups, and the use of recruitment events as effective strategies to recruit students into agricultural education programs. A study conducted at the University of Missouri to determine the strategies effective in recruiting African American students into college of agriculture revealed that the majority of students' decision to apply for admission was influenced by their visit to campus and having a discussion with a representative from the college of agriculture, access to college website, and printed university publications (Burns, 2006). This study also found that parents and relatives were the most influential factor when African American students made their decision to college education.

Lack of minority students enroll in secondary school agriculture education programs is a national issue need the attention of agriculture educators and it is the focus of this study. This study relates to research priorities three and five of the National Research Agenda (Roberts, Harder, & Brashears, 2016).

### **Purpose**

The purpose of this Delphi study was to determine the barriers and challenges of recruiting minority students into secondary agricultural education programs and alternatives to overcome those barriers and challenges. The study aimed to find answers to the following questions:

1. What are the barriers preventing minority students' enrollment in agricultural education programs?
2. What are the challenges preventing minority students' enrollment in agricultural education programs?
3. What are the alternatives to overcome barriers and challenges preventing minority students' enrollment in agricultural education programs?

### **Conceptual Framework**

Researchers conceptualized the study based on Bronfenbrenner's (1979) ecological systems theory. Bronfenbrenner's (1979) ecological systems theory explained the importance of studying a child in the context of multiple environments, also referred to as 'ecological systems' for understanding his or her development. Normally, a child is interacting with different ecosystems simultaneously from most intimate home ecological system to most distance society and culture. Bronfenbrenner (1979) explained five different ecological systems that influence the

development of a child. These five systems are 1) microsystem, 2) mesosystem, 3) exosystem, 4) macrosystem, and 5) chronosystem. Microsystem is the closest environment in which the child lives and makes interactions frequently with individuals such as family members, teachers, and friends. Microsystem comprises the interaction of different environments such as home, church, school, etc. where the growing child interacts with others daily. Interactions in the microsystem involve personal relationships with the members in the system. These interactions with the child influence how the child develops. As a reciprocation to these interactions, how the child responds to individuals in his/her microsystem will also affect how they treat the child. Supportive and nurturing interactions and relationships naturally contribute to positive development of a child.

Bronfenbrenner (1979) described mesosystem as the interactions of different microsystems such as home, school, church, etc., in which the child is growing. Mesosystem is a system of interactions between microsystems of the child. Mesosystem involves linkages between home and school, between family and friends, between church and family, etc. For example, if the parents are closely interacting and working with teachers for helping a child address learning issues and selecting classes, it will positively influence the child development and learning.

According to Bronfenbrenner (1979), exosystem comprises the linkages that exist between two or more systems, one of which may not include the child; however, that system affects him or her indirectly. Other people and places which the child may not directly interact with but may still have an effect on the child constitute the exosystem. Examples for such places and people include parents' workplace and coworkers. Parents' workplace and coworkers may not directly interact with the child. However, parents' workplace and their coworkers may have some effect on the child. For example if a coworker is telling the parent, that his/her child is a member of FFA and talks about the positive effects of FFA on his/her child, the parent who may consider talking about the FFA with his/her child and convincing the child to enroll in the school FFA program.

Macrosystem constitutes the child's cultural and value system, economic system, and political system. Macrosystem includes peoples and places distance to the child but still have a significant effect on the child. For example, if the cultural system of the child is such it appreciates agriculture, then the system will have positive effects on the child toward agriculture. The difference in values among the children growing in urban centers versus rural areas can be attributed to their differences in macrosystems. Chronosystem is comprised of change and consistency in the child's environment over a period. For example, chronosystem includes a change in family structure, living location, school, parents' employment, and societal changes that influence the child. For example, if the child lived in an urban area and moved to a farm in a rural area with his/her parents, then that will have a significant effect on the child.

### **Method**

The modified Delphi technique was used to conduct this study. Delphi technique is an exploratory research method (Clayton, 1997) and it is appropriate for exploring the barriers, challenges, and alternatives for recruiting minority students into agriculture programs. Delphi technique is a group process used to collect expert views and building consensus (Delp, Thesen, Motiwalla, & Seshadri, 1977). "It aims to guide group opinion towards a final decision and to

answer questions through triangulation of subjective group judgments, analytical techniques and the experience of the researcher” (Cantrill, Sibbald, & Buetow, 1996, p. 67).

Modified Delphi technique is a three round iterative process. The first round aims to obtain a broad range of opinions from the selected group of experts. The responses to the first round of questions, when summarized, provide the basis for the second round of questions. Summarized responses from the second round of Delphi process feed into the third and final round (Haughey, n.d.).

Delphi technique is effective in reaching consensus among the group of experts selected purposively (Stufflebeam, McCormick, Binkerhoff, & Nelson, 1985). A group of 20 agriculture teachers in the state of North Carolina were selected purposefully based on the success of recruiting minorities into their agricultural education programs. There was a diverse group of students in the agricultural education programs of the selected teachers. The study used Qualtrics survey provider to conduct three rounds of online surveys for collecting data. The first round of the study used an online questionnaire with the following four open-ended questions:

1. What do you consider as major barriers preventing minorities enroll in secondary school agricultural education programs (courses and FFA)?
2. What do you consider as real challenges when recruiting minorities into secondary school agricultural education programs?
3. What do you consider as the strategies effective in recruiting minorities into secondary school agricultural education programs?
4. If minority students are placed in your courses due to reasons such as student overflow, which strategies are effective in recruiting them into another agriculture course or FFA?

Open-ended questions were used to generate possible responses from the Delphi panel. In addition to these four questions, there were five demographic questions to describe the background of the panel members and their agricultural education programs. Five demographic questions were about number of students enrolled in the agricultural education programs, percentage of minorities in the agricultural education program, years of teaching experience, gender and ethnicity of agriculture teachers. In the first round, 12 agriculture teachers responded to the survey. Their unique responses to above four open-ended questions were identified and used to develop the second round survey. In the second round survey, panel members were asked whether they agree or disagree with the listed responses received for the first round and list or modify if any item needs to be added or modified. In the second round, six agriculture teachers of the panel responded to the survey. Most of them agreed with the items listed and few added/modified responses. The responses received for four open ended-questions in the second round were used to develop the third round online survey. All unique responses received and agreed in the second round for each of the four open-ended questions were listed under the question with a five-point Likert scale (1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, 5=Strongly Agree) for the third round survey. Eleven panel members responded to the third round survey. Descriptive statistics were used to analyze and summarize the data. The responses to *strongly agree* and *agree* categories were aggregated to determine the percentage of Delphi panel members in agreement with each item. Similar to that, responses to *strongly disagree* and *disagree* categories were aggregated to determine the percentage of Delphi panel members disagree with each item. The items having 70% or above agreed or strongly agreed rating were identified as important items with Delphi panel built consensus.

## Results and Discussion

Of the respondents, nine were White, one was African American, and two were identified as “others.” Eight of the respondents were male and four were female teachers. The respondents’ years of teaching experience ranged from four years to 45 years with the mean value of 14.4 years. The number of students in reported agricultural education programs ranged from 26 to 300 with the mean of 128. The minority presentation in these agricultural education programs ranged from 7% to 90% with the mean of 46%. The review of this background information about the responding agricultural education teachers and their programs indicates that the group comprised a mixed group of experienced teachers having a good size of agricultural education program with diverse group of students.

### Barriers to Recruit Minority Students

Barrier is described in this study as a circumstance or obstacle that prevents students’ enrollment in agriculture programs. The analysis of the third round data was used to identify barriers of recruiting minority students into agricultural education programs. Lack of parental encouragement, competition with athletic programs for time, lack of minority students’ family experience in agriculture, lack of minority students’ exposure to agriculture, and the preconceived stereotype idea of FFA and its typical membership is White were identified as the top ranking six barriers to recruit minorities into agricultural education (see Table 1). Over 80% of the Delphi panel members either agreed or strongly agreed with these six items signifying those are important barriers. The next important barriers having over 70% agreement were negative views/stigma associated with minority students toward agriculture/agriculture careers, minority students’ culture that see little or no opportunities in the agriculture sector, and friends of minority students not being enrolled in agricultural education.

Table 1

*Barriers to Recruit Minority Students into Agricultural Education Programs (n = 11)*

Barriers	Disagree or Strongly Disagree (%)	Neither (%)	Agree or Strongly Agree (%)
Lack of parental encouragement	---	9.1	91.0
Competition with athletic programs for time	---	18.2	81.8
Lack of minority students’ family experience in agriculture	9.1	9.1	81.8
Lack of minority students’ exposure to agriculture	9.1	9.1	81.8
Lack of minority students’ interests in agriculture	18.2	---	81.8
The preconceived stereotype idea of FFA and its typical membership is White	9.1	9.1	81.8
Negative views/stigma associated with minority students toward agriculture/Ag careers	---	27.3	72.8

Minority students' culture that see little or no opportunities in the Ag Sector	9.1	18.2	72.8
Friends of minority students not being enrolled in Ag Education	---	27.3	72.8

*Note.* Scale: 1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, 5=Strongly Agree

### Challenges to Recruit Minority Students

Over 80% of the panel members agreed or strongly agreed convincing minority parents buy into agricultural education programs, creating appreciation for agriculture among minority students, and breaking down cultural barriers as the three most important challenges when recruiting minority students into agricultural education (see Table 2). Of the panel members, 72.8% agreed or strongly agreed breaking down stereotype perceptions of minority students toward agricultural education programs, getting minority students interested in agricultural education programs, finding minority students that are interested in agriculture and FFA, and removing “redneck” stigma of FFA with minority students as other significant challenges they need to consider when recruiting minority students.

Table 2

*Challenges to Recruit Minority Students into Agricultural Education Programs (n = 11)*

Challenges	Disagree or Strongly Disagree (%)	Neither (%)	Agree or Strongly Agree (%)
Convincing minority parents buy in Ag Ed Programs	---	9.1	91.0
Creating appreciation for agriculture among minority students	9.1	---	90.9
Breaking down cultural barriers	---	18.2	81.8
Breaking down stereotype perceptions of minority students toward Ag Ed Programs	---	27.3	72.8
Getting minority students interested in Ag Ed Programs	9.1	18.2	72.8
Finding minority students that are interested in agriculture and FFA	9.1	18.2	72.8
Removing “redneck” stigma of FFA with minority students	9.1	18.2	72.8

*Note.* Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

### Alternatives to Recruit Minority Students into Agricultural Education

Delphi panel members unanimously agreed or strongly agreed making personal connections with potential students and students recruiting their minority friends as the best two alternatives to recruit minorities (see Table 3). Of the panel members 90.9% agreed or strongly agreed minorities recruiting minorities, showcasing exceptional minorities who have succeeded in the agriculture field, being yourself and care for your students, demonstrating student growth through leadership development, and showing minorities who are excelling in FFA as the second

most effective alternatives. The third important alternatives received between 70.7% and 81.8% agreement were demonstrating how agricultural education is different from other courses, being receptive to minorities and acting as an encourager, meeting students where they are such as sporting events, concerts, awards ceremonies, church/community functions, and making NC FFA an inclusive organization to attract minority students as shown in Table 3.

Table 3

*Alternative for Recruiting Minorities into Agricultural Education*

Alternatives	Disagree or Strongly Disagree (%)	Neither (%)	Agree or Strongly Agree (%)
Making personal connections with potential students	---	---	100
Students recruiting their minority friends	---	---	100
Minorities recruiting minorities	---	9.1	90.9
Showcasing exceptional minorities who have succeeded in the Ag field	---	9.1	90.9
Be yourself and care for your students	---	9.1	90.9
Student growth through leadership development	---	9.1	90.9
Showing minorities who are excelling in FFA	9.1	-	90.9
Demonstrating how Ag Ed is different (more hands on) from other courses	---	18.2	81.8
Be receptive to minorities and acting as an encourager	18.2	---	81.8
Meet students where they are, go to sporting events, concerts, awards ceremonies, church/community functions	18.2	9.1	72.8
Need to make [State] FFA an inclusive organization to attract minority students	9.1	18.2	72.7

*Note.* Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

**Strategies for Recruiting Minorities into Another Agriculture Course or FFA, if Minority Students are Placed in an Agriculture Course Due to Reasons Such as Student Overflow**

The Delphi panel unanimously agreed or strongly agreed buying in from friends, talking to minority students already in the program, and building teacher and student relationship as effective strategies in recruiting minorities into another agriculture course or FFA if they are placed in an agriculture course due to reasons such as student overflow (see Table 4). Creating interest in agriculture subjects, and getting them connected and involved were identified with 90.9% agreement as the second most important two strategies for recruiting minorities into another agriculture course. The third important strategies identified with 81.8% agreement were helping minority students succeed in the class they already enrolled, exploring their interests, introducing fun activities such as travel and competitions, selecting a diverse group of people

when discussing agricultural leaders as part of the class, treating minorities as other students, and taking them to non-competitive FFA events. Panel members identified with 72.7% agreement involving minority students in hands-on laboratory activities as the fourth important strategy to recruit them into another agriculture course (see Table 4).

Table 4

*Alternatives for Recruiting Minorities into another Ag. Course or FFA, if minority students are placed in your courses due to reasons such as student overflow (n=11)*

Alternatives for Recruiting Minorities into Another Ag Course	Disagree or Strongly Disagree (%)	Neither (%)	Agree or Strongly Agree (%)
Buy-in from friends	---	---	100
Talk to students	---	---	100
Building teacher and student relationship	---	---	100
Creating interest in agriculture subjects	---	9.1	90.9
Getting students connected and involved	---	9.1	90.9
Helping students succeed in class	---	18.2	81.8
Explore students' interests, culture/home life/prior experiences	9.1	9.1	81.8
Introduce travel and competitions that are fun	9.1	9.1	81.8
When discussing agricultural leaders as part of the class, select a diverse group of people to discuss	18.2	---	81.8
Treat students of diversity the same as other students and involve them in all facets of a total Ag Ed model	18.2	---	81.8
Taking students to non-competitive FFA events such as Regional Leadership Conference	18.2	---	81.8
Hands-on/laboratory activities are a major hook to keep students	9.1	18.2	72.7

*Note.* Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

### Conclusions

The study identified nine barriers that prevent the recruitment of minority students into secondary school agriculture education programs. The most important barriers preventing minority students' enrollment in agriculture education were lack of parental encouragement to enroll in agriculture education, competition with athletic programs for time, lack of minority students' family experience in agriculture, lack of minority students' exposure to agriculture, and the preconceived stereotype idea that FFA and its typical membership is White. The second most important barriers were negative stigma associated with minority students toward agriculture/agriculture careers, minority students' culture that see little or no opportunities in the agriculture sector, and friends of minority students not being enrolled in agricultural education.

The review of these identified barriers preventing minority students' enrollment in agriculture education indicates that minority students and their parents do not have adequate knowledge about the modern agriculture and agriculture-related professional careers. "Historically, minorities have participated less than Whites in agricultural careers other than as laborers" (Talbert & Larke, Jr., 1995, p.14). Their mindset and attitudes toward agriculture are based on their preconceived notion of manual hard labor work as the only agricultural career of which they are aware. Minority students and parents give priority for athletic programs over agriculture education program because they tend to consider getting to athletic programs is a way of moving to a higher earning professional athletic career. According to Beamon (2008), considerable involvement in athletic programs has negative effects on academic and career success of minority students. Unfortunately, they do not see the rare opportunity in this path. If the minority students are aware of the career opportunities and prospects available for them in agriculture, this situation could change.

Bronfenbrenner's (1979) ecological theory provides a framework for understanding identified barriers and finding solutions. The review of barriers indicates that minority students do not have much exposure to agriculture and agriculture-related careers. Their home and community environment is also not having any appreciative exposure or experience with agriculture. As Bronfenbrenner's (1979) ecological theory explains the most impactful everyday interacting microsystem of minority students – home and community- is away from the current reality of agricultural careers. Additionally, mesosystem – interactions of different microsystems- of minority students seems to have not yet connected them with agriculture. Howard (2015) found that African American parents perceive that schools do not actively engage with them other than behavior or academic issues of their children. Expanding the distance further from agriculture, macrosystem - culture and value - of minority students place higher value for athletic programs over other academic programs. When all of these combined, it is obvious that minority students grew up in an ecological system where they are disconnected from the reality of current agricultural career opportunities. If agricultural educators want to recruit minorities into agricultural education programs, it is important to link them through their microsystem, and mesosystem with the help of their own community members.

The study was able to build the consensus among the Delphi panel members for eight tasks as important challenges when recruiting minority students into agricultural education programs. The identified challenges are convincing minority parents buy into agriculture education programs, creating appreciation for agriculture among minority students, breaking down cultural barriers, breaking down stereotype perceptions of minority students toward agriculture education programs, getting minority students interested in agriculture education programs, finding minority students that are interested in agriculture, and removing "redneck" stigma of FFA with minority students. The review of these challenges clearly indicates that establishing a communication link with the minority students, their parents, and the community to make them aware of the prospects of agricultural education and related careers is the major task all of these eight challenges are centered. Bronfenbrenner's (1979) ecological theory explained this communication process as the interactions between microsystems and it is referred to as the *mesosystem*. This includes interactions between the home and school, teachers and students, etc. to engage with minority students, their parents, and community for making them aware of prospects of agriculture education.

The study identified 11 strategies useful in recruiting minority students. These alternatives are 1) making personal connections with potential students, 2) students recruiting their minority friends, 3) minority students recruiting other minority students, 4) showcasing exceptional minorities who have succeeded in the agriculture field, 5) being yourself and care for your students, 6) demonstrating student growth through leadership development, 7) showing minorities who are excelling in FFA, 8) demonstrating how agriculture education is different from other courses, 9) being receptive to minorities and acting as an encourager, 10) meeting students where they are such as sporting events, concerts, awards ceremonies, church/community functions, and 11) making NC FFA an inclusive organization to attract minority students. A critical review of these alternatives highlights that building linkages with minority students using available opportunities and already connected minorities to make them aware of the prospects of agricultural education is necessary to change their mindset and convince to enroll in agriculture education. When making linkages it is effective to use minority students already in the program to convince their friends to enroll and participate. Similarly highlighting successful minority agricultural professionals as examples is helpful in convincing minority students. For instance, Jones and Bowen (1998) reported that minorities in agriculture professions could serve as role models to help minority students overcome their negative perceptions about agriculture-related careers.

The study also identified 12 alternatives helpful in retaining the minority students into another agriculture course or FFA, if they are placed in an agriculture course due to reasons such as student overflow. The 12 strategies helpful in retaining minorities are 1) buying-in from friends, 2) talking to minority students already in the program, 3) building teacher and student relationship, 4) creating interest in agriculture subjects, 5) getting minority students connected and involved, 6) helping minority students succeed in the class they already enrolled, 7) exploring their interests, 8) introducing fun activities such as travel and competitions, 9) selecting a diverse group of people when discussing agricultural leaders as part of the class, 10) treating minorities as other students, 11) taking them to non-competitive FFA events, and 12) involving minority students in hands-on laboratory activities. The review of these alternatives indicates that linking them with others in the class and creating an environment for helping to them to gain a positive learning experience are necessary to retain them in the agriculture education program.

### **Recommendations**

Agriculture teachers should be aware of possible barriers and challenges when recruiting minority students into agricultural education programs for finding ways to overcome barriers and face challenges realistically. This study identified possible 10 barriers that agriculture teachers need to be aware of when planning to recruit minority students into agriculture education programs. Most of these barriers are associated with minorities' lack of knowledge about the prospects of agriculture-related career opportunities and misconceptions about agriculture. Therefore, it is important to use all available communication channels and public relation avenues to educate potential minority students, their parents, and the community about career opportunities available in agriculture-related professions and help them clear their misconceptions about agriculture. Strengthening school and home links and establishing a clear communication link with minority students and their parents are necessary steps to overcome barriers of recruiting minorities into agriculture education programs.

This study identified 11 alternatives useful in recruiting minority students into agricultural education programs and 12 alternatives helpful in recruiting minorities into another agriculture course or FFA if they are placed in an agriculture course due to reasons such as student overflow. These alternatives are helpful strategies to overcome barriers and address the challenges of recruiting minority students into agricultural education programs. Agricultural educators should explore available communication linkages between the school and minority communities to make potential students and their parents aware of the career opportunities and prospects of agriculture and eliminate their misconceptions about agriculture for recruiting minorities into agriculture education. Recruiting displays, websites, and handouts should be developed citing positive experiences of minorities who are successful in agriculture-related careers to educate potential minority students and their parents. Promotional materials should be made available to career counselors and administrators to convey the message to potential students and their parents. When minority students are in the program, it is important to help them get a positive learning experience and develop an appreciation for agriculture and agriculture-related careers. So that the minority students already connected with the program can be used as ambassadors to reach their community and recruit new students. For example, 28 minority secondary school students were provided an opportunity to visit Purdue University's West Lafayette campus for a program that exposed them to agricultural careers and educational opportunities (Robinson, 2015). Bringing African American secondary school students into college campus was effective in recruiting them into college of agriculture (Burns, 2006). The minority students who exposed to agriculture and developed favorable values toward agriculture-related careers can be used to recruit other minority students.

This study used a group of agriculture teachers from one state to determine barriers, challenges and alternatives when recruiting minorities into agricultural education program. This is a limitation of the study. Therefore, it is important to repeat this study with a national panel of agriculture teachers to validate the findings of this study further.

### References

- Banks, J. A. (2008). *An introduction to multicultural education*. Boston, MA: Allyn and Bacon.
- Beamon, K. K. (2008). "Used goods": Former African American college student-athletes' perception of exploitation by division I universities. *The Journal of Negro Education*, 77(4), 352-364. Retrieved from [https://www.jstor.org/stable/25608704?seq=1#metadata\\_info\\_tab\\_contents](https://www.jstor.org/stable/25608704?seq=1#metadata_info_tab_contents)
- Bowen, B. E. (2002). Advancing agricultural education within the context of an increasingly diverse society. *Journal of Agricultural Education*, 43(1), 1-11. doi:10.5032/jae.2002.01001
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Burns, M. J. (2006). *Factors influencing the college choice of African-American students admitted to the college of agriculture, food and natural resources* (Master's thesis). Retrieved from <https://mospace.umsystem.edu/xmlui/bitstream/handle/10355/4646/research.pdf?seq>

- Camp, W. G. (1995). Agricultural education in the United States: Teacher gender and ethnicity by region and state. *The Agricultural Education Magazine*, 68 (1) 22-23.
- Cano, J., & Bankston, J. (1992). Factors which influence participation and non-participation of ethnic minority youth in Ohio 4-H programs. *Journal of Agricultural Education*, 33(1), 23-29. doi:10.5032/jae.1992.01023
- Cantrill, J. A., Sibbald, B., & Buetow, S. (1996). The Delphi and nominal group techniques in health services research. *The International Journal of Pharmacy Practice*, 4, 67-74. Retrieved from <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.2042-7174.1996.tb00844.x>
- Clayton, M. J. (1997). Delphi: a technique to harness expert opinion for critical decision-making tasks in education. *Educational Psychology*, 17(4), 373-386. doi.org/10.1080/0144341970170401
- Delp, P., Thesen, A., Motiwalla, J., & Seshadri, N. (1977). *Delphi: System tools for project planning*. Columbus, OH: National Center for Research in Vocational Education, Ohio State University.
- Dyer, J. E., & Breja, L. M. (2003). Problems in recruiting students into agricultural education programs: A Delphi study of agriculture teacher perceptions. *Journal of Agricultural Education*, 44(2), 75-85. doi:10.5032/jae.203.02075
- FFA. (1999). *FFA guide to recruitment and retention*. Indianapolis, IN: National FFA Organization. Retrieved from [http://www.alabamaffa.org/Forms\\_Applications/RecruitRetentionHndbook.pdf](http://www.alabamaffa.org/Forms_Applications/RecruitRetentionHndbook.pdf)
- Haughey, D. (n.d.). Delphi technique a step-by-step guide. Retrieved from <https://www.projectsmart.co.uk/delphi-technique-a-step-by-step-guide.php>
- Howard, E. D. (2015). African American parents' perceptions of public school: African American parents' involvement in their children's educations. (Doctoral dissertations). Retrieved from <https://dc.etsu.edu/cgi/viewcontent.cgi?article=3951&context=etd>
- Jones, K. R., & Bowen, B. E. (1998). A qualitative assessment of teacher and school influences on African American enrollment in secondary agricultural science courses. *Journal of Agricultural Education*, 39(2), 19-29. doi: 10.5032/jae.1998.02019
- Ladson-Billings, G. (1994). *The dreamkeepers: Successful teaching for African American students*. San Francisco, CA: Jossey-Bass.
- Lavergne, D. D., Larke, Jr. A., Elbert, C. D., & Jones, W. A. (2011). The benefits and barriers toward diversity inclusion regarding agricultural science teachers in Texas secondary agricultural education programs. *The Journal of Agricultural Education*, 52(2), 140–150. doi:10.5032/jae.2011.02140
- Lawrence, S., Rayfield, J., Moore, L. L., & Outley, C. (2013). An analysis of FFA chapter demographics as compared to schools and communities. *Journal of Agricultural Education*, 54(1), 207-219. doi: 10.5032/jae.2013.01207

- Myres, B. E., Dyer, J. E., & Breja, L. M. (2003). Recruitment strategies and activities used by agriculture teachers. *Journal of Agricultural Education*, 44(4), 1-11. doi:10.5032/jae.2003.04094
- 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.
- Robinson, K. (2015, November). Minority high schoolers learn about ag. *Purdue Agriculture Magazine*. Retrieved from <https://ag.purdue.edu/agricultures/Pages/Fall2015/spotlight-04-Minority-Students.aspx#.W7JXrntKhhE>
- Stufflebeam, D.L., McCormick, C.H., Binkerhoff, R.O., & Nelson, C.O. (1985). *Conducting educational needs assessments*. Boston, MA: Kluwer Nijhoff Publishing.
- Talbert, B., & Larke, Jr., A. (1995). Minority students' attitudes toward agricultural careers. *NACTA Journal*, 14-17. Retrieved from [https://www.nactateachers.org/attachments/article/739/Talbert\\_NACTA\\_Journal\\_March\\_1995-3.pdf](https://www.nactateachers.org/attachments/article/739/Talbert_NACTA_Journal_March_1995-3.pdf)
- United States Census. (2016). *Quick facts*. Retrieved from <https://www.census.gov/quickfacts/fact/table/US/PST045216>
- United States Department of Education. (2016). *The state of racial diversity in the educator workforce*. U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service, Washington, D.C. Retrieved from <https://www2.ed.gov/rschstat/eval/highered/racial-diversity/state-racial-diversity-workforce.pdf>
- Warren, C. K., & Alston, A. J. (2007). An analysis of diversity inclusion in North Carolina secondary agricultural education programs. *Journal of Agricultural Education*, 2(2), 66–78. doi: 10.5032/jae.2007.02066

## Discussant Remarks

### **Barriers, Challenges, and Alternatives of Recruiting Minority Students into Secondary School Agriculture Education Programs**

Discussant: Jason Peake, University of Georgia

The authors used a Delphi study to examine 12 exemplary agriculture programs with diverse student populations in North Carolina. The authors have created a well-written manuscript that addresses a much needed problem in agricultural education and provides very practical recommendations for how agriculture teachers can maximize diversity recruitment efforts.

The literature provides a clear description of the problem, barriers, challenges, and existing recruitment strategies. I am disappointed to see that much of the research cited is fairly dated, coming from the 1990's and the first decade of the 2000's. My disappointment is not a reflection of weak efforts on the part of the authors, but instead the lack of research that addresses recruitment of minorities in agricultural education; more efforts should be extended to this topic.

The purpose of the study is clear and attempts to determine the barriers and challenges of recruiting minority students into secondary agricultural education programs and alternatives to overcome those barriers and challenges.

The use of Bronfenbrenner's ecological system theory is an interesting choice and this is a conceptual framework that I am not familiar with. The authors do a nice job making it understandable and I can easily discern the connection between this framework and their research question, however I will leave it to others who are more knowledgeable with the intricacies of Bronfenbrenner to determine if it is the best conceptual framework for this study. As a final note on the conceptual framework, thank you for bringing your use of this model full circle in the Conclusions section, really nicely done!

The use of Delphi as a research method seems appropriate to this study and it appears to have been used in a logical and appropriate manner. While the selection criteria for these participants makes sense, it is interesting to see that nine of twelve participants are white and that eight of twelve participants are male. Could the recruitment experiences for mostly male and white participants be different from minority and female participants?

An effort is made to describe the participants' programs with Means, which may have been better presented as a table with frequencies due to such wide ranges (26 to 300 students with a Mean of 128; 7% to 90% minorities with a Mean of 46%). Page limitations may have influenced the authors' decision to save space for the data that directly answered the research questions.

The results of this study are extremely well laid out, clear, easy to understand, and appropriately address the purpose of the study. Well done! The conclusions and recommendations are thoughtful and clear, thank you for a well put-together study.

## **Women Faculty in Postsecondary Agricultural and Extension Education: A Fifteen Year Update**

Lauren Lewis Cline, Oklahoma State University  
Haley Rosson, West Virginia University  
Penny Pennington Weeks, Oklahoma State University

### **Abstract**

*Women faculty membership in the American Association for Agricultural Education was 14.6% in 2003 and is now 21.9%. With strategic goals to build a more inclusive and collaborative culture within the association, the need to recruit and retain diverse faculty remains in agricultural and extension education (AEE). The purpose of this critical inquiry study was to provide an updated profile of women faculty in postsecondary AEE by describing the current organizational climate and mentoring experiences. Following basic interpretive qualitative methodology, a census of women faculty in AEE was conducted. Four emergent themes described women faculty's perceptions of the unique challenges, opportunities, and mentoring experiences in AEE: a) contributors to a positive work environment, b) contributors to a toxic work environment, c) mentoring experiences in the profession, and d) work-life integration. Women faculty valued encouragement, collaboration, transparency, and mentorship within the profession. Sexism, marginalization, and unhealthy competition were identified as barriers. Women faculty held three conflicting perceptions of work-life integration. Opportunities to create a more inclusive organizational culture with intentional mentorship for women faculty in AEE should be considered. Continued critical research to promote the inclusion of diverse faculty in AEE is recommended.*

### **Introduction and Background**

According to the United States Department of Labor (2014), a traditional, or female-dominated job, is defined as an occupation in which women represent 75% or more of the total employment. Traditionally, females have been majority status as educators. In 2013, women comprised 81% of all elementary and middle school teachers, 57% of secondary school teachers, and 50% of post-secondary teachers (U.S. Department of Labor). However, women within the agricultural education discipline, a historically male-dominated realm of education (Enns & Martin, 2015), have been significantly under-represented, particularly at the secondary and postsecondary education levels (Foster & Seevers, 2003; Kelsey, 2006b; Seevers & Foster, 2003). In 2003, Seevers and Foster reported 14.6% of the total membership in the American Association for Agricultural Education (AAAE) were women faculty. When examining the membership roster for AAAE in 2017, the percentage of female postsecondary agricultural and extension education (AEE) instructors was 21.9%.

Females represented the majority of newly qualified agricultural teachers in 2009, yet the number of active teachers of agricultural education that same year was dominated by males in a 2:1 ratio (Kantrovich, 2010). In Oklahoma, Kelsey (2006b) found that while female preservice agricultural education students were “well prepared to teach and had contextually rich experiences in [agricultural education],” (p. 117), only 3% of women represented the agricultural education teaching force in the state. This discrepancy in the number of females graduating as

newly qualified agricultural teachers versus the number of females actually teaching within the profession is cause for concern.

The inclusion of females into the predominantly male oriented realm of agricultural education has uncovered multiple barriers related to gender (Enns & Martin, 2015), not unlike the experiences of women pursuing careers in other traditionally male-dominated fields (Baxter, Stephens, & Thayer-Bacon, 2011). Foster (2001b, 2003) identified three challenges or barriers experienced by female secondary agricultural education instructors related to acceptance by peers and other males within the agricultural industry, acceptance by administrators, and balancing family and career. Additionally, many female agricultural education teachers have faced criticisms from colleagues and administrators, sexual discrimination and bias, and inequity in terms of professional status and benefits (Baxter et al., 2011; Kelsey, 2006b, 2007; Seevers & Foster, 2003). Many women also believe they must work harder than their male counterparts in order to prove their competence in agriculturally-related subject matter and have often been overlooked as the point of authority (Seevers & Foster, 2003).

An additional factor attributed to women's late entrance into the field of agricultural education is a lack of strong female role models to advocate for advancement to higher educational levels (Enns & Martin, 2015; Seevers & Foster, 2003). Foster and Seevers (2003) reported that while women in AEE appear happy and committed to their role within the profession when properly encouraged, the presence of mentoring and/or support networks is too few. Hall and Sandler (1982) echo this sentiment by stating that many women pursuing studies in a more male-dominated major are likely to face difficulties, owing to a lack of female teachers to serve as role models, as well as having professors who may be less accustomed to having female students in their classes.

Recent studies focused on the factors attributing to success for female leaders and tenured faculty in AEE (Kleihauer, Stephens, Hart, & Stripling, 2013; Murphrey, Odom, McKee, & Wilkens, 2016). However, a complete profile of all women faculty in postsecondary AEE has not been updated for over fifteen years (Foster & Seevers, 2003; Seevers & Foster, 2003). Although the profession has seen a slight increase in gender diversity, the experiences of women faculty currently in AEE at the university level need to be considered to ensure retention and inclusion.

### **Purpose**

The purpose of this study was to update the profile of women faculty in postsecondary agricultural and extension education (AEE) by describing the current organizational climate and mentoring experiences for women in the profession. The study was conducted as a follow-up to two studies focused on women faculty in AEE published fifteen years previously (Foster & Seevers, 2003; Seevers & Foster, 2003). Two research questions guided this study:

1. What are the perceptions of women faculty regarding the unique challenges and opportunities in agricultural and extension education?
2. How do women faculty in agricultural and extension education describe their mentoring experiences?

### **Epistemological and Theoretical Perspective**

This study was conducted from the epistemological perspective of constructionism, which views “all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context” (Crotty, 1998, p. 42). Meaning as it relates to our research questions was created through the collective experiences of the individual participants. Women experiences in secondary and postsecondary AEE have been studied from a variety of perspectives (Baxter et al., 2011; Foster, 2011a; Kelsey, 2006a; Kleihauer, Stephens, Hart, & Stripling, 2013; Murphrey, Odom, McKee, & Wilkens, 2016; Stephens, Brawner, Dean, Stripling, & Sanok, 2017), suggesting ideological forces of power among genders as influential. Critical inquiry as a theoretical perspective aims to identify power dynamics and critique and transform predominate social beliefs, practices, and institutions (Kincheloe, McLaren, Steinberg, & Monzó, 2018; Patton, 2015). This study was approached from a critical inquiry theoretical perspective to critically evaluate the lived experiences of women faculty in agricultural and extension education (Patton, 2015). The interpretations of women faculty in AEE were essential to the problem being studied.

### **Methods**

To provide an updated profile of women faculty in AEE, an attempt was made to follow the original survey research protocol outlined by the studies of Fosters and Seevers (2003; Seevers & Foster, 2003). The original questionnaire was obtained and adapted for electronic administration through the Qualtrics survey platform. Five sections related to a) educational and professional background, b) current professional status, c) mentoring, e) professional treatment, and f) demographics comprised the questionnaire. Each section included Likert-type and open-ended questions. Face and content validity were assessed by a panel of experts, which included female and male faculty members in AEE from multiple universities. Minor changes to the wording of some questions were made to increase relevancy and meaningfulness (e.g., adding agricultural communication as a possible course type for selection although it was not included in the original instrument). This study centers on the responses to 10 open-ended questions in the mentoring and professional treatment sections using qualitative analysis; therefore, instrument reliability is not addressed.

Basic interpretive qualitative methodology (Merriam, 2002) was followed to identify the common themes and patterns to describe the perceptions of women faculty. 726 responses to the open-ended questions were compiled and analyzed independently by the researchers. Concept codes were used as the first cycle coding method to reflect the broader social constructs in the data (Saldaña, 2016). “Concept Coding is appropriate for all types of data [and] studies with multiple participants . . . to transcend the particular participants of your fieldwork and to progress toward the ideas suggested by the study” (Saldaña, 2016, p. 120). Concept coding is also found of value to studies in critical theory (Saldaña, 2016). To prepare for second cycle coding, the researchers used code mapping to compare initial concept codes, enabling categories to emerge by “comparing and sorting . . . to determine which ones seem to go together . . . and potentially transform your codes first into organized categories, and then into higher-level concepts” (Saldaña, 2016, pp. 220-222). Analysis of the emerging five main categories and 11 sub-categories from the first and transitional coding cycles resulted in four axial codes with 15 properties and dimensions. Saldaña (2016) describes the axial coding method as an aim to show the relationship between categories and subcategories by specifying the “properties (i.e., characteristics or attributes) and dimensions (the location of a property along a continuum or

range) of a category” (p. 244). Analytic memos were kept during interpretation and reflected upon by the researchers to guide the systematic linking of categories, properties, and dimensions (Saldaña, 2016). Trustworthiness was maintained in this critical inquiry study by analyzing the positionality of truth and maintaining member’s voice. Recognizing one participant’s truth may not represent the truth of another (Lincoln, 1995), we made sure to feature differing views among the women faculty.

## **Participants**

The population for this study consisted of all women faculty members in agricultural and extension education programs. An initial list of 125 women faculty was obtained from the 2017 American Association of Agricultural Education (AAAE) member directory (21.9% of the total membership). A search of university websites listed by AAAE as having an agricultural education, communication, extension, leadership or similar program identified an additional 66 women faculty in agricultural education, extension, communications, and leadership not included in the AAAE membership. Inclusion of AAAE and non-AAAE members from agricultural education, extension, communications, and leadership as participants was deemed important in order to conduct a census ( $N = 191$ ) of women faculty representing the breadth of agricultural education programs in higher education (Barrick, 1993; Mannebach, 1990; Newcomb, 1993). Six women (3.1%) chose not to participate in the study. It was determined *a priori* to remove questionnaires less than 50% completed, resulting in nine (4.7%) women’s responses removed from the study. An initial response rate of 55.5% ( $n = 106$ ) was achieved. Non-respondents were contacted by phone to solicit completion of the questionnaire. An additional eight women (11.4% of the non-respondents) completed the questionnaire. Differences between early and late respondents were not detected (Lindner, Murphy, & Briers, 2001). An overall response rate of 59.7% ( $n = 114$ ) was reached.

In describing the study’s participants, most women were assistant (31.6%,  $n = 36$ ), associate (19.3%,  $n = 22$ ), or full (14.9%,  $n = 17$ ) tenure-track faculty. Twelve percent of the women ( $n = 14$ ) were Extension educators or specialists. The remaining women identified their current university position as instructor or lecturer (18.4%,  $n = 21$ ). Ninety-two participants self-identified as members of AAAE, representing 73.6% of the women membership for the year 2017.

## **Statement of Subjectivity**

Qualitative inquiry implies subjectivity during the research process (Peshkin, 1988). Through the exercise of reflexivity, we wish to acknowledge and consider the influence of our biases in the research process to “escape the thwarting biases that subjectivity engenders, while attaining the singular perspective its special persuasions promise” (Peshkin, 1988, p. 21). As female faculty and instructors in agricultural leadership, we all have personal experience in AEE at the university level. It is because of our personal experiences and commitment to inclusion in the profession that this line of inquiry was pursued. Collectively, we have experienced both positive and toxic workplace cultures, gender-based microaggressions, and mentorship relationships of varying quality within our profession. Additionally, we acknowledge the *#MeToo* and *Time’s Up* women empowerment movements that have arose in society since early 2017. We recognize these experiences influence the lens through which we approach interpretation of the data in this study. As such, steps were taken to mitigate biases before, during, and after data collection and interpretation. Biases were noted, discussed, and challenged

to ensure data interpretation was conducted from as neutral of a standpoint as possible. We believe the findings for this study fully reflect the perceptions and experiences of the AEE women faculty participants.

### Limitations

Qualitative research does not permit replication or generalization of findings (Patton, 2015). Although this study replicated the data collection methods of previous studies (Foster & Seevers, 2003; Seevers & Foster, 2003), responses to the open-ended questions do not provide enough contextual information to form generalities. The lack of contextual understanding behind the reported data in Fosters and Seevers (2003) and Seevers and Foster (2003) did not permit a cross comparison with the findings of our study. A limitation to this study is the ability to only describe and interpret the current perceptions of women faculty, rather than identify change and progression in perceptions through a cross-comparative analysis. A constraint in resources and the desire to include as many women faculty viewpoints in the study as possible prevented us from conducting one-on-one interviews or focus groups on the study’s topic. It is also noted that while the questionnaire was administered as a census among women faculty in AEE, the entire population did not respond. Therefore, findings of this study cannot be generalized to the entire population of women faculty members in AEE. Readers are encouraged to assess the findings to determine transferability within their context.

### Findings

Analysis of the emerging main categories and subcategories from the first and transitional data coding cycles resulted in four axial codes with 15 properties and dimensions to describe perceptions of the unique challenges, opportunities, and mentoring experiences of women faculty in agricultural extension education. Figure 1 represents the four axial codes and relative properties and dimensions. Direct quotes from the data are provided to support the emergent themes, with participant names and potential identifiable information omitted to maintain confidentiality.

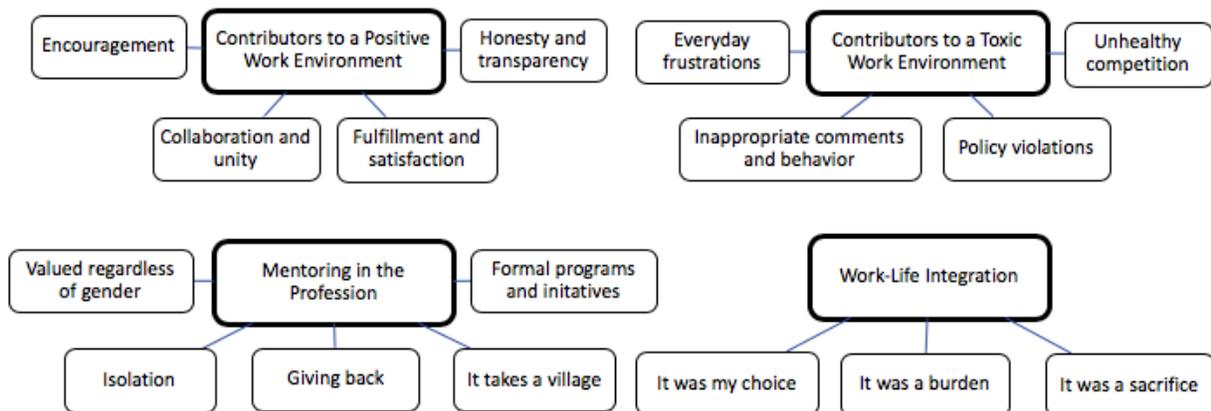


Figure 1. Five emergent axial codes and their related categories describe the unique challenges, opportunities, and mentoring experiences of women faculty in AEE as contributors to a positive

*work environment, contributors to a toxic work environment, mentoring in the profession, and work-life integration.*

### **Contributors to a Positive Work Environment**

A major theme to emerge from the participant's experiences as a female faculty member in AEE were a variety of contributing factors that supported a positive work environment and profession. Four related categories described as *encouragement, collaboration and unity, fulfillment and satisfaction, and honesty and transparency* distinguished positive work environments.

The women in this study spoke frequently of the importance of encouragement toward other female faculty in AEE. Encouragement often came in many forms, such as *"congratulations emails and letters, call, texts and messages on social media."* Encouragement was also sought and received for decisions related to their career, education, and personal life. For some women, *"daily encouragement needed as emotional support," "affirmation that I was/am on the right path," "being told to be who I am and stand up for what is right,"* and *"access to opportunities to learn about administrative openings that would allow me to advance in the organization"* contributed to their positive outlook toward the profession. The impact of past encouragement and need for continued encouragement for women faculty in AEE was summarized by one participant when they wrote,

*I have encouraged women to be involved in the development of programs related to leadership and to mentor other women. Our conceptualization[s] of leadership have changed a great deal over the years and are more welcoming to women. However, in our field, change is slow. We need more female role models to show young women that we belong in the profession and that we have important contributions to make.*

Collaboration and unity among faculty in the profession was also described as contributor to a positive work environment. One participant highlighted that *"most of my coworkers, whether male or female, have a sense of unity."* *"If we are lifting others up, it creates a positive work environment and sense of community within the profession,"* another participant commented.

The pursuit of a career that provided fulfillment and satisfaction contributed to a positive work environment for women faculty in AEE as well. *"I get to do what I love; everyone should do that,"* stated one participant. Another participant reflected, *"I love my job. Waking up and getting to come to work brings me so much joy. Working with students and helping them achieve their dreams and potential is all I could really ask for."* Other participants referenced getting to do something in their career that made a positive difference while utilizing the best of their skill set. Another participant discussed their experience in AEE as *"the most rewarding work I've ever experienced."*

Honesty and transparency were highly valued contributors to a positive work environment among the women faculty in AEE. Although honest and transparent encouragement could unintentionally discourage other women faculty, the participants felt a responsibility to represent the profession authentically. One participant's statement summarized this sentiment well:

*I would not say anyone has ever intentionally discouraged me in anything, but believe this is part of the give and take of working with others. There are times I need to be*

*encouraged and discouraged - I want people to interact with me honestly in order to provide personal and professional improvement of myself or my work.*

### **Contributors to a Toxic Work Environment**

The second theme to emerge from the participants' responses identified significant contributors to a toxic work environment for women faculty in AEE. *Everyday frustrations, unhealthy competition, inappropriate comments and behavior, and policy violations* were described. Some participants recalled sexist comments and behavior that created uncomfortable situations. Others referenced gender stereotypes and derogatory comments toward perceived career and family roles made by colleagues, such as, *"I was told by a male colleague that my real impact wouldn't be at work with my students, but would be at home with my own kids, and that's where I should be spending my time and effort."*

Women faculty perceived being overlooked for leadership positions, questioned on the quality of their work, not listened to, excluded, and marginalized in the workplace. These events described a set of everyday frustrations experienced by some of the women. For one participant, she was discouraged by her perception of *"men's indirect comments and disinterest in diversifying who is a part of the field."* Another participant felt discouragement when attending AEE conferences because they *"see male faculty grouping together with other male faculty and (whether purposefully or not) excluding female faculty."* Occurrences of subtle sexism in the workplace were mentioned as inevitable, but as one participant communicated, she tries *"not to worry about that and continue to do my best."*

Discouraging behavior was attributed to both males and females in the workplace. As one participant explained,

*There is conflict in any workplace, and higher education sometimes has a little more than the average. There have been times where some of my coworkers lose sight of the main goal . . . When they lose sight of the goal and are only in it for themselves, it is easier for them to discourage those around them.*

Madeleine Albright's (2006) quote, *"there's a special place in hell for women who don't help each other"* was referenced by multiple participants. Participants desired to create an inclusive work environment for all faculty members, but felt the level of competition among colleagues was unhealthy.

*I do not want to work in the same type of cut-throat environment I encountered during my PhD program where women tore each other down. Nor do I want to create that environment for women coming in behind me. We gain so much more when we work together, support each other, and build inclusive networks of professionals.*

Recounted experiences of some participants revealed policy violations based on gender. *"I was in the middle of interviewing for a tenure-track role and asked illegal questions. The fact a male superior to me asked them, I felt obligated to answer,"* said one participant. *"I have been asked illegal questions about pregnancy in university interviews and then been told those questions had nothing to do with the decision not to hire me for a particular role,"* another participant responded. While not all participants described hostile workplace cultures, the following quotes evidence the visceral experiences of a significant portion of the women faculty:

*As a first-semester graduate student, a faculty member in the agriculture program told me that I had ‘no business being in graduate school, that I would never get a job in the industry, and that I should be a nurse because it was an appropriate job for a woman.’ When I tried to argue, he told me to talk to his daughter, a nurse. He also expressed concern that I was not married already, saying it was his opinion that ‘women needed to be serviced at least twice per week in order to be able to think properly.’ That is a direct quote, because I have never forgotten it. He used the word ‘serviced,’ like the service for a stallion or bull.*

*One male told me I needed to wear different clothing because my (he pointed to his chest) ‘these’ made him uncomfortable. I’ve been called beautiful more times than I was called smart more frequently than I cared to admit. It was always assumed I was the graduate student or the secretary rather than the professor, especially if a male was present. I’ve sat through countless meetings where I had an idea (that I voiced), which went ignored until a man voiced nearly the same idea and it was considered brilliant. The list goes on.*

*I experienced many issues with under-cutting and marginalization of women - by both male and female faculty members. I have yet to pinpoint why this occurs, but at times it was painful and counterproductive . . . The hard realities I experienced made it difficult for me to see myself in a faculty position. However, I found that this toxic type of environment is not the case everywhere and quite the opposite at my current institution.*

### **Mentoring in the Profession**

The third theme to emerge from the data described mentoring experiences in the profession for women faculty in AEE. Mentors were *valued regardless of gender*, with most universities providing *formal mentoring programs*. For a small group of women faculty, where formal mentoring opportunities were not present, a sense of *isolation* in AEE was perceived. The belief in the need to mentor because *it takes a village* to achieve success and to *give back* were common among the participants.

Mentorship was viewed as invaluable to women pursuing faculty positions in AEE. “*I believe mentoring is extremely important to retaining women in the field of agriculture and by encouraging women to be engaged in the university is one way to keep them at the university,*” a participant replied. Another participant included:

*Colleagues of both sexes have provided direction, quality education, advisement, nurturance, support, mentorship, and modeled professional practices that have positively influenced my professional attitudes, practices, and ongoing activities that do the same for colleagues, students, community leaders, volunteers, and youth.*

The structure of mentoring relationships varied among the participants but were mostly formal in nature. University mentoring programs were described as professional development programs, interdepartmental initiatives, and mandatory new faculty programs. Some university programs strived to connect female faculty and staff with resources specifically designed for women. Where formal mentoring programs lacked, participants described their experiences as an “*informal gathering of women to share experiences, concerns and professional needs.*” Yet, some participants still felt a sense of isolation and were unable to identify a mentor in AEE.

Success in AEE for women faculty was largely attributed to the quality of mentorship they had or had not received. For the majority of participants, the phrase *it takes a village* described the contribution of mentors to professional careers in AEE. A participant with established tenure proclaimed,

*I have benefitted from a variety of mentors and friends. People had already walked the path I chose and people who walked by my side down this career path. I do not believe I would have survived, let alone achieved any success at all without their help . . . Truly this has not been a path I walked alone.*

The desire to serve as mentors to other women faculty in AEE was seen as an opportunity to give back in the profession. One senior participant wished to invest in new AEE faculty as “*a means of giving back for all of the encouragement [they] received as an early career professional.*” Another senior participant explained, “*I have had the benefit of excellent mentors, both men and women, who have provided direction and opportunities in my career. I highly believe in paying those experiences forward.*”

### **Work-Life Integration**

The fourth significant theme to emerge in the study centered on work-life integration as a challenge for women faculty in AEE. Work-life integration discussions included the allocation of time and resources related to work responsibilities, family, recreation, well-being, and relationships. Three related categories, *it was my choice*, *it was a burden*, and *it was a sacrifice*, described the participants’ conflicting perceptions of work-life integration concerns.

For one group of participants, concerns associated with work-life integration were a non-issue. For this group, the goal to pursue a faculty track in AEE was a personal choice and worth the demands and perceived sacrifices of the career. “*I think we all sacrifice to move forward in our careers,*” said a participant. Attitudes like “*this is part of life!*” and “*I did what I wanted to do and I would do it again,*” were shared among this group. Any sacrifices as a result of their career were viewed as gifts to serve students and an example for young people to pursue their passions.

*Though I am away from my child a few weeks each year, I am proud that he gets to hear about what I do as a professional woman. Those times away do make me miss my son, but it also recharges me professionally and nurtures that part of me. I think if I wasn’t as involved in my career I would not be as happy overall.*

*I’m sure I have made some choices that some would say were personal sacrifices (e.g., I put off having a family until after graduation and getting a job), but they were my choices and I never felt like I sacrificed anything that was really important to me. I have always done what I thought was best for me, for my family, etc...no matter what mentors, society, or whoever else has tried to impose.*

Feelings toward work-life integration led a second group of participants to describe their experience as women faculty in AEE as burdensome. Time away from family or work were heavy loads to balance and required a strong support system. One participant said,

*I have worked on average at least 60-80 hours per week over the past 11 years in higher education. It has been incredibly hard to climb the administrative ladder and be a wife*

*and mother . . . My husband is in higher education and his encouragement and support have led largely to the success I have felt.*

The perceived expectation to be “*twice as good*” resulted in many participants forgoing their personal needs and well-being to spend more time at work and not neglect family or personal responsibilities. However, the burdens were giving way to balance. “*I do not feel I have been the mate, mother and daughter I had hoped I would be. Travel, timelines and day-to-day demands have driven me too much. Maturity has brought balance to me,*” a participant stated. “*Everything is related to balance. In the end, you realize that the sacrifices are worth it and eventually you learn to balance work, family, organizations, etc.,*” explained another participant in this group.

The remaining group of participants perceived work-life integration as the greatest barrier for women faculty in AEE. Upon reflection, the participants felt the choices in their career required sacrifice of personal and family lives. The demands of promotion and tenure led some women faculty to delay having a family, as told by one participant, “*I waited a LONG time to have a child and even then questioned if it was the ‘right’ time with tenure and promotion. I am now divorced and have to juggle a lot of roles as a single parent.*” Another participant explained her decision to forgo having children as a result of the tenure process by saying, “*I did not really want children that badly but made a decision either tenure or kids, and I chose tenure. Too hard to do both.*” Retrospectively, some participants questioned whether the sacrifices made for their career as an AEE faculty member were justified:

*I am not married, nor do I have children. Those were decisions I made early on--but, by making those decisions, I could prioritize work over family and I did for many years. I now realize that I should have tried to achieve more of a balance. Both of my parents passed away and I realized I should have spent more time going home for holidays, etc., then doing more work.*

*My professional achievement is unquestionable. The long hours, evenings, weekends, and dedication to my career affected work-life balance and my ability to have much of a personal life. Divorced and no children. Is it because of my career? I can't say so unequivocally, but it was likely a significant factor.*

When asked if they would make the same sacrifices again, one participant replied, “*Sometimes I think ‘Yes, I would do it all over.’ Other times the answer is ‘No, the price is too great.’*”

### **Conclusions, Discussion, and Implications**

In synthesizing the findings through a critical lens, the complexity of the participants’ experiences described in this study are acknowledged. No experience of any two participants were alike and perceptions varied in the degree contributors to a positive work environment, contributors to a toxic work environment, mentoring in the profession, and work-life integration were described. Overall encouragement and satisfaction experienced in the profession by women faculty did not negate toxic workplace behavior and concerns for work-life integration in AEE. The concept of gendered organizations (Ackers, 2012) helps us understand the complexity of women faculty’s experiences in AEE. Ackers (2012) identifies several substructures and subtexts of gender, “often-invisible processes in the ordinary lives of organizations” (p. 215) that influence assumptions about gender within organizations. *Organizational culture*, defined by

Ackers (2012) as “the sum of particular, often time and place specific, images, attitudes, beliefs, behaviors and values” (p. 216), *interactions on the job*, or the person-to-person interactions contributing to perceived levels of power, and *gendered identities* assist in developing a complex analysis.

As outlined in the *2017-2020 Strategic Plan*, AAAE (2017) seeks to build a more inclusive and collaborative culture within the association. Encouragement, collaboration and unity, fulfillment and satisfaction, and honesty and transparency were indicators of positive work environment attitudes and organizational culture for some of the participants in this study. Not unlike the women faculty from Fosters and Seevers (2003), women faculty in AEE appear to be happy and committed to their role within the profession when properly encouraged.

Yet, behaviors described as everyday frustrations, unhealthy competition, inappropriate interactions, and policy violations contributed to a toxic work environment for other AEE women faculty. “Whether it is exploitative or consensual, just joking or harassing, sexuality is a clear confirmation of gender difference that complicates efforts to achieve gender equality” (Acker, 2012, p. 216). Sexist interactions among colleagues and perceived gendered identities favoring masculine management styles were very real for some participants and were reflected in their responses. Society's current *#MeToo* and *Time's Up* movements addressing sexual misconduct, workplace safety and equity, and the empowerment of women (Langone, 2018) were mentioned by participants, which may explain why these lived experiences were more readily shared in this study as compared to previous research (Baxter et al., 2011; Foster, 2011a; Kelsey, 2006a; Kleihauer et al., 2013; Murphrey et al., 2016; Stephens et al., 2017). The variability in the women faculty's description of the AEE work environment should challenge the profession to critically assess predominant attitudes, behaviors, and beliefs. Training to help faculty recognize implicit gender bias and fair hiring practices will contribute to a more inclusive profession in the future.

The importance and need for mentoring among women faculty in AEE has not decreased. The AEE profession should continue to encourage formal mentoring programs, whether through AAAE or at the university/departmental levels. It is also valuable for a culture of informal mentoring to be fostered. Paralleling efforts to promote collaboration, participation in AAAE is an opportunity for women faculty in the profession to connect and learn from each other to build leadership capacity. With work-life integration emerging as a theme in this study, informal network supports among women faculty may help redefine the ideological domains of work and home (Acker, 2012) for the AEE profession, as others have alluded (Foster & Seevers, 2003; Kleihauer et al., 2013; Murphrey et al., 2016).

### **Recommendations for Future Research**

The organizational culture and climate of the AEE profession should continue to be studied. This particular study was conducted by qualitatively analyzing women faculty's responses to open-ended questions through a web-based questionnaire, which limits the contextual understanding of our findings. In-depth interviews with women faculty members in AEE are suggested to provide a more rich understanding of individual experiences in the profession. A review of literature involving women AEE faculty should be conducted and findings compared to consider the research's impact on organizational climate in the profession. With many women faculty referencing experiences from their graduate work in this study, investigating the experiences of female graduate students in AEE may provide further insight

into the underrepresentation of women faculty at the postsecondary level. It is also the sentiment of many participants in this study, and thus our research team as well, that some experiences in the AEE profession (i.e., work-life integration, contributors to toxic work environments, mentoring) may not differ among genders. Future studies should investigate the lived experiences of male faculty in AEE as well to provide both a comparative and holistic snapshot of the state of the profession.

## References

- Acker, J. (2012). Gendered organizations and intersectionality: problems and possibilities. *Equality, Diversity and Inclusion: An International Journal*, 31(3), 214-224. doi: 10.1108/02610151211209072
- Albright, M. (2006, July). WNBA Celebrating Inspiration Luncheon keynote speech. *ESPN*, 22. Retrieved from [http://www.espn.com/wnba/columns/story?columnist=voepel\\_mechelle&id=2517642](http://www.espn.com/wnba/columns/story?columnist=voepel_mechelle&id=2517642)
- American Association for Agricultural Education. (2017, May). *2017-2020 AAAE Strategic plan*. Retrieved from [https://docs.google.com/document/d/1ti\\_06TdzevNVuEHP1T\\_KZMPK0QROVrm-C2GJvC4NYOU/edit](https://docs.google.com/document/d/1ti_06TdzevNVuEHP1T_KZMPK0QROVrm-C2GJvC4NYOU/edit)
- Barrick, R. K. (1993). A conceptual model for a program of agricultural education in colleges and universities. *Journal of Agricultural Education*, 34(3), 10-16. doi:10.5032/jae.1993.03010
- Baxter, L., Stephens, C. A., & Thayer-Bacon, B. J. (2011). Perceptions and barriers of four female agricultural educators across generations: A qualitative study. *Journal of Agricultural Education*, 52(4), 13-23. doi:10.5032/jae.2011.04013
- Crotty, M. (1998). *The foundations of social research: Meanings and perspective in the research process*. Thousand Oaks, CA: SAGE Publications.
- Enns, K. J., & Martin, M. J. (2015). Gendering agricultural education: A study of historical pictures of women in the Agricultural Education Magazine. *Journal of Agricultural Education*, 56(3), 69-89. doi:10.5032/jae.2015.03069
- Foster, B. B. (2001a). Choices: A dilemma of women agricultural education teachers. *Journal of Agricultural Education*, 42(3), 1-10. doi:10.5032/jae.2001.03001
- Foster, B. (2001b). *Women in agricultural education: Who are you?* Paper presented at the 28<sup>th</sup> National Agricultural Education Research Meeting, New Orleans, LA. Retrieved from [https://www.researchgate.net/profile/Billye\\_Foster/publication/253600663\\_Women\\_In\\_Agricultural\\_Education\\_Who\\_Are\\_You/links/544961480cf2f63880829a49/Women-In-Agricultural-Education-Who-Are-You.pdf](https://www.researchgate.net/profile/Billye_Foster/publication/253600663_Women_In_Agricultural_Education_Who_Are_You/links/544961480cf2f63880829a49/Women-In-Agricultural-Education-Who-Are-You.pdf)
- Foster, B. (2003). Profiling female teachers of agricultural education at the secondary level. *Journal of Career and Technical Education*, 19(2), 15-27. Retrieved from <https://files.eric.ed.gov/fulltext/EJ675783.pdf>

- Foster, B., & Seevers, B. (2003). University women in agricultural and extension education: Committed to the profession and seeking solutions to challenges. *Journal of Agricultural Education*, 44(1), 31-42. doi:10.5032/jae.2003.01031
- Hall, R. M., & Sandler, B. R. (1982). *The classroom climate: A chilly one for women?* Retrieved from <https://files.eric.ed.gov/fulltext/ED215628.pdf>
- Kantrovich, A. J. (2010). The 36<sup>th</sup> volume of a national study of the supply and demand for teachers of agricultural education 2006-2009. *American Association for Agricultural Education*. Retrieved from <https://www.naae.org/teachag/2010%20AAAE%20Supply%20Demand%20Study.pdf>
- Kelsey, K. D. (2006a). A case study of women's experiences in a preservice teacher preparation program. *Journal of Agricultural Education*, 47(4), 123-133. doi:10.5032/jae.2006.04123
- Kelsey, K. D. (2006b). Teacher attrition among women in secondary agricultural education. *Journal of Agricultural Education*, 47(3), 117-129. doi:10.5032/jae.2006.03117
- Kelsey, K. D. (2007). Overcoming gender bias with self-efficacy: A case study of women agricultural education teachers and preservice students. *Journal of Agricultural Education*, 48(1), 52-63. doi:10.5032/jae.2007.01052
- Kincheloe, J. L., McLaren, P., Steinberg, S. R., & Monzó, L. D. (2018). Critical pedagogy and qualitative research: Advancing the bricolage. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (5th ed.) (pp. 235-260). Thousand Oaks, CA: SAGE Publications.
- Kleihauer, S., Stephens, C. A., Hart, W. E., & Stripling, C. T. (2013). How six women deans of agriculture have attained their leadership role: A qualitative study. *Journal of Agricultural Education*, 54(3), 15-27. doi:10.5032/jae.2013.03015
- Langone, A. (2018, March 8). #MeToo and Time's Up founders explain the difference between the 2 movements - and how they're alike. *Time Magazine*. Retrieved from <http://time.com/5189945/whats-the-difference-between-the-metoo-and-times-up-movements/>
- Lincoln, Y. S. (1995). Emerging criteria for quality in qualitative and interpretive research. *Qualitative Inquiry*, 1(3), 275-289. doi:10.1177/107780049500100301
- Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53. doi:10.5032/jae.2001.04043
- Mannebach, A. J. (1990). A vision and a mission for agricultural education. *The Agricultural Education Magazine*, 62(7), 4-5. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume62/v62i7.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume62/v62i7.pdf)
- Merriam, S. B., et al. (2002). *Qualitative research in practice: Examples for discussion and analysis*. San Francisco, CA: Jossey-Bass.

- Murphrey, T. P., Odom, S. F., McKee, V., & Wilkens, C. C. (2016). A qualitative examination of success factors for tenure-track women faculty in postsecondary agricultural education. *Journal of Agricultural Education, 57*(4), 54-67. doi:10.5032/jae.2016.04054
- Newcomb, L. H. (1993). Transforming university programs of agricultural education. *Journal of Agricultural Education, 34*(1), 1-10. doi:10.5032/jae.1993.01001
- Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Thousand Oaks, CA: SAGE Publications.
- Peshkin, A. (1988). In search of subjectivity - one's own. *Educational Researcher, 17*(7), 17-21. Retrieved from <http://www.jstor.org/stable/1174381>
- Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Thousand Oaks, CA: SAGE Publications.
- Seevers, B. & Foster, B. B. (2003). Women in agricultural and extension education: A minority report. *NACTA Journal, 47*(1), 32-37. Retrieved from [https://www.nactateachers.org/attachments/article/516/Seevers\\_and\\_Foster\\_Mar03Journal.pdf](https://www.nactateachers.org/attachments/article/516/Seevers_and_Foster_Mar03Journal.pdf)
- Stephens, C. A., Brawner, S., Dean, A., Stripling, C. T., & Sanok, D. (2017). Reflective journeys of five women agriculturalists in Australia: A qualitative study. *Journal of Agricultural Education, 59*(1), 271-286. doi:10.5032/jae.2018.01271
- United States Department of Labor: Women's Bureau. (2013). *Leading occupations*. Retrieved from <https://www.dol.gov/wb/stats/leadoccupations.htm>
- United States Department of Labor: Women's Bureau. (2014). *Non-traditional (male-dominated) occupations, 2014 annual averages*. Retrieved from <https://www.dol.gov/wb/stats/Nontraditional%20Occupations.pdf>

## **Discussant Remarks**

### **Women Faculty in Postsecondary Agricultural and Extension Education: A Fifteen Year Update**

Jason Peake, University of Georgia

The authors provide an updated profile of women faculty in postsecondary agricultural and extension education by updating and duplicating a study by Fosters and Seevers in 2003. Overall this study is well written, thoughtful, and badly needed in the profession.

In the introduction the authors report “Females represented the majority of newly qualified agricultural teachers in 2009, yet the number of active teachers of agricultural education that same year was dominated by males in a 2:1 ratio (Kantrovich, 2010)”. This compares the majority female newly qualified teachers of 2009 with the majority male “active teachers” for that same year... I am curious as to the comparison between the majority female newly qualified teachers of 2009 with the number of male newly qualified teacher of 2009. The authors go on to build a strong justification for this study.

The purpose of this study was to update the profile of women faculty in postsecondary agricultural and extension education (AEE) by describing the current organizational climate and mentoring experiences for women in the profession. The purpose is clear, well written, in line with the National Research Agenda, and a clear need for the profession.

The epistemological perspective of constructionism and critical inquiry theoretical perspective were used as the underpinning of this study and seems like an appropriate choice. I am not qualified enough in qualitative research to assess if this is the best epistemological and theoretical perspective, I will leave that for more qualified researchers.

Basic interpretive qualitative methodology was used. I appreciate the authors effort to update the instrument and follow Foster and Seevers as much as possible. The authors correctly point out that there is not enough contextual information for them to make a comparison to Foster and Seevers. Our profession does not often use qualitative paradigm for longitudinal research, however in this case, it is very insightful and beneficial for the profession. Thank you and well done!

Great effort to reach out to all women faculty members in agricultural and extension education programs. It appears the authors did everything possible to reach the 191 women in the profession and then more than due diligence to reach out to non-responders to achieve a final n=114. A response rate of 59.7% was achieved.

The findings were well thought out and clearly communicated. One finding that is of interest to me is the variability in the women faculty’s description of the AEE work environment. I am curious if the authors believe what causes this variability... is it the work environment of the participant’s home institution, is it the participant’s perception of the work environment, or something else that may be systemic of the profession. Whatever the issue it is certainly worthy of the professions time and attention to address these issues.

# **Empowering Underrepresented Populations in STEM: Experiences of Agricultural Education Majors During a Service-Learning Project**

Richie Roberts, Louisiana State University  
Chastity Warren English, North Carolina A&T State University  
Antoine J. Alston, North Carolina A&T State University

## **Abstract**

*In recent decades, concerns have mounted that the United States' economic advantage might dissolve if interest and skill development in science, technology, engineering, and mathematics (STEM) remains neglected in education. Given this historical and societal context, SL has flourished as a pedagogy calibrated to address such concerns. Therefore, this case study sought to understand how agricultural education students experienced empowerment in STEM as they engaged with underrepresented populations during a semester-long, SL project. To understand emergent findings, we used Zimmerman's empowerment theory as our lens to interpret the three themes: (1) intrapersonal, (2) interactional, and (3) behavioral. The themes reflected the forms of STEM empowerment experienced by students. Future research should explore how STEM empowerment differs among student types; for example, does it extend to secondary and middle school students when they engage in STEM-focused, SL experiences? And if so, how do teacher preparation programs of agricultural education begin to prepare graduates with the knowledge and skills needed to facilitate such outcomes?*

## **Introduction**

Higher educational institutions are failing to create learning experiences that prepare students for the real world (Billig, 2002; Mentkowsi et al., 2000). In response, Mentkowsi et al. (2000) called for more attention to be devoted to outcomes that help students succeed after graduation. A growing number of scholars have argued (Lake & Jones, 2008; McHue, 2000; Rocheleau, 2004; Speck & Hoppe, 2004) that service-learning (SL) may be the optimal pedagogical approach for preparing students with the experiences needed to thrive in today's society, especially in regard to equipping them with skills in science, technology, engineering, and mathematics (STEM).

SL has been defined and imaged in variant ways throughout its journey as a method of instruction, especially in school-based, agricultural education (SBAE) (Roberts & Edwards, 2015, 2018). However, Bringle and Hatcher (1995) opined that SL should infuse learning, service, and reflection through intentional learning episodes in a local context. In U.S. education's current moment, SL's rationale stems from decades of frustration surrounding the nation's poor academic performance and critiques that students are unprepared to face challenges after high school (Swaminathan, 2007). Further, leaders in government and business are concerned the United States' economic advantage might dissolve if interest and skill development in career fields, such as STEM, remain neglected in education (President's Council

of Advisors on Science & Technology Strategy to Improve STEM Education [PCAST], 2012). Given this historical and societal context, SL has flourished as a pedagogy calibrated to address such concerns (Green, 2001, 2003). Despite an expanding literature base, however, little consistency has emerged regarding the reported outcomes experienced by students (Butin, 2007).

This inconsistency notwithstanding, SL has been depicted as a method of instruction with transformative benefits (Gilbride-Brown, 2008; Giles & Eyler, 1994; Roberts & Edwards, 2018). For instance, the literature portrays the method as a way to empower students in areas such as academic learning, personal development, civic engagement, as well as the ability to promote diversity (Gilbride-Brown, 2008; Green, 2001, 2003). As a consequence, a *victory narrative* (Roberts & Edwards, 2018) for the method appears to have been advanced by scholars and practitioners in agricultural education. This victory narrative seems to have concealed many dimensions of students' outcomes through SL projects. As a consequence, Gilbride-Brown (2008) called into question the method's ability to address issues such as diversity and academic achievement. The STEM literature also perpetuates a similar discourse. For instance, Newman, Dantzer, and Coleman (2015) argued that theoretically weak constructs and one-sided accounts currently inform our understanding of STEM. As an illustration, skill development is typically conceptualized as a *reason* to introduce students to STEM projects. However, consistent with SL's discourse, the STEM literature also appears to ignore the role that students' affective dimensions have on influencing variables such as *academic achievement*, *skill development*, and *attitude formation* toward diversity. Because of the lack of uniformity in both literature bases, therefore, scholars have called for a sharper focus on understanding such variables (Billig, 2002; Pierrakos et al., 2013).

Progress (Honey, Pearson, & Schweingruber, 2014; National Research Council, 2011; Pierrakos, 2013) has been made to integrate SL and STEM, particularly with underrepresented populations. Some evidence (Pierrakos et al., 2013) about the outcomes of STEM-focused, SL experiences demonstrated that students' interactions with diverse populations have statistically significant relationships with their associated learning outcomes. However, a larger body of literature has reported negligible associations (Jones & Hill, 2001; Sperling, Wang, Kelly, Hritsuk, 2003). From a qualitative perspective, the benefits of SL have been described as helping improve students' acceptance, respect, and tolerance for underrepresented populations (Green 2001, 2003; Roberts & Edwards, 2016). Despite this insight, however, little progress has been made to articulate the *best practices* associated with using such an approach to ensure that instructors can facilitate SL experiences that encourage impactful, high-quality learning for students and communities. Because of this lack of evidence, opponents (Williams, 2011) have argued that practitioners should approach the merger of SL and STEM with caution. In addition to these deficiencies, the literature also calls attention to the need for a more understanding in regard to using SL as a method of instruction, especially when working with underrepresented populations, in teacher preparation programs of agricultural education (Roberts, Edwards, & Ivey, 2018; Roberts, Edwards, & Robinson, 2018).

For example, Roberts, Edwards, and Robinson (2018) reported that teacher educators of agricultural education recognized that deterrents were present at the classroom level, which

influenced their decision of whether to use SL with their pre-service students.

Nevertheless, SL (Roberts & Edwards, 2015, 2018) and STEM (DiBenedetto, Easterly, & Myers, 2015; Smith, Rayfield, & McKim, 2015; Stubbs & Myers, 2015) appear to be deeply rooted in agricultural education. Because of teacher educators' lack of intention to use SL in the preparation of agricultural education teachers, however, Roberts, Edwards, and Ivey (2018) suggested that more work be undertaken to demonstrate effective strategies in teacher preparation that promote positive outcomes for students and communities through SL. Woods (2004) also called for a more intimate understanding of the outcomes that agricultural education students may experience as they engage with underrepresented populations through SL projects, such as those emphasizing STEM in agriculture. As a consequence, a need existed to understand how agricultural education students experienced empowerment as they engaged with underrepresented populations during a SL project.

### **Theoretical Framework**

Zimmerman's (1995) empowerment theory (ET) emerged as the most appropriate lens to interpret agricultural education students' experiences during a SL project in which they taught STEM concepts to underrepresented populations in agriculture. Although difficult to define, empowerment has been operationalized as individuals' ability to exert mastery over the forces and issues that concern them (Zimmerman, Israel, Schulz, & Checkoway, 1992). Zimmerman (1995) theorized that three variables presage individuals' empowerment: (1) *intrapersonal*, (2) *interactional*, and (3) *behavioral*. The first variable, *intrapersonal*, represents how an individual perceives themselves as well as their capacity to influence others. Therefore, the intrapersonal variable includes processes such as motivation, self-efficacy, perceived control, as well as mastery over domain-specific competence (Zimmerman, 1995). The *interactional* variable, however, refers to individuals' ability to understand contextual influences when taking action to achieve a goal (Zimmerman & Rappaport, 1988). Through this critical awareness, they are then able to "exert control in their environment" (Zimmerman et al., 1992, p. 589) and mobilize relevant resources. The final variable, *behavioral*, reflects the direct actions that individuals take to affect outcomes. It also includes behaviors that assist individuals with managing stress and adapting to changes (Zimmerman et al., 1992).

As a consequence, we investigated agricultural education students' empowerment by analyzing their self-reported experiences as well as those we observed throughout the SL project. For instance, we placed particular emphasis on students' changes throughout the project regarding self-efficacy, motivation, and perceived competence. We also probed students' understandings of contextual variables such as understanding their audience, setting, as well as other relevant personal and professional factors that might have affected their outcomes. We also examined the *intensity* and *duration* of their actions to ensure their SL project was successful. As a result, Zimmerman's (1995) ET served as a productive lens to *make meaning* of students' SL experiences.

### **Epistemological Lens, Purpose, and Rationale**

We used the *constructionism* (Crotty, 1998) epistemological position to guide our

purpose, methodology, and procedural decisions (Koro-Ljungberg, Yendol-Hoppy, Smith, & Hayes, 2009). Through the lens of constructionism, knowledge is “. . . contingent upon human practices, being constructed in and out of interaction between human beings and the world, and developed and transmitted within an essentially social context” (p. 42). By allowing the constructionist position to guide this investigation, we upheld Koro-Ljungberg et al. (2009) call to achieve greater epistemological awareness and instantiation of methods by reducing qualitative ambiguity. Using this constructionism worldview, therefore, we developed the following purpose statement: *This investigation sought to describe how agricultural education students experienced empowerment in STEM as they engaged with underrepresented populations during a semester-long, SL project.* Because this investigation promoted building local capacity, it addressed the American Association for Agricultural Education’s Research Priority Area 6: Vibrant, Resilient Communities (Graham, Arnold, & Jayaratne, 2016).

### **Background of the Study**

North Carolina A&T State University is an 1890 Land-grant Institution and is recognized as Historically Black College or University (HBCU); therefore, it serves a diverse population of students. The agricultural education major at North Carolina State University has two tracks: (1) professional licensure – designed for students who intend to teach agriculture in a formal school-based setting, and (2) professional service – designed for students who intend to teach in non-formal contexts such as cooperative extension. In fall 2017, we made a curricular change to the *Methods and Materials of Teaching Agricultural and Extension Education* course by implementing a SL project that allowed students to use their knowledge and skills to give back to their local community. Agricultural education majors are required to take the course and typically do so in the fall semester of their senior year. The purpose of the course was to introduce students to foundational knowledge in instructional design, teaching methods, and delivering learning experiences in formal and informal contexts. As a result, we required students to *design, organize, and deliver* a SL project by developing a series of agricultural literacy seminars that focused on promoting STEM. Students were required to deliver the seminars to diverse audiences that traditionally lacked access to resources and quality information about agriculture, i.e., an *underrepresented population*. To ensure the project followed best practices, we used Roberts’, Terry’s, Brown’s, and Ramsey’s (2016) intrinsic SL model (ISLM) to guide the project’s design (see Figure 1).

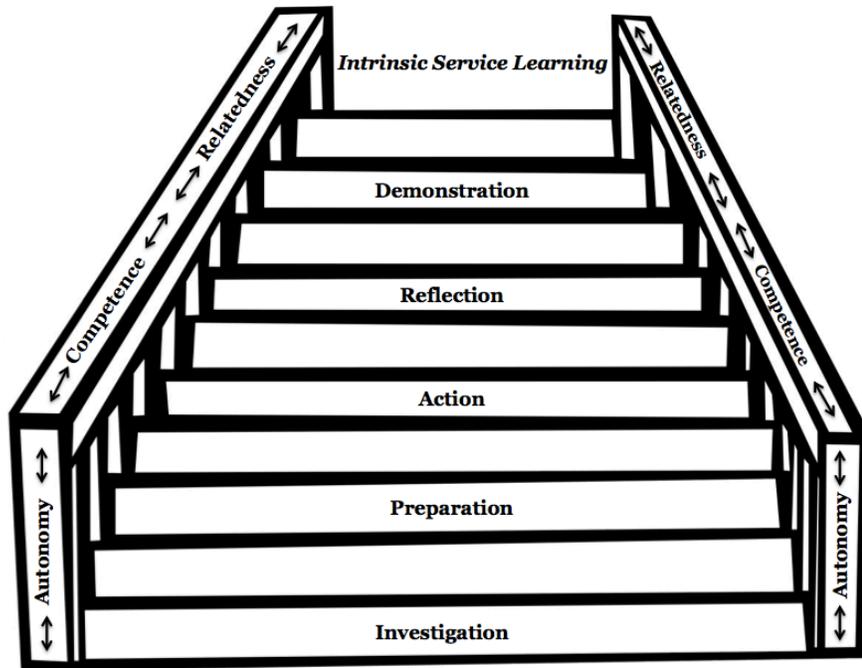


Figure 1. Intrinsic service-learning model. From “Students Motivations, Value, and Decision to Participate in Service-Learning at the National FFA Days of Service,” by R. Roberts, R. Terry Jr., N. R. Brown, and J. W. Ramsey, 2016, *Journal of Agricultural Education*, 57(2), p. 197. Copyright 2016 by the Journal of Agricultural Education.

Roberts et al. (2016) ISLM was initially developed to assist practitioners in delivering SL experiences that intrinsically motivate students. The model presents the stages of SL – investigation, preparation, action, reflection, and demonstration – as a progression of steps. Three elements of intrinsic motivation also support the steps of SL: (1) autonomy, (2) competence, and (3) relatedness (Roberts et al., 2016). The intent, therefore, is for instructors to lead students through the various stages of SL while also promoting intrinsic motivation (Roberts et al., 2016). To implement the model for this course, the instructor of record began by allowing students to select one of the following groups to partner with for the SL project: (a) Black Farmer groups, (b) urban landscaping groups, (c) urban 4-H Clubs, or (d) urban Girl Scout Clubs. After making a selection, students then contacted their selected group’s leader to obtain more information and arrange a time to observe, i.e., the *investigation* stage. After gaining more insight, students then entered the *preparation* stage by selecting a topic and collaborating with a content expert to develop their seminar and ensure that lessons appropriately emphasized STEM in agriculture. Students created seminars on a range of topics such as: (a) crop science, (b) technology in horticulture, (c) engineering’s relevance for farmers, (d) math in animal science, (e) technology and robotics in plant science, (f) science in the dairy industry, as well as a plethora of other related topics.

After receiving approval from the instructor, the students then took *action* by delivering their seminars over a period of four weeks. Throughout this process, students submitted photos and written *reflections* that articulated the connections they made between their coursework and the SL project. Finally, students *demonstrated* their knowledge by sharing their major takeaways with their peers. It is important to note that the instructor of record's underlying assumptions about teaching and learning greatly shaped the design of the course. To be more transparent about our influences, therefore, we offer our reflexivity statement next.

### **Reflexivity**

To own our biases in this investigation (Patton, 2002), we constructed the following reflexivity statement. We hope that by revealing our previous experiences and assumptions about this study, it promotes greater *sincerity* and *honesty* (Lincoln & Guba, 1985).

*The lead researcher in this study was a white male and served as the instructor of record for the course under investigation. Two other researchers, who are both African American agricultural education faculty members at North Carolina State University, assisted during the design of the course and with the analysis of data. All three researchers are former school-based, agricultural education (SBAE) instructors; therefore, we held unique biases about how students learn in agriculture. It is also relevant to reveal that the lead researcher had previous SL teaching experience. Such biases encouraged him to use SL as a method of instruction in the course.*

These experiences and views, therefore, had the potential to influence our interpretations of the data. As a result, we negotiated findings and strove to reduce possibilities of bias when possible.

### **Methodology**

We used Stake's (1995) instrumental case study approach to ground this study methodologically. Instrumental case studies are used to provide insight into a specific issue within a case; they can also illuminate how such an issue affects individuals within a bounded system (Stake, 1995). As a result, researchers can provide a rich, contextually situated explanation of the phenomenon (Creswell, 2013). In this investigation, the instrumental case study approach allowed us to examine one particular issue, i.e., how agricultural education students experienced empowerment in STEM during a SL project. As such, we bounded the case by *time* (one academic semester) and *unit of analysis* (the course). Next, we provide more insight into participants' characteristics.

### **Participants**

Participants ( $N = 20$ ) were agricultural education students enrolled in the *Methods and Materials of Teaching Agricultural and Extension Education* course at North Carolina A&T State University. Of the students, 13 (65%) were on the professional service (informal teaching) track and seven (35%) were focused on obtaining professional licensure (formal teaching). Regarding race, 12 (60%) were African American, seven (35%) were white, and one (5%) identified as other. Further, 70% ( $f = 14$ ) of the students identified as female. Finally, 85% ( $f$

=17) of students reported they had a low socio-economic status.

### Data Sources and Analysis

This investigation warranted direct experience with the phenomenon (Patton, 2002). Therefore, the lead researcher engaged in the study's activities throughout the semester. Because of this experience, he was able to gain an *insider's view* (Saldaña, 2015) by interacting in-depth with participants and also conducting regular observations of the day-to-day activities of the SL project. He was also able to gain insight into participants' successes and struggles as they engaged with underrepresented populations throughout their SL experience. Because of his position, he was able to collect a range of sources to gain a *rounded view* (Patton, 2002) of the multiple ways that participants experienced STEM empowerment.

To understand better this phenomenon, we collected the following data sources: (a) interviews, (b) participant developed documents, (c) written reflections, (d) participant submitted photographs, and (e) observation/field notes. Besides assuming the role as a *participant observer* (Patton, 2002), the lead researcher also conducted semi-structured interviews with each participant ( $N = 20$ ) at the conclusion of their SL experience, which lasted from 60 to 85 minutes in length. He also conducted follow-up interviews to allow the students to extend or clarify their thoughts and views. After the lead researcher transcribed each interview verbatim, the participants were asked to review the transcripts for accuracy, i.e., *member checking* (Creswell, 2013). To facilitate systematic observations, we used Emerson's, Shaw's, and Fretz's (2011) procedures to capture meaning through jottings and fieldnotes. To further triangulate findings, we also collected *documents* (Linde, 2009) and *visual evidence* (Pink, 2007) to achieve a *saturation* of the study's findings.

In our analysis of the data, we analyzed all sources of data using Corbin's and Strauss' (2015) constant comparative method. To accomplish this, we used *incubation* and *immersion* (Patton, 2002) techniques as we coded, reduced the data, and arrived at themes. This process was facilitated through the use of three coding levels: (1) open, (2) axial, and (3) selective (Corbin & Strauss, 2015). To initiate open coding, we read each source of data line-by-line (Corbin & Strauss, 2015) and then analyzed sources through different lenses using Saldaña's (2012) *in vivo*, *descriptive*, and *categorical* coding procedures. Through this approach, we were able to produce 1,154 open codes that preserved *context* and *meaning* (Corbin & Strauss, 2015).

In our second level of analysis, *axial coding*, we analyzed the existing relationships among our initial codes. Then, we began to collapse the open codes into categories (Corbin & Strauss, 2015). To maintain context, we then employed horizontal analysis to compare the axial codes with our field notes. Thereafter, we merged *indigenous concepts* (Emerson et al., 2011) with the axial codes through a conceptual memoing technique (Saldaña, 2012). Our final cycle of analysis began by developing *evidentiary warrants* (Saldaña, 2012) that aligned participants' words with our preliminary meta-inferences of the study – a process illuminating the data's existing *congruencies* and *discrepancies*.

To substantiate our evidentiary warrants, we began to “think with theory” (Jackson &

Mazzei, 2012, p. 6) through a plethora of different frameworks. Through this *alternative read* of the data, Zimmerman's (1995) ET demonstrated the greatest *theoretical fit*. Therefore, we mobilized the theory in the *selective coding* phase by comparing the theory to congruent and incongruent evidence. Through this process of comparison, we reduced the data to three themes, which were narrated through the lens of Zimmerman's (1995) ET.

### **Rigor and Trustworthiness**

To ensure this investigation provided *quality conclusions* (Miles, Huberman, & Saldaña, 2014), we embedded Lincoln's and Guba's standards for rigor and trustworthiness – confirmability, dependability, credibility, and transferability– throughout each phase of this study. These standards served as our primary anchor as we maneuvered through the various ethical-based decisions that emerged in this investigation. We provided our strategies for addressing each of Lincoln's and Guba's (1985) standards next.

We upheld *confirmability*, or the ability to remain neutral and reasonably unbiased, in this investigation using four primary strategies: (1) providing a clear explanation our data collection and analysis procedures, (2) being explicit about our values, worldviews, and biases, (3) maintaining an audit trail, and (4) mobilizing rival theories and explanations. We also emphasized the importance of producing findings that are consistent and stable over, or *dependability*, by collecting data through a range of sources and negotiating interpretative differences among researchers.

The third standard, *credibility*, refers to whether the findings make sense and ring true. To accomplish this, we provided context-rich descriptions and triangulated our findings through multiple data sources. Finally, *transferability* represents whether the findings of a study can be transferred to other contexts. In this study, we emphasized transferability using three strategies: (1) providing participants' characteristics so that fair comparisons could be made to other samples, (2) providing a thick description of the findings, and (3) ensuring that findings were supported by existing theory. Using these strategies, we upheld Lincoln's and Guba's (1985) standards rigor and trustworthiness.

## **Findings**

As a product of our analysis procedures, three themes emerged. The themes describe the *forms of STEM empowerment* experienced by agricultural education students as they engaged with underrepresented populations during a SL project. To narrate the findings, we used Zimmerman's (1995) ET as our lens to illuminate the three forms of STEM empowerment – intrapersonal, interactional, and behavioral – that emerged in this study. Salient examples from interviews, students' written reflections, photographs, and our fieldnotes were also featured to emphasize transferability (Lincoln & Guba, 1985).

### **Theme 1: *Intrapersonal STEM Empowerment***

The first theme demonstrated the way in which students experienced *Intrapersonal STEM Empowerment* as a result of their SL experiences. Intrapersonal empowerment represented how agricultural education students perceived themselves (Zimmerman, 1995) regarding three processes: (1) motivation, (2) self-efficacy, and (3) competence.

**Shifting Motivations.** In the beginning stages of the SL project, we observed that students' motivation appeared to be more extrinsic. For example, they primarily inquired about the project's *requirements* and *grading policies*. As students took more ownership of their experience, however, their motivation appeared to shift. Participant #3 explained that she "got more motivated" as the project progressed. Participant #11 expressed similar sentiments when she wrote the following passage in a reflection:

When I first started the [SL] project, I was annoyed that it [would require] so much work. But after meeting all of the kids in Girl Scouts, I am starting to get a lot more passionate about it. The girls are really cool, so I am thinking about continu[ing] to help out next semester.

Meanwhile, Participant #7 explained that his motivational shift occurred after interacting with a local Black Farmers Group. He shared: "When this [the SL project] first started I just wanted to get a good grade, but after I started teaching the farmer group about the science aspects of growing crops it felt good to see I was helping them and I got more motivated."

**Self-Efficacy.** Emergent patterns from our fieldnotes demonstrated that students were *hesitant* initially about teaching STEM concepts. However, after analyzing participants' talk about their self-efficacy in STEM, we recognized this initial reluctance evolved throughout the project. For example, Participant #19 explained: "I was really nervous about the STEM aspect because I am not strong in those areas. But after getting more experience, I feel a lot more confident now." Participant #2 also touched on this issue in one of her written reflections: "STEM can be really intimidating. I mean I do not know what to do with all of the microscopes and numbers, but this project has been good for me because I have to boil it all down and explain it to the kids."

**Perceived Competence.** Through the SL project, students also noted that they gained competence in STEM. For example, they began to understand better the connections between STEM and their coursework. Participant #9 shared:

I had to take my Praxis exam [a requirement for teacher certification] a few weeks ago, and I noticed that some of the concepts that I was tested on were some of the same ones that I was teaching to the 4-H kids, it was really cool to see that connection and feel confident in my answers."

Participant #13 also perceived he developed more competence in STEM as a result of the SL project. He revealed: "Because of this experience, I feel a lot more confident in my ability to teach STEM. I think before I would have skipped over them [i.e., STEM topics], to be honest, but now I see that I can do it and that it [can be] fun."

## **Theme 2: *Interactional STEM Empowerment***

The second theme, *Interactional STEM Empowerment*, highlighted the ways that students gained mastery over their environment (Zimmerman, 1995) to ultimately shape their SL experience. Two sub-themes were used to describe the *Interactional STEM Empowerment* theme: (a) critical awareness and (b) resource mobilization.

**Critical Awareness.** In students' early written reflections, they highlighted the role that *observations* played in helping them understand the types of STEM knowledge and skills warranted by the group they intended to serve. Participant #16 expressed: "At first I thought the observations were pointless, but after I started talking to some of the Black Farmers Group, I started to understand the types of STEM knowledge they needed." Participant #20 also perceived she gained deeper understanding through her observations. She explained:

The observation aspect was really important for me. I got to see how the girls interacted with each other. I also got to talk to them about their interests. Most of them [the girls] did not think STEM was very cool, so when I designed my seminars, I tried to make sure it was fun but and useful to them. I think it [the observations] was really important also because when I was teaching, I would try to explain it in a way that connected to their interests.

**Resource Mobilization.** Students also learned how to recognize and use resources in their environments. Participant #15 shared:

During the project, I learned how important it was to use the resources available. At my SL site, we had access to a few GPS systems, so I decided to flip my lesson around to highlight the use of technology in plant science. The group seemed to appreciate it, and they learned a lot, so it made me feel successful.

Participant #1 also highlighted the importance of mobilizing local resources. In a reflection, she wrote:

During my conversation with the local 4-H leader, she explained that the kids are really interested in robotics and they have some materials, but she did not really know anything about the topic. So, I decided to design my SL experience about teaching the 4-H members robotics. I'm excited that I get to help them in this area.

### **Theme 3: *Behavioral STEM Empowerment***

The final theme, *Behavioral STEM Empowerment*, reflects the specific actions (Zimmerman, 1995) students took to affect the outcomes of their SL experience. As a consequence, two subthemes served as the foundation of the theme: (1) coping with STEM anxiety, and (2) skill development.

**Coping with STEM Anxiety.** In our observations, we continually noted that students seemed to experience *anxiety* and *stress* when attempting to understand and design curriculum on STEM topics. Therefore, we probed this issue during individual interviews. Participant #4

explained: “STEM just really stresses me out. I know its important and all, but it just makes me nervous.” Participant #6 agreed, she expounded: “I mean I like STEM, but it can get really complex and stressful sometimes.”

Based on these visceral responses, we asked students to explain how they managed to complete the project despite their STEM anxiety. Participant #12 explained: “Because I was nervous I practiced and rehearsed the material quite a bit, which helped me feel more confident.” However, Participant #19 used another approach; she revealed: “Because math is hard for, I got a lot of assistance from [Name Blinded] in the math department. Just having her explain it really helped.”

**Skill Development.** During the semester, students developed critical skills in STEM and the facilitation of learning in various environments. In our analysis of the study’s visual evidence, we noted that students depicted their STEM skill development as well. For example, in Participant #9’s, photo and caption (see Figure 2) she shared: “I was nervous when I started, but by interacting the 4-Hers and helping them gain STEM knowledge through my teaching – it just made me feel confident and successful. Participant #7 added: “I learned a lot of new skills in this project and feel a lot more prepared to teach other people about STEM in agriculture.” Figure 2 presents photos submitted by Participant’s #7 #9 and #1 that depict them using their pedagogical and technical STEM skills at their SL site.



*Figure 2.* Participant 7’s (Left), Participant 9’s (Center), and Participant 1’s (Right) photo submissions from the SL project. Photos illustrate participants’ skill development in STEM by facilitating learning during the semester. *Note.* Participants’ faces have been de-identified to protect their identities.

## Conclusions

The purpose of this study was to describe how agricultural education students at North Carolina A&T State University experienced empowerment in STEM as they engaged with underrepresented populations during a semester-long, SL project. Using Zimmerman's (1995) ET, we interpreted the findings through three themes: (a) *Intrapersonal STEM Empowerment*, (b) *Interactional STEM Empowerment*, and (3) *Behavioral STEM Empowerment*.

The first theme, *Intrapersonal STEM Empowerment*, revealed how participants perceived themselves in regard to STEM. For instance, many of the students began the SL project extrinsically *motivated*. However, over the course of the semester, their motivation shifted as they began to perceive more value in their efforts. Students also gained *self-efficacy* and *perceived competence* in STEM as the SL project progressed. These intrapersonal shifts appeared to frame how students viewed and interpreted their experiences and resulting outcomes. In the literature, Roberts et al. (2016) reported the importance that motivation plays on shaping students' experiences. However, scant evidence exists regarding how *self-efficacy* and *perceived competence* affect the empowerment of agricultural education students in STEM.

*Interactional STEM Empowerment*, which illuminated how students gained mastery over their environment, emerged as the study's second theme. Through this investigation, we noted that students accomplished such by acquiring a *critical awareness* and *mobilizing resources* about STEM. It is important to note that in the course under investigation, students were required to conduct observations at their service site before engaging in SL. As a result of these observations, it appears that agricultural education students began to build relationships and gain a deeper understanding of the types of resources that would be available. Although SL proponents (Roberts & Edwards, 2015, 2016; Rocheleau, 2004) have encouraged relationship-building activities, the notion seems to be emphasized less in the literature on STEM. As a consequence, this investigation provided critical new insights into how *contextual* and *relational* variables may affect students' STEM empowerment. The final theme, *Behavioral STEM Empowerment*, articulated how students took specific actions to influence the outcomes of their SL project. For example, students learned to cope with their STEM anxiety and use the skills developed throughout the semester to enact positive change. The literature on STEM (Ramirez, Chang, Maloneyh, Levine, & Beilock, 2016) has explored the influence that anxiety may have students' performance. However, findings from this study elucidate ways that agricultural education students' coped with this anxiety to achieve positive outcomes. Although the notion that students can develop knowledge and skills though SL is well established (Giles & Eyler, 1994; Roberts & Edwards, 2015, 2018), less evidence has been reported about the method's potential to encourage students to acquire pedagogical and content knowledge.

### **Discussion, Implications, and Recommendations**

As concerns mount (PCAST, 2012) that the U.S. may lose its economic advantage if more emphasis is not placed on promoting STEM *interest* and *skill* development, SL has prospered in higher education (Banerjee & Hausafus, 2007; Smith, 2008). This prosperity can largely be attributed to the method's depiction as an approach that facilitates critical thinking and

students' application of knowledge in real-world contexts (Roberts & Edwards, 2018). In the current study, therefore, we sought to examine agricultural education students' outcomes as they facilitated the instruction of STEM concepts through a SL project. In our analysis of the data, we noted that students experienced STEM empowerment in three forms: (a) intrapersonal, (b) interactional, and (c) behavioral. As a consequence, this study provides implications for research, theory, and practice.

Future research, therefore, should explore how STEM empowerment differs among student types. For example, does STEM empowerment extend to secondary and middle school students when they engage in STEM-focused, SL experiences? If so, how do teacher preparation programs of agricultural education begin to prepare pre-service and in-service teachers to address such outcomes? We also recommend that agricultural education teacher educators implement SL projects that emphasize STEM in their curriculum. In our analysis of data, it became apparent that students' reflections helped them process and make meaning of various ways they experienced STEM empowerment. Therefore, we suggest that future studies examine the types of reflection that shape students' outcomes most profoundly. Zimmerman's (1995) ET has primarily be used as a quantitative lens. In this investigation, we demonstrated that the theory could also serve as a productive lens to explain STEM empowerment through SL. Despite its usefulness, however, Zimmerman's (1995) ET does warrant work. For example, so far, the theory has described three constructs relevant to empowerment. However, future investigations should more evocatively explore the *process of empowerment*. Describing such a process could assist practitioners with more intimately understanding how to design SL experiences and interventions that yield powerful, far-reaching outcomes for underrepresented populations.

As calls mount (National Research Council, 2011; Pierrakos, 2013) to build the STEM knowledge and skills of future generations, this study provided a valuable experience to agricultural education students in which they built capacity in their local community and provided a critical need to underrepresented populations. Despite the SL project's successes, however, it should be noted that it required considerable planning, coordinating, and resource allocation. Therefore, we recommend that practitioners dedicate the curricular space needed to coordinate efforts at various service sites as well as with the students and volunteers necessitated for such a project to be implemented successfully. For the course under investigation, Roberts et al. (2016) ISLM served as a practical conceptual guide for SL. We, therefore, recommend that teacher preparation programs consider Roberts et al. (2016) ISLM in the development of their SL experiences. Moving forward, we also suggest that practitioners consider the three forms of empowerment identified in this study to design SL experiences in ways that may encourage the STEM empowerment agricultural education students.

## References

- Banerjee, M., & Hausafus, C.O. (2007). Faculty use of service-learning: Perceptions, motivations, and impediments for the human sciences. *Michigan Journal of Community Service Learning, 14*(1), 32-45. Retrieved from

<http://hdl.handle.net/2027/spo.3239521.0014.103>

- Billig, S. H. (2002). Support for K-12 service-learning practice: A brief review of the research. *Educational Horizons*, 80(1), 184–190. Retrieved from <http://www.jstor.org/stable/42927126>
- Billig, S. H. (2007). Unpacking what works in service-learning: Promising research-based practices to improve student outcomes. In J. C. Kielsmeier (Ed.), *Growing to Greatness 2007* (pp. 18–28). St. Paul, MN: National Leadership Council.
- Billig, S. H., Root, S., & Jesse, D. (2005). The relationship between quality indicators of service-learning and student outcomes: Testing professional wisdom. In S. Root, J. Callahan, & S. H. Billig (Eds.), *Advances in SL research: Vol. 5. Improving service-learning practice: Research on models to enhance impacts* (pp. 97–215). Greenwich, CT: Information Age.
- Bringle, R. G., & Hatcher, J. A. (1995). A service-learning curriculum for faculty. *Michigan Journal of Community Service Learning*, 2(1), 112-122. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0002.111>
- Butin, D. W. (2007). Justice-learning: Service-learning as justice-oriented education. *Equity and Excellence in Education*, 40(2), 177-183. doi:10.1080/10665680701246492
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Los Angeles, CA: Sage.
- Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. Thousand Oaks, CA: Sage.
- DiBenedetto, C. A., Easterly III, R. G., & Myers, B. E. (2015). Can scientific reasoning scores predict the likelihood of SBAE students' intent to pursue a STEM career, a career in agriculture, or plan to attend college? *Journal of Agricultural Education*, 56(1), 103-115. doi:10.5032/jae.2015.01103
- Emerson, R. M., Fretz, R. I., & Shaw, L. L. (2011). *Writing ethnographic fieldnotes* (2nd ed.). Chicago, IL: University of Chicago Press.
- Gilbride-Brown, J. K. (2008). (E)racing service-learning as critical pedagogy: Race matters (Doctoral dissertation). Retrieved from [http://rave.ohiolink.edu/etdc/view?acc\\_num=osu1226014242](http://rave.ohiolink.edu/etdc/view?acc_num=osu1226014242)
- Giles, D., Jr., & Eyler, J. (1994). The impact of a college community service laboratory on student's personal, social, and cognitive outcomes. *Journal of Adolescence*, 4(1), 21-35. Retrieved from <http://dx.doi.org/10.1006/jado.1994.1030>

- Graham, D. L., Arnold, S., & Jayaratne, K. S. U. (2016). Research priority 6: Vibrant, resilient communities. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020* (pp. 49-56). Gainesville: Department of Agricultural Education and Communication, University of Florida.
- Green, A. E. (2001). 'But you aren't white': Racial perceptions and service-learning. *Michigan Journal of Community Service Learning*, 8(1), 18-26. Retrieved from <https://www.questia.com/library/journal/1G1-206689567/but-you-aren-t-white-racial-perceptions-and-service-learning>
- Green, A. E. (2003). Difficult stories: Service-learning, race, class, and whiteness. *College Composition and Communication*, 55(2), 276-301. doi:10.2307/3594218
- Honey, M., Pearson, G., & Schweingruber, H. (2014). *STEM integration in K-12 education: Status, prospects, and an agenda for research*. Washington, D.C: National Academies Press.
- Jackson, A. Y., & Mazzei, L. A. (2012). *Thinking with theory in qualitative research: Viewing data across multiple perspectives*. New York, NY: Routledge
- Jones, S. R. & Hill, K. E. (2001). Crossing high street: Understanding diversity through community service-learning. *Journal of College Student Development*, 42(3), 204-217. Retrieved from <https://eric.ed.gov/?id=EJ630559>
- Koro-Ljungberg, M., Yendol-Hoppey, D., Smith, J. J., & Hayes, S. B. (2009). (E)pistemological awareness, instantiation of methods, and uninformed methodological ambiguity in qualitative research projects. *Educational Researcher*, 38(9), 687-699. doi:10.3102/0013189X09351980
- Lake, V. E., & Jones, I. (2008). Service-learning in early childhood teacher education: Using service to put meaning back into learning. *Teaching and Teacher Education*, 24(8), 2146-2156. doi:10.1016/j.tate.2008.05.003
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.
- Linde, C. (2009). *Working the past: Narrative and institutional memory*. Oxford, England: Oxford University Press.
- McHue, B. (2000). *Service-learning: The formative years*. Detroit, MI: W.K. Kellogg Foundation Press.
- Melodia, A., & Small, T. (2002). Integrating math and science into agriculture. *The Agricultural Education Magazine*, 75(3), 18-19. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume75/v75i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume75/v75i3.pdf)
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis* (3rd ed.).

- Thousand Oaks, CA: Sage.
- Mentkowski, M., Rogers, G., Doherty, A., Loacker, G., Hart, J. R., Rickards, W., & Diez, M. (2000). *Learning that lasts: Integrating learning, development, and performance in college and beyond*. San Francisco, CA: Jossey-Bass.
- National Research Council. (2011). *Successful K-12 STEM education: Identifying effective approaches in science, technology, engineering, and mathematics*. Washington, DC: National Academies Press.
- Newman, J. L., Dantzler, J., & Coleman, A. N. (2015). Science in action: How middle school students are changing their world through STEM service-learning projects. *Theory into Practice, 54*(1), 47-54. doi:10.1080/00405841.2015.977661
- Patton, M. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Pink, S. (2007). *Doing visual ethnography* (2nd ed.). Thousand Oaks, CA: Sage.
- Pierrakos, O., Nagel, R., Pappas, E., Nagel, J., Moran, T., Barrella, E., & Panizo, M. (2013). A mixed-methods study of cognitive and affective learning during a sophomore design problem-based service learning experience. *International Journal for Service Learning in Engineering, Humanitarian Engineering and Social Entrepreneurship, Special Edition, 1*-28. Retrieved from <http://library.queensu.ca/ojs/index.php/ijlse/article/view/5145/5035>
- President's Council of Advisor's on Science & Technology Strategy to Improve K-12 STEM Education [PCAST]. (2012). *Engage to excel: Producing one million additional college graduates with degrees in science, technology, engineering, and mathematics*. Author. Retrieved from [https://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-engage-to-excel-final\\_feb.pdf](https://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-engage-to-excel-final_feb.pdf)
- Ramirez, G., Chang, H., Maloney, E. A., Levine, S. C., & Beilock, S. L. (2016). On the relationship between math anxiety and math achievement in early elementary school: The role of problem solving strategies. *Journal of Experimental Child Psychology, 141*(1), 83-100. Retrieved from <https://doi.org/10.1016/j.jecp.2015.07.014>
- Roberts, R., & Edwards, M. C. (2015). Service-learning's ongoing journey as a method of instruction: Implications for school-based, agricultural education. *Journal of Agricultural Education, 56*(2), 217-233. doi:10.5032/jae.2015.02217
- Roberts, R., & Edwards, M. C. (2016). Transforming students' global knowledge and perspectives through international service-learning (ISL) in Uganda: How six U.S. university agriculture students made sense of their lived experiences over time. *Journal of International Agricultural and Extension Education, 23*(3), 7-23. doi:10.5191/jiaee.2016.23301
- Roberts, R., & Edwards, M. C. (2018). Imaging service-learning in *The Agricultural Education Magazine* from 1929-2009: Implications for the method's reframing and use. *Journal of*

- Agricultural Education*, 59(3), 15-35. Retrieved from <https://doi.org/10.5032/jae.2018.03015>
- Roberts, R., Edwards, M. C. & Ivey, T. A. (2018). *Planned behavior typologies of agricultural education teacher educators in regard to service-learning as a method of instruction: A national, mixed methods study*. Paper presented at the 45th Annual Conference of American Association for Agricultural Education, Charleston, SC.
- Roberts, R. Edwards, M. C. & Robinson, J. S. (2018). *Deterrents to service-learning's use as a method of instruction in the preparation of agricultural education teachers: The beliefs and intentions of teacher educators*. Paper presented at the 45th Annual Conference of the American Association for Agricultural Education, Charleston, SC.
- Roberts, R., Terry, R., Jr., Brown, N. R., & Ramsey, J. W. (2016). Students' motivations, value, and decision to participate in service-learning at the National FFA Days of Service. *Journal of Agricultural Education*, 57(2), 199-214. doi:10.5032/jae.2016.02199
- Rocheleau, J. (2004). Theoretical roots of service-learning: Progressive education and the development of citizenship. In B. W. Speck & S. I. Hoppe, *Service-learning: History, theory, and issues* (pp. 3-21). New York, NY: Greenwood Publishing Group.
- Romo, J. J., & Chavez, C. (2004). Wading into border pedagogy: Teacher preparation through service learning. *Journal of Border Educational Research*, 3(2), 1-5. Retrieved from <https://jber-ojs-tamui.tdl.org/jber/index.php/jber/article/view/7100/6364>
- Saldaña, J. (2012). *The coding manual for qualitative researcher* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Smith, C. P. (2008). *Perceptions, motivations, and concerns of post-secondary faculty regarding implementing service-learning pedagogy into curriculum* (Doctoral dissertation). Available from ProQuest. (UMI No. 3444942)
- 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), 183-203. doi:10.5032/jae.2015.04183
- Speck, B. W., & Hoppe, S. L. (2004). *Service learning: History, theory, and issues*. Westport, CT: Praeger Press.
- Sperling, R., Wang, V. O., Kelly, J. M. & Hritsuk, B. (2003). Does one size fit all? The challenge of social cognitive development. *Michigan Journal of Community Service Learning*, 9(2), 142-157. Retrieved from <https://www.questia.com/library/journal/1G1-206689615/does-one-size-fit-all-the-challenge-of-social-cognitive>
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage Publications.
- 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.2016.03087

- Swaminathan, R. (2007). Educating for the real world: The hidden curriculum of community service-learning. *Equity and Excellence in Education, 40*(2), 134-143. Retrieved from <https://doi.org/10.1080/10665680701246450>
- Williams, J. (2011). STEM education: Proceed with caution. *Design and Technology Education: An International Journal, 16*(1), 1-10. Retrieved from <https://jil.lboro.ac.uk/ojs/index.php/DATE/article/view/1590/1514>
- Woods, M. D. (2004). Cultivating cultural competence in agricultural education through community-based service-learning. *Journal of Agricultural Education, 45*(1), 10-20. doi:10.5032/jae.2004.01010
- Zimmerman, M. A., Israel, B. A., Schulz, A., & Checkoway, B. (1992). Further explorations in empowerment theory: An empirical analysis of psychological empowerment. *American Journal of Community Psychology, 20*(6), 707-727. Retrieved from <https://link.springer.com/article/10.1007/BF01312604>
- Zimmerman, M. A. (1995). Psychological empowerment: Issues and illustrations. *American Journal of Community Psychology, 23*(5), 581-599. Retrieved from <https://link.springer.com/article/10.1007/BF02506983>
- Zimmerman, M. A., & Rappaport, J. (1988). Citizen participation, perceived control, and psychological empowerment. *American Journal of Community Psychology, 16*(5), 725-750. Retrieved from <https://link.springer.com/content/pdf/10.1007/BF00930023.pdf>

## Discussant Remarks

### **Empowering Underrepresented Populations in STEM: Experiences of Agricultural Education Majors During a Service-Learning Project**

Jason Peake, University of Georgia

The introduction provides a strong justification for this study examining research on the topic from the past two decades. Zimmerman's empowerment theory was used as the theoretical framework for this study. Constructionism was appropriately chosen as the epistemological lens with which to view this research question. Background of the study gives a well-rounded view of the issues relevant to this study including service-learning and why North Carolina State was selected for data collection. An appropriate reflexivity statement is included and research biases are acknowledged. The methodology is appropriate for the question being studied and Lincoln's and Guba's recommendations were followed to ensure a rigor and trustworthiness.

The findings of this study are appreciated in that empowerment of diverse populations can be an abstract topic to examine and provide structure for. The authors do an excellent job at describing the phenomena and providing well informed and supported themes. Processes are also provided to better explain each theme and each process is equally well supported.

The authors report "Although SL proponents (Roberts & Edwards, 2015, 2016; Rocheleau, 2004) have encouraged relationship-building activities, the notion seems to be emphasized less in the literature on STEM." I am curious to hear more regarding the authors view of this discrepancy. What role do relationship-building activities play in how agricultural education students at North Carolina A&T State University experienced empowerment in STEM as they engaged with underrepresented populations during a semester-long, SL project?

The recommendations for research, theory, and practice are greatly appreciated with an emphasis on advise for practitioners. I do not believe it is possible to overstate the importance of the work by these authors. There is much work to be done in the area of empowerment in STEM, underrepresented populations, and SL projects. This study is greatly appreciated.

## **There's No Place Like Home: Why Students Enrolled in an Agricultural Leadership Degree Completion Program**

William G. Weeks, Oklahoma State University  
Penny Pennington Weeks, Oklahoma State University  
Lauren Lewis Cline, Oklahoma State University

### **Abstract**

*In response to the growing need to prepare college graduates for careers in food and agricultural sciences, faculty at Oklahoma State University developed an online baccalaureate degree completion program in agricultural leadership. Many students in Oklahoma earning their associates of science degree in agriculture were not pursuing four-year degrees, leading Oklahoma State University to better serve place-bound students by offering an online four-year degree program in the food and agricultural sciences in partnership with three regional two-year colleges. Twelve students comprised the first cohort to enroll in the program and were interviewed after completing a year of coursework. Three emergent themes provide understanding and insight to students' decisions to enroll in the degree completion program in agricultural leadership: able to be a full-time student and employee, able to complete degree without moving, and able to earn a degree in food and agricultural sciences. Findings suggest the online agricultural leadership degree completion is meeting the needs of Oklahoma agriculture and extends the land-grant mission by increasing accessibility to education to place-bound students seeking a four-year degree in food and agricultural sciences. Recommendations for recruiting and retaining students in online agricultural programs is provided.*

### **Introduction**

By 2020, 59% of jobs in Oklahoma will require a career certificate or college degree, however, only 30% of Oklahoma adults have an associate degree or higher. The resulting skills gap of 29% as reported by *Complete College America* (n.d.) requires college and universities to address the problem of degree completion. Furthermore, the Oklahoma Department of Commerce (n.d.) reports that one of the top five priority Oklahoma industry ecosystems is Agriculture and Biosciences. Not only is degree completion in Oklahoma of increasing importance, degree completion in the food and agricultural sciences is of vital importance.

A strong economy requires the skills gap be closed, and colleges and universities must take action. Nationwide, nearly half of undergraduate students enroll at a community college rather than a four-year institution when beginning their undergraduate study (American Association of Community Colleges, 2007). In response to the growing need to prepare college graduates for careers in food and agricultural sciences, faculty at Oklahoma State University (OSU) developed an online baccalaureate degree completion program in agricultural leadership. The project is funded through a United States Department of Agriculture (USDA) Higher Education Challenge Grant and aims to improve baccalaureate degree completion in the state of Oklahoma by delivering an online degree in the food and agricultural sciences in partnership with three regional two-year colleges.

The degree completion project was initiated by a conversation between Connors State College (Connors) and Oklahoma State University. Administrators and faculty at Connors asked OSU to better serve their place-bound students by offering a four-year degree program in the food and agricultural sciences that would not require their students to move to OSU's campus. Over a six-month period, faculty and administrators explored various options with the goal of meeting the expressed educational need. During this process OSU reached out to additional two-year colleges and discovered that students currently served by two-year schools across the state of Oklahoma and bordering Kansas communities were experiencing the same need. As a result, many students earning their associates of science degree in agriculture were not pursuing four-year degrees.

A 2013 report published by Oklahoma Department of Career and Technology Education (Snead, 2013) revealed an almost \$20,000 difference in income between associate degree and four-year college graduates. In 2014, only 24% of adults 25 and older in Oklahoma had earned at least a bachelor's degree (Ma, Pender, & Welch, 2016). The benefits of higher education extend beyond employment, as shown by the positive correlation between level of education and civic engagement: "Education prepares people to create successful and meaningful lives, to be active and engaged citizens in a democratic society, and to make choices that will improve their lives and the lives of those around them" (Ma et al., 2016, p. 9).

The need to provide greater access to four-year degree programs for Oklahoma students through innovation was supported by the *Transforming Agricultural Education for a Changing World* report published by the National Research Council (NRC) (2009):

To interest [community college] students in possible careers in food and agriculture, it will be essential for community colleges to offer programs in agriculture and to facilitate the transfer of community-college students into four-year agricultural degree programs. . . . Ease of transition from one institution to another, articulated courses that may eliminate coursework duplication, and active collaboration with complimentary institutions is essential. (pp. 84-85)

The NRC (2009) report goes on to say that "academic institutions may be able to do more with less by establishing multi-institutional partnerships in which they work together on programs of common interest" (p. 88).

Based on these findings, it was determined that an online baccalaureate degree in the food and agricultural sciences, specifically a B.S. in agricultural leadership, would position OSU to meet the expressed educational need. The B.S. in agricultural leadership serves students broadly and allows students to pursue and secure a wide-range of career paths in the food and agricultural sciences. Additionally, the agricultural leadership program already offers approximately half of the program's required courses in an online or short course format and is positioned to move to a program serving students throughout the region in collaboration with two-year schools.

### **Background of the Program**

To provide additional context, background of the agricultural leadership program at OSU, innovation and development of the online degree completion program, and aims of the awarded USDA Higher Education Challenge grant project are discussed.

The degree completion project in agricultural leadership is led by OSU in collaboration with Connors, Murray State College, and Northeastern Oklahoma A&M College, directly impacting the citizens of Oklahoma as it seeks to close the educational skills gap specifically in the food and agricultural sciences. Students study both leadership contextually grounded in the food and agricultural sciences as they prepare to serve as workforce leaders. Targeted prospective students are place-bound baccalaureate seeking students enrolling in agricultural leadership coursework across the state of Oklahoma and in bordering Kansas communities. The project objectives are: (1) to deliver a baccalaureate degree in the food and agricultural sciences serving place-bound students in the state of Oklahoma and bordering Kansas communities; (2) to academically prepare students for careers related to the food and agricultural sciences; (3) to convert, offer, and peer review 17 hours of agricultural leadership coursework in support of the degree completion program; (4) to promote the program at three two-year colleges; (5) to set the foundation for replication of the program at nine additional two-year colleges in the state of Oklahoma and bordering Kansas communities; and, (6) to disseminate the model used for the degree completion program to food and agricultural sciences programs across the nation.

The project is directly aligned with a commitment made by OSU in 2012. OSU, along with many other public college and universities, pledged to increase the number of students earning bachelor's degrees through the national program *Project Degree Completion* (Garmise, 2012). Among other specifics, schools pledged to (1) begin working more closely with two-year schools in STEM related fields; (2) reduce the time to degree completion thus reducing the cost to the student; (3) increase degree attainment by improving retention rates; and, (4) support efforts to prepare students to be college and career ready (American Association of State Colleges and Universities, n.d.). Additionally, the OSU strategic planning committee in 2015 approved a plan for the university based on the university's strong land-grant heritage. The committee created a vision for OSU scholars and researchers to "lead in the creation of a better Oklahoma, nation, and world by advancing the quality of life for all, and will fulfill the obligations of a first-class, land-grant educational institution" (OSU, 2015).

Potential outcomes/impacts of the four-year degree completion program include: (1) improving the number of students in the states of Oklahoma and Kansas completing baccalaureate degrees in the food and agricultural sciences, (2) enhanced student learning and leadership development in the food and agricultural sciences, and (3) agricultural students prepared as leaders for the food and agricultural sciences workforce. The American Association of State Colleges and Universities reports that "if the nation fails to advance the number of individuals obtaining postsecondary credentials, the medium to long-term economic costs to individuals, businesses and the overall economy will be severe" (Garmise, 2012, p. 1).

OSU recognizes its obligation to assist with the enrichment of as many people as possible, both in Oklahoma and nation-wide. The rich tradition of the land-grant university triangulates research, teaching, and extension so that new knowledge can continuously be discovered, passed on to students, and further infused into society. As Herren and Edwards (2002) wrote in their historical survey of land-grant origin and evolution, "Optimistically, the new concept of higher education in agriculture and the mechanic arts ushered in the need to create new knowledge that then could be applied to making life better for *all* citizens" (p. 95). The program seeks to improve baccalaureate degree completion in the food and agricultural sciences while preparing students to enter the workforce, thus, allowing OSU to coalesce its historic land-grant mission with its current strategic planning. In addition, the program aligns

with priority three of the American Association for Agricultural Education National Research Agenda, which challenges the agricultural education profession at-large to develop programs that will provide a sufficient scientific and professional workforce prepared to address 21st century challenges (Roberts, Harder, & Brashears, 2016).

### **Purpose**

The purpose of this study was to describe students' decisions to enroll in the baccalaureate degree completion program in agricultural leadership at OSU. The study was guided by the following research question:

1. What are the demographic characteristics of the initial cohort group
2. What reason(s) guided a student's decisions to enroll in the baccalaureate degree completion program in agricultural leadership's first cohort?

### **Methods**

Based in pragmatic theory, which aims to "seek practical and useful answers that can solve, or at least provide direction in addressing, concrete problems," (Patton, 2015, p. 152), a qualitative inquiry framed this study. A collective case study approach was employed to better understand students' decision to enroll in the degree completion program (Stake, 1995), as we were seeking "practical and useful insights to inform action" (Patton, 2015, p. 152). The first cohort of students to complete one year of coursework in the program were purposively selected for participation in this study. All students in the cohort ( $N = 12$ ) agreed to participate in semi-structured phone interviews, lasting 15 minutes on average. The interviews were conducted by a research team member familiar to the students, who served as a teaching assistant in the cohort's courses during the previous year. As part of the study's interview protocol, students were asked to describe why they chose to enroll in the program. Additional questions were asked as needed to clarify responses. The cohort responses were recorded without identifiable information in order to maintain confidentiality and increase trustworthiness between the researcher and participant.

Qualitative data were transcribed and triangulated with researcher field notes and member checking (Lincoln & Guba, 1985). After verification, qualitative data were interpreted for patterns and themes to draw conclusions. To maintain the cohort's voice, In Vivo coding was used as a first-round strategy (Saldaña, 2016). Codes were then charted to "scan and construct patterns from the codes, to develop initial assertions. . . and to explore the possible dimensions which might be found in the range of codes" (Saldaña, 2016, p. 229). Themes emerged through second cycle pattern coding and were negotiated by the research team members to best represent the voice and meaning in the findings (Saldaña, 2016).

### **Statement of Subjectivity**

While the study's findings provide insight into the motivations of students who may decide to enroll in an online degree completion program in agricultural leadership, the limitations of the findings are noted. It is recognized the experiences and meanings constructed by this study's student cohort may not represent all students who have enrolled or will enroll in online agricultural leadership degree programs. Nor, do the study's finding represent the factors

influencing the decision to enroll in online programs for all distance learners. The transferability of our findings should be considered by readers.

Potential biases in this study are also recognized by the research team. Investigation of the cohort's decisions to enroll in the program was conducted not only to improve marketing and recruitment efforts for the future programs, but also as a component of the initial program evaluation. Two members of the research team are faculty members in agricultural leadership, with over twenty years of teaching, research, and grantsmanship. One research team member, at the time of the study, is a Ph.D. student in agricultural education with an emphasis in leadership education. All research team members taught online coursework through the program, which established student-instructor relationships with the cohort prior to the study's interviews.

## Findings

### About the Cohort

The first student cohort in the agricultural leadership degree completion program represented a broad-range of adult learners. Students ranged in age from 20 years old to 39 years old, with 75% younger than 30 years of age ( $n = 9$ ). Two-thirds of the cohort were female (66.7%,  $n = 8$ ). Self-reported data obtained from university records identified 10 students as White (83.3%) and two students as American Indian or Alaska Native (16.7%). All students completed at least two years of coursework at a partnering in-state junior college. Over half of the cohort were first generation college students (58.3%,  $n = 7$ ). Two students (16.6%) had at least one parent with a four-year college degree. Three students had at least one parent that attended trade or technical school (25%). Proximity to OSU was variable among the cohort, with students residing 59 to 239 miles from the campus center ( $M = 149.5$ ,  $SD = 53.05$ ). Half of the cohort were married or engaged ( $n = 6$ ) and almost half had at least one child (41.6%,  $n = 5$ ). Nearly all students in the cohort worked full-time, defined as at least 40 hours per week on average (90.9%,  $n = 10$ ). The remaining students in the cohort worked part-time and/or volunteered at least 10 hours per week on average (9.1%,  $n = 2$ ). Professions of the cohort included sales, city government, banking, higher education staff, utility services, pharmacy technician, child services, and landscape maintenance. Family backgrounds of the cohort revealed a connection to family-owned agricultural operations for two-thirds of the students (66.7%,  $n = 8$ ). Other family professions included food manufacturing and service, nursing, agricultural education, business ownership and management, electrical systems, and cosmetology.

### Emergent Themes

Three emergent themes provide understanding and insight to students' decisions to enroll in the baccalaureate degree completion program in agricultural leadership at OSU. Students comprising the first cohort enrolled in the program because it provided the opportunity to be a *full-time student and employee, complete a degree without moving, and earn a degree in food and agricultural sciences*. Figure 1 provides a visual display of the cohort's reasons for enrolling in the agricultural leadership degree program. In the reporting of findings and data, pseudonyms are assigned to students to maintain participant confidentiality.

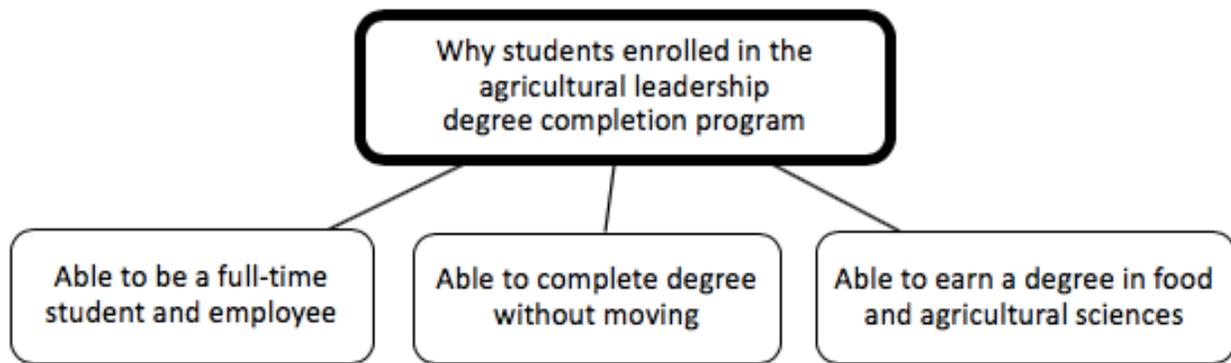


Figure 1. Three emergent themes, *able to be a full-time student and employee*, *able to complete degree without moving*, and *able to earn a degree in food and agricultural sciences*, describe the first student cohort’s decisions to enroll in the baccalaureate degree completion program in agricultural leadership at Oklahoma State University.

**Able to be a full-time student and employee.** For the program’s first student cohort, the decision to complete a bachelor’s degree in agricultural leadership online was guided by the opportunity to maintain full-time employment and be a college student full-time. As one student, Chris, plainly stated, *“I could work and get a degree.”* Another student, Katherine, echoed similar sentiments: *“I liked the fact the program was online. I could continue my job and it made it easier to finish a four-year degree. Convenience, for sure.”*

For some students, the ability to enroll as a full-time student while working was essential to their ability to complete a college degree. Established careers and new professional opportunities led students to perceive they were unable to move or attend college in the near future. Kelly, a non-traditional student in the cohort with an established career path in city government, explained her story:

*I wanted to finish my B.S. degree. I got an associates from NEO, then got married and had a baby. I couldn’t move and finish my B.S. degree after that. I learned about the program from my two-year college advisor back in 2015, finished a couple classes that needed to be retaken, and waited for the program to start.*

Another student, Alexa, felt enrolling in the program online allowed her to not have to choose between promising job opportunities and furthering her education: *“I got offered a position as a recruitment coordinator at my two-year college and needed to finish my bachelor’s degree, so it was the perfect option. I am able to finish the ag degree that I started at Murray.”*

In describing their reasons for enrolling the program, it was not unfamiliar for students in the cohort to reference the opportunity to *“finish what [they] had started”*. Whether it was continuing their education beyond an already-earned two-year degree or picking up in a four-year degree program where they had left off, the chance to complete a degree without forfeiting their current employment was enticing. David, a student in the cohort with a promising career in livestock sales, explained: *“A goal of mine was to get a bachelor’s degree but I was quitting on that goal. This gave me an opportunity to work all the time and go to school without being on campus away from work.”* Jason, a nontraditional student with less than 30 credit hours

remaining from earning a four-year degree, enrolled in the program because of the chance to finally finish his degree:

*I finished almost all the coursework for one [agricultural] major but didn't complete the degree. . . My advisor recommended the program, and after I talked [with my adviser] and did some research, I figured it would suit me just as well. . . I didn't come all this way for nothing.*

**Able to complete degree without moving.** The inability to uproot their family, careers, and personal responsibilities in their current community was a perceived reality for the program's first cohort. For some students, the decision to complete the online degree program was based predominantly on the needs of their family. *"I didn't want to leave my family's farm or because of my family's health. It made sense to stay near home,"* stated Rachel. Similarly, another student, Bailey, spoke of her role in caring for an ailing grandmother full-time at home while being enrolled in college.

For other students, simply moving away from home was not a reality. *"I couldn't move away to finish my bachelor's degree,"* Alexa remarked. Kathy, both a sales professional with a family-owned cattle company and grandmother, said she enrolled in the program *"because it was an ag degree, it was at OSU and 100% online. There was no way working full-time and running a ranch I could come to campus."* For John, enrolling in the program online removed the obstacles preventing him from completing his four-year degree:

*There's no way I can go to Stillwater because I am too rooted here. There's too much here for me to just pack up and live near campus. It wasn't realistic. The fact that I can do everything online and still get what I need is perfect.*

In similar fashion, the online program provided students an opportunity to complete their degree when unforeseen events changed their original college plan. One student, Sarah, had previously considered moving to Stillwater to complete a degree as full-time on-campus student. But, after finding out she was expecting a child, Sarah jumped at the chance to complete the online agricultural leadership degree. *"I decided to enroll in the program because I could get a degree and be home with my daughter while doing it,"* reflected Sarah. Another student, Paige, had actually been a traditional on-campus student in agriculture at OSU when a change in her father's career caused her family to move out of state. When she learned about the program, it was perfect timing; the decision to complete the online agricultural leadership degree program provided Paige's the chance to remain a full-time, in-state student at OSU and on track for graduation, saving tuition dollars in the long-run, while also giving the flexibility for her to live at home with her younger brother during his senior year of high school.

**Able to earn a degree in food and agricultural sciences.** Underlying students' desire to work full-time and remain local while enrolling as a college student full-time, the ability to earn a degree in food and agricultural sciences was a common deciding factor for the cohort to be in the agricultural leadership degree completion program. It appeared getting a four-year degree in agriculture was just as important to most of the students in the cohort as were the other deciding factors. Even though she had experienced much success in her current sales profession for more than 10 years, Kathy desired to eventually transition into agricultural sales and felt the degree in agricultural leadership would be beneficial. For Chris, enrolling in the online degree completion

program was an easy decision because *“this was an ag degree, which fit since [he was] already working in agriculture.”*

Some students even saw the online degree completion program in agricultural leadership as an opportunity to complete a relevant four-year degree that would support their goal to be alternatively certified as an Oklahoma secondary agricultural education teacher. *“If I can pass the [teaching certification] tests then I can still use this degree to teach,”* said Jason. Similar sentiments were shared by John, who said, *“I’d like to be an ag teacher but there’s no way I can go to Stillwater.”* Others, who perhaps had original goals to be an agricultural educator but changed career paths, saw it as a way to re-enter the agricultural field through a closely-related agricultural degree program. *“Originally I wanted to be an ag teacher . . . Before, I debated about getting an elementary education degree but I knew I wouldn’t be satisfied because it wasn’t ag,”* said Katherine.

Although not every student based their decision to enroll in the program on a specific job or career, the aim to get a degree in food and agricultural sciences was apparent, as shown by Sarah’s explanation: *“I don’t know what I want to do when I finish but I wanted to get a degree in agriculture.”* Alexa saw the degree completion program as *“a huge blessing in disguise because [she] couldn’t move away and wanted to finish the ag degree [she] started at Murray.”* The availability of four-year food and agricultural sciences degrees from regional universities and colleges in Oklahoma is limited, yet the demand from students seems to exist. The agricultural leadership degree completion program provided the place-bound cohort an opportunity to earn a four-year college degree in the discipline they desired, food and agricultural sciences. In line with the land-grant mission to provide accessible education, the degree completion program extends food and agricultural sciences education beyond the limits of Stillwater to the citizens of Oklahoma.

## **Conclusions and Discussion**

Based on the findings of this study, the opportunities to complete a degree in food and agricultural sciences while working full-time and without moving to main campus led students in the first cohort to enroll in the baccalaureate degree completion program in agricultural leadership. With nearly all students employed full-time, it was important for degree completion students to be able to maintain their current position while completing coursework. When the project was initiated, faculty expected students to be working part-time in addition to enrolling in coursework, but were surprised by the majority of students employed full-time in professional positions. In addition to working full-time, the cohort as a whole was interested in completing their baccalaureate degrees quickly. Many enrolled in school full-time requiring the program to make available sufficient online credits for cohort students. Whether it was at full-time or part-time status, however, the ability to work toward and complete their four-year degree while continuing to earn a living was a driving force in the cohort’s decision to enroll in the degree completion program.

Additionally, family, career, community, and personal responsibilities were perceived obstacles preventing the cohort from enrolling at OSU as a traditional on-campus undergraduate student. By removing this barrier, the degree completion program allowed the cohort to accomplish their goal of earning a four-year degree in the food and agricultural sciences. Prior to the program, faculty assumed most place-bound students simply did not want to move away

from home; however, the reasons described by the cohort revealed a more complex dynamic. Students' commitment to their families and communities prevented them from uprooting established careers, businesses, and relationships to attend a four-year college. The online degree completion program gave the cohort the best of both worlds: the chance to receive a four-year degree from OSU while preserving their local and familial connections.

A significant factor influencing the cohort's decision to enroll in the degree completion program was the discipline of the degree itself. Students *wanted* to earn a four-year degree in food and agricultural sciences, but local programs in agriculture were limited to two-year colleges and majors available at regional four-year schools did not offer options in the agricultural sciences. The online agricultural leadership baccalaureate degree provides an accessible four-year degree in food and agricultural sciences to meet the needs of the state's agriculturally-based workforce, which is estimated at over 188,000 jobs (Oklahoma Farm Bureau Foundation for Agriculture, 2018). The USDA's employment outlook for 2015-2020 reflects a similar demand nationwide:

College graduates with expertise in food, agriculture, renewable resources, and the environment are essential to our ability to address the U.S. priorities of food security, sustainable energy, and environmental quality. Graduates in these professional specialties not only are expected to provide answers and leadership to meet these growing challenges in the United States, but they also must exert global leadership in providing sustainable food systems, adequate water resources, and renewable energy in a world of population growth and climate change. (Goecker, Smith, Fernandez, Ali, & Goetz, 2015, p.1)

The degree completion program in agricultural leadership provided an opportunity for future agricultural leaders to obtain a baccalaureate degree while maintaining full-time employment, living at home and fulfilling personal responsibilities outside of work and school. According to the *Online College Students* report (Aslanian & Clinefelter, 2012), nearly 60% of undergraduate students in online programs are full-time status. Online degree completion programs can provide students the flexibility to complete a four-year degree at a pace best suited for their individual circumstances.

### **Recommendations**

With the goal of fulfilling the mission to extend educational opportunities in service to all, land-grant institutions should consider moving baccalaureate education beyond the confines of the traditional campus-based classroom. By exploring why students specifically decided to enroll in the baccalaureate degree completion program in agricultural leadership, faculty hope to be able to target and recruit future students to increase the sustainability of the program and ultimately increase the number of baccalaureate graduates in the food and agricultural sciences. The program's first cohort will graduate four students during the 2018-2019 academic year. It is recommended that the first cohort be followed through graduation and beyond, seeking to uncover why students persist in the program and the future impact graduates have on the agricultural industry. Similar research is recommended for future cohorts including the second cohort of students enrolling fall 2018. Additional areas of interest include satisfaction of students

specifically related to the online environment, an assessment of learning outcomes, and, a comparison of degree completion students in agricultural leadership to traditional students in agricultural leadership. The possibility of expanding the online degree completion program to other food and agricultural sciences disciplines could also be explored.

## References

- American Association of State Colleges and Universities. (n.d.). *Project degree completion: A public university initiative*. Retrieved from <http://www.aascu.org/members/ProjectDegreeCompletion/>
- Aslanian, C. B., & Clinefelter, D. L. (2012). *Online college students 2012: Comprehensive data on demands and preferences*. Louisville, KY: The Learning House, Inc. Retrieved from <https://www1.udel.edu/edtech/e-learning/readings/Online-College-Students-2012-Survey.pdf>
- Complete College America. (n.d.). *Oklahoma 2011*. Retrieved from <http://completecollege.org/>
- Garmise, S. (2012). *Project degree completion: Building our future*. American Association of State Colleges and Universities. Retrieved from <http://www.aascu.org/projectdegreecompletion/buildingourfuture/>
- Goecker, A. D., Smith, E., Fernandez, J. M., Ali, R., & Goetz, R. (2015). *Employment opportunities for college graduates in food, agriculture, renewable natural resources, and the environment* (National Institute of Food and Agriculture, U.S. Department of Agriculture, Award No. 14-38837-22371). Retrieved from <https://www.purdue.edu/usda/employment/wp-content/uploads/2015/04/2-Page-USDA-Employ.pdf>
- Herren, R. V. & Edwards, C. (2002). Whence we came: The land grant tradition – Origin, evolution, and implications for the 21st century. *Journal of Agricultural Education*, 43 (4), 88-98. doi:10.5032/jae.2002.04088
- Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: SAGE Publications.
- Ma, J., Pender, M., & Welch, M. (2016). *Education pays 2016: The benefits of higher education for individuals and society*. The College Board. Retrieved from <https://trends.collegeboard.org/sites/default/files/education-pays-2016-full-report.pdf>
- National Research Council. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- National Research Council. (2009). *Transforming agricultural education for a changing world*. Washington, DC: The National Academies Press. Retrieved from <http://www.nap.edu/catalog/12602.html>
- Oklahoma Department of Commerce. (n.d.). *Industry sectors & largest employers: Agriculture & bioscience*. Retrieved from <https://stateofsuccess.com/industries/agriculture-bioscience/>

- Oklahoma Farm Bureau Foundation for Agriculture. (2018). *Oklahoma agriculture at a glance*. Retrieved from <https://okfbfoundationforagriculture.org/oklahoma-agriculture-at-a-glance/>
- Oklahoma State University [OSU]. (2015). *Oklahoma State University strategic plan*. Retrieved from <https://president.okstate.edu/okstate-strategic-plan>
- Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4<sup>th</sup> ed.). Thousand Oaks, CA: 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.
- Russon, C. & Reinelt, C. (2004). The results of an evaluation scan of 55 leadership development programs. *Journal of Leadership and Organizational Studies*, 10(3), 104-107. doi:10.1177/107179190401000309
- Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Thousand Oaks, CA: SAGE Publications.
- Snead, M. C. (2013, March). *The economic contribution of CareerTech to the Oklahoma economy: Cost-benefit analysis of career majors (FY11)*. Oklahoma City, OK: Oklahoma Department of Career and Technology Education. Retrieved from <https://www.okcareertech.org/about/cost-benefit-analysis-of-career-majors/cost-benefit-analysis-of-career-majors-fy-11-pdf>
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: SAGE Publications.

## **Discussant Remarks**

### **There's No Place Like Home: Why Students Enrolled in an Agricultural Leadership Degree Completion Program**

Discussant: Ed Osborne, University of Florida

This paper reported the findings of a very practical study designed to examine the motivations for enrolling in a new online four-year agricultural leadership degree program that targeted students holding two-year degrees in agriculture. The twelve members of the initial cohort participated in a phone interview. Three anticipated themes for enrolling in the online degree program emerged from the data: ability to remain employed full-time, accessibility from their current location, and opportunity to earn a four-year degree in agriculture. The students participating in the study were employed in a wide variety of employment sectors.

The authors nicely summarized the economic and other advantages of holding a four-year versus two-year college degree. They also cited data indicating that a relatively small percentage of the state's resident adults hold at least a bachelor's degree. However, little previous research was presented on the reasons that students seek four-year degrees in agriculture. The idea of targeting students in this study who held two-year degrees in agriculture from a small number of state colleges was an excellent way to explore the potential of this new program. The approaches taken in the study generally followed standard qualitative research protocols. However, the TA who taught these students in one or more of the leadership courses conducted the phone interviews, which may have affected how students responded to the interview questions. Also, these students were in the middle of their degree program and would presumably have this TA for future courses. Including a clearer theory base in the manuscript, perhaps by framing the investigation in evaluation, curriculum development, or student development theory, would have strengthened the foundation of the study. Additionally, the researchers missed an opportunity to examine how well students were managing the online program on top of their work and family obligations. Some had not been in school for some time and may not have enrolled in online courses before this program.

The study prompted a number of intriguing questions worth further consideration, including the following:

1. Beyond the 17 credits in agricultural leadership courses, what other courses were included in the program? Were other courses in the agricultural sciences available or required? Were other four-year online degree programs offered by other departments in the college?
2. Why was a degree program in agricultural leadership seen as the best program to meet the need for more four-year degrees in agriculture in the state?
3. Did the students want a four-year degree in agricultural leadership, or were they simply pleased with the opportunity to obtain a four-year degree in agriculture? How relevant did they view the agricultural leadership degree to their future career interests?

Overall, this was a very interesting study that provided useful information on the value of a new online degree program for this specific target audience.

## **Does Experiential Learning Improve Student Performance in an Introductory Animal Science Course?**

Eric D. Rubenstein, University of Georgia  
Savannah R. White, University of Georgia  
C. Robert Dove, University of Georgia  
T. Dean Pringle, University of Georgia

### **Abstract**

*At postsecondary educational institutions, the learning process has lecture at the focal point of most courses, for-going experience and hands-on learning for the more efficient lecture-based model of teaching. A general consensus exists among educators that motivation and student engagement can be difficult, but remain a crucial part of planning and teaching. Hands-on experiences can be used to motivate students and allow them to gain problem-solving and critical thinking skills. Therefore, the purpose of this study was to investigate the influence experiential learning had on students enrolled in a large lecture introductory animal science course at [University]. This quasi-experimental study split the students enrolled in the course into two groups to determine if experiential learning had a positive influence on the students learning. The experiential learning activities were designed to replace a two-hour study session held each week during the semester. Student performance was measured by the scores on the course summative assessments. The first quiz scores were analyzed by group to determine if a difference was found between the groups. There was no significant difference ( $p = 0.60$ ) found between the two groups on the first quiz. The researchers found that no significant differences were found between the groups of students on questions related to the four content areas. Therefore, the researchers concluded that experiential learning may not have a positive impact on all learning experiences for students. Therefore, more research should examine the utilization of experiential learning on the teaching of introductory content material to college students.*

### **Introduction and Review of Literature**

Kolb explained learning as, "...the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p 41). At postsecondary educational institutions, the learning process has lecture at the focal point of most courses, for-going experience and hands-on learning for the more efficient lecture-based model of teaching. For-going experience-based learning leaves a gap in the development of underclass students at a postsecondary level. According to Kolb, "Knowledge results from the combination of grasping experience and transforming it" (Kolb, 1984), implying that learning cannot occur through presentation alone; transformation or experience with the material is required for true knowledge acquisition. Healey and Jenkins (2007) implemented experiential learning in geography in higher education. In their article, the authors outlined strengths that Kolb's conceptual frame has for postsecondary institutions. Among the strengths was the benefit of implementing experiential learning into an entire degree program but starting off with one course or class session can be equally beneficial for students (Healey & Jenkins, 2007). Students come to a classroom with different learning styles and adaptive natures, but Mainemelis, Boyarzis, and Kolb (2002) make note that both

internal factors, i.e. learning styles, work with external factors to create intelligence. Mainemelis, Boyarzis, and Kolb (2002) stated, "Intelligence is thus the result of the dialectic integration of internal cognitive organization, reflective abstraction, and external adaptation, active involvement in experience" (p 7). John Dewey (1938) was the first academic to connect education with experience but warns against the concept that not all experiences are education, which was later explained by Kolb (1984) in his experiential learning model. Dewey (1938) acknowledges that students already have experiences in classrooms, but those experiences lack the depth and character to be learning experiences. In order for students to have meaningful learning experiences, educators must vary instruction, incorporate hands-on learning and purposefully plan experiences so students can reach every stage of Kolb's Experiential Learning Theory. In this research, experiential learning experiences were incorporated into a lecture-based college introductory course to increase student's comprehension of basic animal science topics.

### **Experiential Learning**

A general consensus exists among educators that motivation and student engagement can be difficult, but remain a crucial part of lesson planning and teaching. Hands-on experiences can be used to motivate students and allow them to gain problem-solving and critical thinking skills, which, "These skills may be acquired through acquired through participation in experiential learning activities" (Rhykerd, Tudor, Wiegand, Kingman, & Morrish, 2006). Rhykerd et al. (2006) implemented a hands-on contest with crop production and marketing to help students without an agriculture background gain real life experience that they can apply to their future careers. The researchers created the contest to be, "...based upon pedagogical research that supports the theory that student comprehension is increased through critical thinking exercises and application of course concepts to real-world situations" (Rhykerd et al., 2006). Through qualitative analysis of the participation, researchers noted a "...positive impact on their knowledge..." (Rhykerd et al., 2006).

Hands-on experiences in science classes are often in the form of laboratory experiences. Stor-Hunt (1996) elaborated on active learning in science courses being predominately laboratory experiences, which were created at the end of World War II, when the national government began to finance science education. Stor-Hunt examined test scores of middle school science students who were engaged in hands-on activities either frequently, infrequently or never to determine if the activities benefitted the student's science achievement. Their results show that students who were in hands-on activities frequently scored higher on science exams, which the researcher says, "...the frequency of hands-on experience was strongly related to science achievement even when the test was not focused specifically on science process outcomes" (Stor-Hunt, 1996). Stor-Hunt (1996) goes more in-depth with her review of hands-on learning emphasizing the importance that the focus be placed on student experience over teacher experience and motivation and student focus is inherently needed for the experience to be meaningful.

An increase in student achievement is not the only notable benefit to hands-on experiences. Johnson, Wardlow, and Franklin (1997) researched the potential benefits provided to students with hands-on reinforcement, instead of worksheets. Enderlin and Osborne (1992)

stated, “changes are needed in agricultural education in order to increase students' inquiry skills and understanding of scientific principles as they relate to agriculture” (as cited in Johnson et. al, 1997, pp 9 - 10). The researchers concluded, “...that hands-on activities were superior to worksheets in developing positive student attitudes toward academic subject matter” (Johnson et al., 1997, ). Researchers concluded from their study that educators need to expand the use of hands-on activities to boost student outcomes and science education can influence and inform agriculture educators. One of the main reasons science education can inform agriculture education is the current trend towards science-based methods in the field. The researchers encourage more research to be done within the field, especially about the effectiveness of certain instructional methods (Johnson et al, 1997). Osborne (1993) elaborated on the distinct change towards science-based methods in agricultural education through agriscience. He stressed the importance of an incorporation of science into the agriculture industry. Osborne (1993) stated, “our job is not to duplicate science instruction offered by science departments. Our job is to teach science in a different way, focusing on applications of science in all facets of the broad agricultural industry” (p 3). A shift towards agriscience and using scientific methods and principles in agriculture education requires a focus on active learning through hands-on activities.

### **Active Learning**

There is an apparent shift in higher education towards activities and group-based learning and away from lecture-based classes. This shift in the teaching paradigm is acknowledged and explained by Barr and Tagg (1995). In their article, they question the effectiveness of lecture-only classes, “The Instructional Paradigm” and offer a different approach, “The Learning Paradigm” (Barr & Tagg, 1995). Their Learning Paradigm’s goal is to produce learning, instead of providing instruction. Their arguments center around the ineffectiveness of lecturing alone, stating that the main evaluation is on the professor’s preparedness and teaching, instead of the student’s learning. Their Learning Paradigm flows into active learning.

Active learning is a new instructional method being used in flipped classrooms. Prince (2004) defines active learning as, “...any instructional method that engages students in the learning process...requires students to do meaningful learning activities and think about what they are doing”. He continues to elaborate on the methodology by giving examples of different examples of active learning, specifying that, “...in practice active learning refers to activities that are introduced into the classroom” (Prince, 2004, p 223). The core elements Prince (2004) emphasizes are student activity and engagement in their learning process. Roehl et al. (2013) analyzed a flipped classroom as a technique to engage millennial-aged students. The flipped classroom they describe includes using active learning strategies. Roehl et al. (2013) stated that “Assimilating active learning can be as simple as integrating in-class activities alongside traditional lecture” (p 45). In their description of the active learning process, Roehl et al. list benefits for students, including, “...students may develop higher order thinking skills and creativity” (p 48). Cotton and Shelton (2013) brought active learning to their introductory geology class to demonstrate sustainable agriculture and science to non-science majors. In their research, they brought a laboratory-based research project to students in an introductory level

course to increase student's confidence and knowledge about science and scientific methods. In their introduction, they acknowledge that few studies were found to have tried integrating laboratory research projects as active learning activities in a course, but many studies have sought to increase knowledge retention in large enrollment classes through various active learning methods (Cotton & Shelton, 2013). From their research, Cotton and Shelton (2013) were able to conclude that students had learned enough about sustainability, that they were able to discuss it with their friends and family, "...which demonstrates that this class project was successful at increasing science literacy among non-science majors" (p 66). They had positive feedback from students which showed them that, "...this activity is an effective way to incorporate active learning techniques to engage students of all levels...but may be more useful for engaging students at the introductory level" (Cotton & Shelton, 2013, p 66). More studies need to be conducted to examine the effects active learning has on student's test scores, but Cotton and Shelton (2013) suggest that student performance was improved through the active learning process.

### **Characteristics of Experiential Learning Theory**

A. Kolb and D. Kolb (2005) clarify that experiential learning is not a technique taught to students or a mindless reflection on experience, but rather a philosophy of education. A. Kolb and D. Kolb (2005) describe the Experiential Learning Theory with six significant characteristics:

1. Learning is best conceived as a process...
2. All learning is relearning. Learning is best facilitated by a process that draws out the students' beliefs and ideas about a topic so that they can be examined, tested, and integrated with new, more refined ideas.
3. Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world...
4. Learning is a holistic process of adaptation to the world...
5. Learning results from synergetic transactions between the person and the environment...
6. Learning is the process of creating knowledge...

Two characteristics are of importance for this study. Kolb (1984) describes the two characteristics as learning is best described by the process, not the outcomes and learning is a continuous process grounded in experience (Kolb, 1984). Kolb (1984) states, "The emphasis on the process of learning as opposed to the behavioral outcomes distinguishes experiential learning from the idealist approaches of traditional education" (p 26). Learning, in terms described by Kolb, cannot be separated from experience. Participants, or learners, are required to go through the experiential learning cycle of experience, reflection and generalization with every interaction, in order for the theory to take hold (Roberts, 2006). The process, like Kolb's second characteristic, is continuous, and the learner cannot separate oneself or individual components from the cycle. Experience is not the only key component of ELT is learning styles. There are four learning styles: divergers, assimilators, convergers, and accommodators. Each learning style is different but can be accommodated by Experiential Learning Theory (Healey & Jenkins, 2007).

### **Applications of Experiential and Active Learning in Agriculture Classrooms**

Educators and researchers have argued back and forth about the proper pedagogical methods to use to teach students, either side defending their preferred methods claiming that their method increases student motivation, creativity, test scores and more. Agriculture classrooms and laboratories have used experiential learning as a foundational component for numerous years. Students must experience each of the four stages of Kolb's Experiential Learning Theory (1984), to truly learn using experiential learning theory. Shoulders and Myers (2013) examined teachers' use of the learning stages in agriculture laboratories. In their study, they concluded that guiding students through the four stages can enhance their learning in lab settings, increase science literacy and higher-level thinking, even though laboratory settings have been previously associated with only development of psychomotor skills. Although the researchers acknowledge the potential benefits, they concluded that most educators were not engaging their students in all four of the stages, so the potential benefits were not being reaped (Shoulders & Myers, 2013).

Shoulders and Myers (2013) were not the only researchers who looked at Kolb's ELT and the success of students in agriculture classrooms. Baker and Robinson (2016) examined an important pedagogical approach used in agriculture education, experiential learning. Their research observed the successful intelligence of students, who have experienced experiential learning. Baker and Robinson (2016) concluded that students who had the experiential learning treatment scored higher on domain-specific creativity and practical use of knowledge, but students who did not receive the treatment scored similar scores on analytical knowledge. Based on their results, they suggest a blended approach to classroom instruction. Baker and Robinson (2016) elaborate saying, "...combination produces successful student intelligence most effectively..." (p 139). They warn against the harm of homogenizing courses, citing that it can reduce the number of opportunities for students to develop cognitive skills in all four stages of Kolb's ELT. The researchers outlined the following recommendation, "...educators must understand how to utilize various teaching methods to guide students through each of the four modes of learning to achieve the results noted in this study. The training should include the development of educators' ability to serve in the facilitator, expert, evaluator, and coaching roles effectively" (Baker & Robinson, 2016, p 139). Direct instruction is not shown to be an adequate teaching method when used alone. A good educator will blend methods. The researchers went on to highlight the need for experiences and class instruction to be purposefully planned and be high quality, regardless of the teaching method used. Baker and Robinson (2017) continued their research in an experiential learning approach in agriculture classrooms in regard to student motivation. From their research, they were able to conclude that instruction type does not alter student motivation and learning style plays a role in motivation. In their recommendations, they re-emphasized the need for varied instruction to reach students in all learning styles, as well as adequate planning and delivery (Baker & Robinson, 2017).

### **Gaps in the Literature**

A level of accountability existed in incorporating experiential learning into college level courses (Caulfield and Woods, 2013). Studies have shown positive outcomes of experiential learning of internships (Esters and Retallick, 2013), study abroad (Ingraham and Peterson, 2004), and work-study programs (Ambrose and Poklop, 2015). However, few exist surrounding

implementation of experiential lessons into large, introductory science courses in a university setting. Healy and Jenkins (2000) recommended that research in geography education should examine whether “students in higher education in the early twenty-first century have a predominant learning style” (p. 193) in respects to validating the incorporation of experiential learning in a university setting. Another study suggested an examination of experiential learning “in which students are randomly assigned situations of more/less depth and breadth to eliminate any biases of self-selection, demographics, and so on” (Coker, Heiser, Taylor, and Book, 2017, p 21). This study aimed to bridge the gap in the literature by integrating experiential education lessons into a large introductory animal science course and examining impacts on student academic achievement on course tests following the experiential education lesson.

### **Applications of the Experiential Learning Theory in Higher Education**

As mentioned before, hands-on, experienced-based learning is pushed aside for the more efficient lecture-based methods. Healey and Jenkins applied experiential learning in collegiate level university courses. The researchers applaud the theory for being easy to well-developed, understandable and its generalizability over single classes or entire degree programs (Healey & Jenkins, 2007). Mainemelis, Boyarzis, and Kolb (2002) implemented experiential learning in regard to learning styles, which is known as "integrated learning"; they describe integrated learning as, "...a process involving a creative tension among the four learning modes that is responsive to contextual demands" (Mainemelis, Boyarzis & Kolb, 2002, p 6). The results of their study with MBA students show that individuals who demonstrated adaptability and flexibility had better skill development through experiential learning dialectic. Barron, Khosa, and Jones-Bitton (2017) compared experiential learning and veterinary students' confidence in their client communications. The students were exposed to real-life appointments, under the supervision of licensed veterinarians. The students talked through diagnosis and client concerns at appointments, see through all surgical procedures and treatments for their diagnosis. The clinical practice took place during their final year of school for three weeks. The results of their study indicate that the experiential learning process of experience, reflection, and generalization-increased student's confidence. From the study, researchers deduced that "The significant results...support that an experiential learning environment can promote and significantly influence students' confidence in applying an integrated approach to communication skills and clinical skills..." (Barron, Khosa & Jones-Bitton, 2017).

Overall, to create learning experiences for students, educators need experiential learning coupled with other pedagogies. Varying instruction allows educators to meet the needs of all students while increasing higher-level thinking and cognitive skills. Not only do educators need to vary instruction, but they need to be purposeful and diligent in planning and quality of instruction. Through planning and quality delivery, educators will ensure that students will have the opportunity to reach each stage of Kolb's Experiential Learning Theory: experience, reflection, and generalization. When students complete the ELT cycle, they benefit from learning experiences.

### **Conceptual Framework**

The process of experiential learning has a perspective that “...emphasizes the central role that experience plays in the learning process” (Kolb, 1984, p 20). Experiential learning is used to solidify learning experience through four stages: concrete experience, reflective observation, abstract conceptualization and active experimentation (Kolb, 1984). True learning occurs when individuals have the chance both the experience, as well as the reflection and transformation of the knowledge (Kolb, 1984). The transformation can be seen in classrooms when students are tested on the knowledge created in experiences. Experiences can be created in classrooms through hands-on activities that are coupled with other teaching methods to help students in all four learning styles. The four learning styles are assimilating, converging, accommodating and diverging (Kolb, 1984). Assimilators learn when sound logical theories are presented to them. Convergents learn best with practical applications of concepts. Hands-on experiences are best for accommodators and divergers prefer a wide range of information available (Kolb, 1984). All the learning styles described by Kolb can be accessed through experiential learning of blended teaching methods. Kolb (1984) outlines six characteristics of experiential learning. Learning is:

1. Described best as a process, not an outcome
2. Continuously grounded in experience
3. Requires the resolutions of internal conflicts with external stimuli
4. A process of adapting to external stimuli
5. Interactions between the person and the environment
6. The process of creating knowledge

Overall, experiential learning is the creation of knowledge through meaningful experiences with blended teaching methods in post-secondary education classrooms.

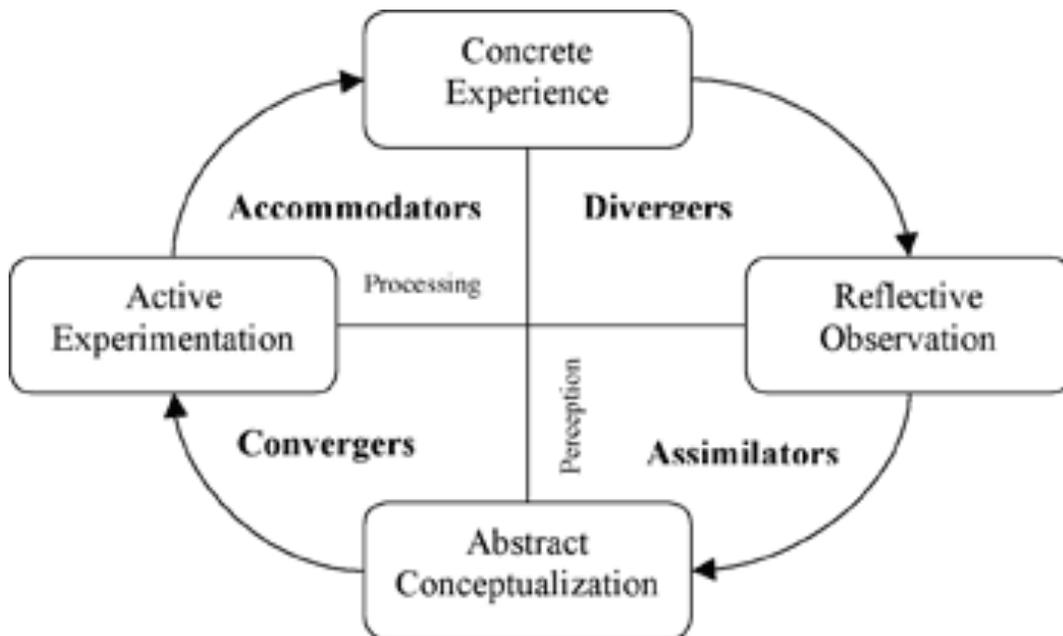


Figure 1: Kolb’s experiential learning model with learning styles. The figure shows the four steps individuals need to experience for knowledge creation to occur.

## Purpose and Objectives

The purpose of this study was to investigate the influence experiential learning had on students enrolled in a large lecture introductory animal science course at [University]. The National Research Agenda called for research to investigate learning to ensure that graduates are prepared for the 21<sup>st</sup>-century workforce (Roberts, Harder, & Brashears, 2016). This study was guided by the following research question:

- Describe the effect of experiential learning activities on student comprehension of content taught in an introductory animal science course.

This study utilized this null hypothesis:

Ho: Students who engaged in experiential learning activities will have a higher mean score compared to those who did not engage in the same activities on the course summative assessments.

## Methods and Procedures

This study was conducted utilizing a quasi-experimental design to ensure that all students in the course were granted the same opportunities and to reduce any effects from this population not being randomized (Campbell & Stanley, 1963). According to Campbell and Stanley (1963), quasi-experimental design studies should utilize a crossover method to ensure that multiple data points are collected from each student in the population. Therefore, the researchers broke the course into four sections and alternated the utilization of experiential learning activities to each of the two groups (See Table 1).

Table 1

### *Experimental Treatments by Group*

Content Area	Group	Treatment
Reproduction	A	Experiential
	B	Control
Nutrition	A	Control
	B	Experiential
Genetics	A	Experiential
	B	Control
Meats	A	Control
	B	Experiential

## Course Description

At the [University], the laboratory component of the Introductory to Animal Science course was removed from the course nine years ago to help alleviate teaching overloads and budgetary constraints. Therefore, for the past nine years, the course has been taught as a

standalone lecture-based course utilized to teach the basic animal science material all students need to comprehend prior to taking more advanced courses. The faculty who have taught the course have extensive experience in teaching laboratory classes and have attempted to enhance their classroom instruction in this course to provide students with a better learning environment. The class meets three times a week for a 50-minute lecture and students were offered a once a week study session that could last up to two hours.

### **Study Design**

The students were split into two randomly assigned groups to ensure variability of the groups. One experimental treatment was designed for this study. The experiential learning treatment was designed to give the experiential treatment group two experiential learning laboratories per unit. Each laboratory activity was designed utilizing Kolb's experiential learning phases to ensure students moved through each level during the laboratory segment. The laboratory activities were planned to take 105-minutes to ensure that there was time for questions and further explanation for students without exceeding the 120-minute class period. When the students were in the group receiving no treatment, the students still met with TA's to review content during a study session. This review was led by student questions to create buy-in from the students attending. Further, attendance was taken during each meeting to verify if someone had received the specific treatment. If they missed an experimental treatment then they were removed from the study.

### **Data Collection**

Data were collected through the course summative assessments (unit exams and final exam) that were created by the faculty in the animal science department. The objectives of this class were written at a understand level on Blooms Taxonomy (Krathwohl, 2002) rather than at the analysis and evaluate levels (Krathwohl, 2002), the level at which the experiential learning activities were designed to target. Summative assessments were given during a designated test session that was either two hours in length for a unit exam or three hours in length for the final exam. Assessments included a variety of multiple choice, true/false, and short answer questions. Assessments data were then entered based on if the students' response was deemed to be correct by the content experts. Data were then analyzed using SPSS version 25 with an *a priori* level of .05.

### **Results**

Prior to the beginning of the study, the first quiz scores were analyzed by group to determine if a difference was found between the groups. There was no significant difference ( $p = 0.60$ ) found between the two groups on the first quiz. Therefore, the groups were deemed similar and the study groups were deemed appropriate for this study. Mean scores between the groups varied in regards to the difference between the mean scores, with the largest difference being between the groups in regards to the reproduction content area. The treatment group mean scores was 40.33 ( $SD = 4.21$ ) and 39.33 ( $SD = 3.55$ ) for the control group. Table 2 displays the mean scores for content area based upon group assignments.

Table 2

*Student Assessments Mean and Standard Deviations for Each Content Area*

Content Area	Group	n	Mean (SD)
Reproduction	Experiential	39	40.33 (4.21)
	Control	42	39.33 (3.55)
Nutrition	Experiential	42	42.43 (4.46)
	Control	39	43.13 (4.62)
Genetics	Experiential	39	37.77 (3.67)
	Control	42	37.17 (3.99)
Meats	Experiential	42	13.52 (2.71)
	Control	39	14.05 (2.84)

To further examine the data, an independent sample t-test was run to determine if significant differences existed between the control and experimental groups for each content area. The independent samples t-test showed that no significant differences were found between the control and experimental groups on the four content questions. Further examination was conducted at the question level and found that only 4 total questions were found to have a significant difference at the .05 level. Table 3 displays the results of the independent samples t-test for each content area.

Table 3

*Independent Samples t-test – Mean Scores on Each Content Area Between Groups*

Content Area	<i>F</i>	<i>t</i>	<i>df</i>	<i>p</i>
Reproduction	.71	1.15	74.59	.25
Nutrition	.13	.69	78.05	.49
Genetics	.08	.71	78.99	.48
Meats	.41	.86	77.84	.40

### Conclusions

Based on the results of the study, the researchers reject the null hypothesis. Although the study found that there were no significant differences in teaching methods between lecture and experiential learning activities. The nature of the course was to create a baseline of knowledge for students to continue in their degree program where further experiential learning activities were used more frequently. During the lecture component of the course, knowledge was created at the understanding level of Bloom's Taxonomy (Krathwohl, 2002); the hands-on experiential components of the course created knowledge at the analysis and evaluation level (Krathwohl, 2002). The discrepancies between the exam questions and the knowledge presented in the laboratory sessions should be noted. As a whole, there was no significant difference in

knowledge comprehension between the control and experimental groups, but some individual questions may reflect a benefit in hands-on experiences for some content areas.

Experiential learning is a beneficial teaching method that uses hands-on experiences to create knowledge. These experiences can be beneficial to all students, regardless of their learning style (Mainemelis, Boyarzis, & Kolb, 2002). However, introductory material can be presented to students in a lecture form, while more complex topics could potentially be more beneficially presented through experiential learning activities. Further, the instructors of the course utilized their personal experiences within the animal science field to provide real-world examples for students to imagine the practicality of the content being taught. Therefore, the researchers conclude that true engaging lecture can be an effective tool in college classes (Estepp, Shelnett, & Roberts, 2014).

### **Recommendations for Practice and Research**

The findings from this study found that hands-on, experiential learning had no significant difference from lecture-based classed for students in a post-secondary, introductory course. Moving forward, educators should consider a blended approach when teaching students. Lecturing is a useful teaching method when introducing students to new content that is needed for a base knowledge. Once concepts are introduced, hands-on experiences can be utilized with more complex topics to encourages students to reach higher levels on Bloom's Taxonomy (Krathwohl, 2002), as well as increase higher order thinking skills. Employing a blended approach in post-secondary classrooms can optimize experiential learning in post-secondary education. When using a blended approach, the hands-on experiences must compliment the lecture material and be a support to major concepts discussed in lectures. The experiences must also go through each phase of the experiential learning phases of learning, observation, conceptualization, and experimentation for the experience to be true and effective (Kolb, 1984). The researchers recommend that educators should amend course objectives and exam questions to correct for the change in Bloom's Taxonomy to increase the learning level that is typically achieved during hands-on experiences.

There are numerous research questions raised from this research. Future researchers should focus on how course objectives and exam questions are written for hands-on experiences. Are the exam questions and course objectives meeting the same level of Bloom's Taxonomy as the experiences? If a blended approach is selected, researchers should determine which ratio of teaching methods is most effective for hands-on experiences. Specifically, what ratio of hands-on experiences and lectures optimize knowledge comprehension and retention?

### **References**

- Baker, M. A. & Robinson, J. S. (2016). The effects of Kolb's experiential learning model on successful intelligence in secondary agriculture students. *Journal of Agricultural Education*, 57(3), 129-144. doi:10.2032/jae.2016.03129
- Baker, M. A. & Robison, J. S. (2017). The effects of an experiential approach to learning on student motivation. *Journal of Agricultural Education*, 58(3), 150-167. <https://doi.org/10.5032/jae.2017.03150>

- Barr, R. B. & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, 13-25
- Barron, D., Khosa, D., & Jones-Bitton, A. (2017). Experiential learning in primary care: Impact on veterinary students' communication confidence. *Journal of Experiential Education*, 40(4), 349-365. doi:10.1177/1053825917710038
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research on teaching*. Boston, MA: Houghton Mifflin.
- Cotton, J. M. & Sheldon, N. D. (2013). Using stable Carbon and Nitrogen isotopes of hair to teach about sustainable agriculture through active learning. *Journal of Geoscience Education*, 61(1), 59-67.
- Dewey, J. (1938). *Experience and education*. New York, NY: Touchstone
- Estep, C. M., Shelnett, K. P., & Roberts, T. G. (2014). A comparison of student and professor perceptions of teacher immediacy behaviors in large agricultural classrooms. *NACTA Journal*, 66(2), 155-162.
- Healey, M. & Jenkins, A. (2007). Kolb's experiential learning theory and its application in geography in higher education. *Journal of Geography*, 99(5), 185-195. doi:10.1080/00221340008978967
- Johnson, D. M., Wardlow, G. W., & Franklin, T. D. (1997). Hands-on activities versus worksheets in reinforcing physical science principles: Effects on student achievement and attitude. *Journal of Agricultural Education*, 38(3), 9-17. doi: 10.5032/jae.1997.03009
- Kolb, A. Y. & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning and Education*, 4(2), 193-212.
- Kolb, D. A. (1988). *Experiential learning: Experience as the source of learning and development*. Englewoods Cliffs, NJ: Prentice-Hall Inc.
- Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory into practice*, 41(4), 212 – 218. doi: 10.1207/s15430421tip4104\_2
- Mainemelis, C. Boyarzis, R. E., & Kolb, D. A. (2002). Learning styles and adaptive flexibility: Testing experiential learning theory. *Management Learning*, 33(1), 5-33.
- Osborne, E. (1993). Rediscovering our niche. *The Agricultural Education Magazine*, 66(4), 3 & 12.

- Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, 223-230.
- Rhykerd, R. L., Tudor, K. W., Wiegand, B. R., Kingman, D. M., & Morrish, D. G. (2006). Enhancing experiential learning through a hands-on crop production and marketing contest. *North American Colleges and Teachers of Agriculture*, 60(4), 25-30.
- 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., 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.
- Roehl, Am., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family and Consumer Sciences*, 105(2), 44-49.
- Shoulders, C. W. & Myers, B. E. (2013). Teachers' use of experiential learning stages in agricultural laboratories. *Journal of Agricultural Education*, 54(3), 100-115.  
doi:10.5032/jae.2013.03100
- Stor-Hunt, P. M. (1996). An analysis of frequency of hands-on experience and science achievement. *Journal of Research in Science Teaching*, 33(1), 101-109.

## Discussant Remarks

### Does Experiential Learning Improve Student Performance in an Introductory Animal Science Course?

Discussant: Ed Osborne, University of Florida

More research is needed to discover teaching approaches that generate maximum student learning. Due to the philosophical roots of the discipline, for decades researchers in agricultural education have examined the effectiveness of experiential learning in school and university classrooms and laboratories. In this study, students enrolled in an introductory collegiate animal science course were randomly assigned to two groups to test the effects of experiential learning on student achievement. The authors presented a lengthy review of previous studies that examined experiential learning (EL) approaches, along with a thorough explanation of EL theory. The authors suggested that Kolb's view is that learning cannot occur through presentation alone, yet we know that learning can occur in this way. The researchers also concluded that EL may not have a positive impact on learning. However, the findings of the study indicated that student learning in the EL group was essentially the same as learning in the control group.

The description of the study procedures omitted some important details that were needed to better understand the study and interpret the results. The authors are encouraged to carefully review the manuscript and add the missing details. Were student demographic data collected, and if so, how were they examined? How many questions comprised the exams and how were they scored? In some places the authors indicated they measured student *comprehension*, but did the exams actually measure comprehension, or were they largely recall questions? What was the nature of the EL treatment? Were *t-tests* run on individual test items, as suggested in the manuscript? In the conclusions section of the paper, the authors stated that the null hypothesis was rejected, yet the scores on the four content exams were essentially the same.

In thinking about the overall design and approach to the study, the following questions were prompted:

1. What type of assessment is most appropriate when students are taught using an experiential learning approach?
2. When designing a research study, what specific aspects of EL are most effective in (a) differentiating EL from other teaching approaches and (2) maximizing student learning?
3. To what extent can/do learning strategies embedded in EL carry over to other learning approaches, especially in a research study when the same students are exposed to both methods?
4. Does the content focus of a course dictate the optimal approaches for teaching and assessment when using experiential learning?
5. What degree of EL knowledge and skills should the teacher possess to ensure that the EL treatment in research studies is pure and consistent?

## Coauthor Network Analysis of Journal of Agricultural Education Articles from 2008-2017

Quisto Settle, Oklahoma State University  
Kathryn L. Teixeira, Oklahoma State University  
Rachel Bechtold, University of Arkansas  
Catherine W. Shoulders, University of Arkansas  
Audrey E. H. King, Oklahoma State University

### Abstract

*Collaboration is a critical part of the research process. While AAAE supports collaboration and inclusivity, analysis has not occurred for what collaborations are occurring. This study addressed collaboration between researchers via a social network analysis of coauthorship in the Journal of Agricultural Education from 2008 to 2017. There were 587 articles published in that time frame with 593 unique authors. The number of articles published annually and number of authors per article increased during the 10-year period. The majority of authors only published one article in the time frame analyzed. After excluding authors who never collaborated on an article, a social network of 582 coauthors was analyzed. There was a general tendency for the most prolific authors to also be the most connected, though there were some outliers. Of note, the majority of the most connected authors received their terminal degrees from one of three institutions. The majority of the most prolific coauthor pairs were advisor-advisee pairings, and the remainder were individuals who had worked at the same institution during much of the study's time frame. A prolific coauthor pairing was not necessarily indicative of a connection that was important for bridging authors across the network.*

### Introduction and Theoretical Framework

Collaboration has proven to be an essential skill as the complexity of new knowledge increasingly requires more interdisciplinary work; researchers share information, improve communication, and produce new data by working together on projects (De Stefano, Giordano, & Vitale, 2011). Researchers also collaborate to publish; a trend across disciplines illustrates that more coauthored pieces than sole-author works exist in scholarly journals (Victor, Hodge, Perron, Vaughn, & Salas-Wright, 2016). These coauthored pieces form and develop a structure that can be seen as a type of social capital in the publishing circuit (Bordons, Aparicio, González-Albo, & Díaz-Faes, 2015).

For a researcher to create a higher volume of published works, coauthoring aids in intellectual collaboration and individual performance (Ductor, 2015). Coauthoring with better-known scholars aids in generating more citations for other less-known researchers. As Li, Liao, and Yen (2013) stated, "to cross the boundary, it is better for a scholar to conduct research in collaboration with other scholars" (p. 1515) to facilitate a flow of shared information, resources, and workloads. Avenues for initial collaborations may be through geographic proximity; locality can play a major role in which institutions and their employees' network (Santos & Santos, 2016; Uddin, Hossain, Abbasi, & Rasmussen, 2011). As productivity is increased in these collaborative

networks as measured by the number of publications released, other benefits also emerge. Coauthors form a social network and consist of individuals who are known to at least one other individual in the group; this researcher coauthorship forms a social network which is connected through social ties (Rodway, 2015; Santos & Santos, 2016; Uddin et al., 2011).

These patterns of collaboration (e.g., the number of papers, the number of collaborators, and the temporal and spatial movement of relationships) are questions of interest because understanding coauthorship networks leads to understanding how research can be outsourced, collaborated on, and made more efficient (Santos & Santos, 2016). Not only in education but across multiple disciplines, studies have examined how collaboration turns into coauthoring and how these projects promote transdisciplinary work.

Coauthorship networks have been analyzed extensively to explore researchers' behavioral patterns (Newman, 2001), but there is still much to be learned from the structure of how the network exists; notably, the last two decades in particular, have shown an increase in interest for an analysis of these social networks (Yan & Ding, 2009). How these indicators affect authorship citations and productivity in the coauthorship network for specific journals is also of interest as different disciplines interact in unique ways (Henriksen, 2016; Li et al., 2013). There is a push to use statistical counts on coauthored works to understand how researchers collaborate; this heightened interest is possibly due to improved statistical technologies and the free access to authorship data (Uddin et al., 2011).

The *Journal of Agricultural Education (JAE)* is the premier journal for researchers of agricultural education in which many of the publications are coauthored. By publishing, scholars can earn promotion and tenure, as well as gain social interactions and find commonalities in research (Ductor, 2015). The impact of published work positively correlates with employment enhancement. In other words, the more research and publications a scholar undertakes, the greater the chance of promotions, tenure, and enhancement of a researcher's reputation; project motivation and increased grant funding may be an added benefit (Abbasi, Altmann, & Hossain, 2011; Li et al., 2013; Yan & Ding, 2009).

Past work has assessed author productivity in *JAE*. Radhakrishna and Jackson (1995) assessed the most prolific authors of the 1980s. During that time period, there were 309 articles published overall, with almost half the articles featuring one of the most prolific authors. The most prolific author had 16 articles. They also assessed the terminal degree of prolific authors whom they were able to contact via telephone, finding six were graduates of Ohio State University, three from Texas A&M University, and two from Iowa State University. No other university was represented more than once among the most prolific authors. Of note are the factors the authors believed helped them be successful: After personal drive being listed by everyone, the majority also listed colleagues, graduate school training, advisors, and employers, which indicates the value of social capital for productivity.

Kelly and Warmbrod (1986) also assessed productivity within agricultural education, though their study was broader than journal publications. Their participants reported there were

three categories aiding productivity: content enablers, context enablers, and collaborative factors. Among other aspects, content enablers included experience with research courses and projects, context enablers included work with other researchers and graduate students, and collaborative factors included “help from advisers or researchers” (p. 30). All of three categories have components grounded in the building and sharing of social capital. The majority of participants reported having a competent advisor was the most important factor affecting their productivity and that advising graduate students also aided their productivity.

While research activity is important, there is disparity across the discipline in terms of research capacity (Greiman & Birkenholz, 2003). Collaboration could offer the opportunity to help narrow this disparity while also aiding scholarly output in the discipline (Myers & Osborne, 2006). Past research has addressed research productivity in *JAE* and agricultural education, but the past work did not assess collaboration. Radhakrishna and Jackson (1995) excluded coauthorship between prolific authors in their analysis, only giving credit to whoever was listed first, even though the majority of articles in this time frame were coauthored.

While research on collaboration across the discipline is lacking, Hajdik, Huddleston, Phelan, Zander, and Dooley (2003) did assess collaboration within the graduate program of an agricultural education department. One of the issues they found was a lack of common ground between the faculty members’ research agendas and students’ research interests. The faculty members believed it was the onus of students to initiate research collaborations with faculty members. The researchers made recommendations to improve communication with and mentoring of graduate students in the program.

This paper explores the existing network of coauthorship by examining papers published in *JAE* over a 10-year period from 2008 to 2017. Because many authors publish more than one journal, data on publications found in one journal will not give a complete picture of authorship patterns (Santos & Santos, 2016; Newman, 2004). However, this study was specifically undertaken to describe author collaboration and coauthorship patterns within *JAE*, which is the only national journal of the American Association for Agricultural Education (AAAE).

Social capital provided the framework for this study. Social capital consists of the social structure that allows individuals and organizations to share resources and knowledge (Yang, Keller, & Zhang, 2017). Like any resource, social capital benefits those who have it (Kriesi, 2007), but unlike other resources, social capital is inherently a shared resource that benefits both parties involved (Coleman, 1990). While gaining social capital is not typically the goal of collaborations such as those done in research (Hauberer, 2011), social capital is still gained in the process and becomes the property of both parties involved (Burt, 1992).

While the type of analysis in this study cannot assess the quality of interactions (Scott, 2017; White, 2011), there is still a need to provide a baseline understanding of what interactions are occurring in the agricultural education. As the discipline seeks to promote collaboration and inclusivity (Roberts, Harder, & Brashears, 2016), there is a need to understand what

collaborations are occurring. Without this baseline information, it will be difficult for the discipline to move forward in fostering more and better collaborations.

### **Purpose and Objectives**

Exploring data behind interactions found in social structures as a measure of social capital can have a strong research impact. By collaborating to share resources and expertise, the discipline as a whole can help promote efficient and effective agricultural education programs (Roberts et al., 2016), but understanding how social capital can be fostered is difficult without understanding what collaborations are already occurring. Social network analysis is needed to provide these baseline data.

The purpose of this study was to evaluate how coauthorship can be seen as a form of social capital in the agricultural education fields for researchers who publish. The objectives of the paper were to 1) describe the authorship, category, and frequency of *JAE* published papers and 2) describe the coauthor network found in *JAE* papers from 2008-2017. In doing so, it is possible to compare coauthor networks and determine what structure has evolved over the last 10 years as researchers have collaborated and published together.

### **Methods**

This study consisted of a social network analysis of coauthorship in *JAE*. Social network analysis explores the patterns of relationships between individuals and how groups form from these relationships (Scott, 2017). Analysis can include both numerical descriptions of the properties of social networks and visualizations of the relationships (Scott, 2017). While the network is developed through a quantitative analysis, an element of qualitative analysis is required to describe the network and its development (Scott, 2017).

*JAE* was selected as the target publication because it is the academic journal for AAAE, which seeks “to be the premier national society for social science scholarship in food, agriculture and natural resources” (AAAE, n.d.). *JAE* offers the best opportunity to understand coauthorship within the broadly defined world of agricultural education. Inclusion of related journals that agricultural education researchers publish in would increase the breadth of data that could be included but would also include researchers outside of the agricultural education community, which would potentially obscure relationships within the agricultural education community. AAAE conferences were excluded from analysis because many of those works become journal articles. For social network analysis that uses relational data like this study, analysis can quickly become unwieldy, so it is necessary for researchers to establish boundaries for what will and will not be included in analysis (Scott, 2017).

All articles published online in *JAE* were analyzed for authorship from 2008 to 2017. For objective 1, all 587 articles are analyzed. For objective 2, articles with one author are excluded because they do not contribute to the coauthorship network ( $N = 555$ ). Volume, issue, and authors were logged for each article in Excel. For the social network analysis, each unique author

pair was logged. A two-author publication would have one unique interaction, a three author-publication would have three unique interactions, and so on. Names were cross-checked using a researcher-developed master list, and all spelling and surname discrepancies were addressed before placing the names into the final listing of authorship pairs.

For objective 1, analysis included frequency of articles and their authors, including analysis of first authorship. Means were calculated for authors per article, including splitting results by volume. For objective 2, social network analysis can look at the full network and individuals' results within the network, which includes nodes (i.e., individual authors) and interactions between authors. For the full network, analysis included assessing the number of nodes, components (i.e., sets of nodes connected to each other but the rest of the network), diameter (i.e., longest of all shortest paths between nodes), number and average of shortest paths calculated, average number of neighbors (i.e., neighboring nodes per node), network centralization, and network density. Reporting characteristics of nodes includes degree (i.e., connections to other authors), average shortest path between the node and other nodes, betweenness centrality (i.e., extent a node connects other nodes to each other that would otherwise be unconnected), clustering coefficient (i.e., tendency for a node's neighbors to be connected to each other), and eccentricity (i.e., furthest any other node in the network is from the node). Interactions between coauthor pairings are reported by number of interactions and edge betweenness (i.e., number of shortest paths that go through that connection). Cytoscape was used to conduct the social network analysis.

## Results

### Objective 1: Describe the Authorship, Category, and Frequency of *JAE* Published Papers

From volumes 49 to 58, there were 587 articles published, with a total of 1509 nonunique authors and 2148 coauthorship pairs. There were 593 unique authors and 1533 unique pairings of coauthors. More than half of authors had one article (Table 1). Ten authors had 20 or more articles in the 10-year period assessed. There were 300 unique first authors, with 183 (27.67%) who were first author on one publication. Twenty individuals were first author on six or more publications, with the highest being 12.

Table 1

#### *Publication Frequency of Authors*

Number of Articles	Author Frequency	Number of Articles	Author Frequency
1	337	15	1
2	88	16	2
3	46	17	3
4	23	18	1
5	16	20	1
6	16	22	2
7	15	23	1

8	13	25	2
9	6	28	1
10	5	33	1
11	3	38	1
12	2	44	1
13	6		

There were 58.7 articles published per volume, with a low of 43 for volume 50 and a high of 80 for volume 58 (Table 2). The mean for authors per article was 3.00, with a trend of increasing authorship during the time frame of the study. The majority of publications ( $n = 555$ , 94.55%) were coauthored (Table 3). Solo authorship accounted for less than 6% ( $n = 32$ , 5.45%) of all articles published, including 10 that were in the distinguished lecture series. The most common number of authors per article was two ( $n = 207$ ; 35.26%). There were 24 (4.09%) journal articles with more than five authors, including one publication with nine authors.

Table 2

*Articles and Coauthorship by Volume*

Volume	Number of Articles	Authors per article
49	45	2.53
50	43	2.79
51	49	2.78
52	59	2.83
53	53	3.17
54	67	2.96
55	71	3.30
56	60	3.08
57	60	3.12
58	80	3.18
Total	587	3.00

Table 3

*Frequency of Articles by Number of Authors*

Number of authors	Frequency of articles	%
1	32	5.45
2	207	35.26
3	183	31.18
4	90	15.33
5	51	8.69
6	17	2.90
7	6	1.02
9	1	0.17

**Objective 2: Describe the Coauthor Network Found in *JAE* Papers**

While there were 593 unique authors, 11 of the authors were only on solo-authored publications, so they were not included in the social network analysis because they did not contribute to the coauthorship network. This led to 582 nodes in the network located across 26 components. The average number of neighbors per node was 5.27. There were 243,843 shortest paths between nodes calculated in the network, with an average shortest path length of 4.20. The diameter of the network was 9. The clustering coefficient for the network was .68. The network centralization score was .09. The network density was .01.

Table 5 shows the characteristics of the most-connected nodes in the network. The most connected node was T. Grady Roberts ( $f = 55$ ), followed by Alexa J. Lamm ( $f = 44$ ), Christopher Stripling ( $f = 35$ ), J. Shane Robinson ( $f = 32$ ), and Theresa Pesl Murphrey ( $f = 32$ ). All of the most-connected nodes are connected to at least one of the other most-connected nodes. Roberts is connected to 12 of the other 24 nodes, while A. Lamm is connected to 11 of the other 24 nodes. Robinson and Anna L. Ball had the lowest eccentricity (i.e., furthest distance to any node they can connect to) at 5 of the most-connected authors, while the other most-connected authors were 6 or 7 degrees removed from the node that was furthest away. Roberts had the lowest average shortest path ( $M = 2.68$ ) and highest betweenness centrality (.20) among the most-connected authors. Murphrey, Roberts, and Stacy K. Vincent (.11) had the lowest clustering coefficient scores among the most-connected authors, indicating the nodes they are connected to are not that well connected to each other. Of note are the institutions that granted the terminal degrees of the most-connected nodes. Three institutions were responsible for 20 of the nodes: University of Florida ( $f = 9$ ), University of Missouri ( $f = 6$ ), and Texas A&M University ( $f = 5$ ).

Table 6 shows interactions and edge betweenness for the most prolific coauthor pairs. The pairs with the most interactions were Aaron J. McKim-Jonathan J. Velez ( $f = 14$ ), Stripling-Roberts ( $f = 11$ ), McKim-Tyson J. Sorenson ( $f = 10$ ), Robinson-M. Craig Edwards ( $f = 10$ ), A. Lamm-Kevan W. Lamm ( $f = 10$ ), and Ryan G. Anderson-Thomas H. Paulsen ( $f = 10$ ). Of the 20 most-prolific coauthor pairings, 12 of them are advisor-advisee connections. The highest edge betweenness scores were for Robinson-Edwards (4009.29) and Amy M. Harder-Roberts (3959.68).

Table 5

*Characteristics of the 25 Most-Connected Nodes within Network*

Author	Degree	# of Publications	Average Shortest Path	Betweenness Centrality	Clustering Coefficient	Eccentricity
T. Grady Roberts	55	44	2.68	.20	.11	6
Alexa J. Lamm	44	38	2.94	.13	.12	6
Christopher T. Stripling	35	25	3.09	.07	.15	7
J. Shane Robinson	32	28	2.99	.12	.12	5
Theresa Pesi Murphrey	32	16	3.12	.08	.11	7
Amy M. Harder	28	18	3.19	.06	.12	7
Carrie Ann Stephens	27	15	3.21	.06	.12	7
Jonathan J. Velez	26	25	3.28	.07	.17	6
Tracy A. Rutherford	25	8	3.01	.06	.16	6
Scott Burris	24	13	3.50	.05	.15	7
M. Craig Edwards	23	22	3.31	.07	.13	6
Anna L. Ball	23	17	2.87	.13	.15	5
John Rayfield	22	17	3.29	.05	.13	6
John Ricketts	20	8	3.13	.05	.23	6
Brian E. Myers	20	33	3.10	.05	.21	7
Catherine W. Shoulders	20	17	3.15	.05	.17	7
J. C. Bunch	20	10	3.17	.07	.21	6
Tracy A. Irani	20	8	3.13	.03	.31	6
Ryan G. Anderson	19	13	4.12	.06	.16	7
Laura A. Warner	19	11	3.51	.02	.21	7
Nicole L. P. Stedman	19	7	3.19	.01	.28	7
Andrew C. Thoron	19	22	3.29	.03	.18	7
Tracy J. Kitchel	18	23	3.33	.04	.20	6
Jonathan D. Ulmer	18	7	3.32	.03	.21	6
Stacy K. Vincent	18	11	3.43	.09	.11	6

Table 6

*Interactions and Edge Betweenness for the 20 Most Prolific Coauthor Pairs*

Author Pair	Interactions	Edge Betweenness
Aaron J. McKim-Jonathan J. Velez	14	102.57
Christopher T. Stripling-T. Grady Roberts	11	2163.34
J. Shane Robinson-M. Craig Edwards	10	4009.29
Ryan G. Anderson-Thomas H. Paulsen	10	1967.24
Alexa J. Lamm-Kevan W. Lamm	10	675.10
Aaron J. McKim-Tyson J. Sorensen	10	629.58
Carrie Ann Stephens-Christopher T. Stripling	9	1327.91
Jonathan J. Velez-Tyson J. Sorensen	8	1451.04
Brian E. Myers-Catherine W. Shoulders	8	1090.96
Alexa J. Lamm-Joy N. Rumble	8	697.01
Andrew C. Thoron-Brian E. Myers	8	624.49
Amy M. Harder-T. Grady Roberts	7	3959.68
J. Joey Blackburn-J. Shane Robinson	7	720.93
Alexa J. Lamm-Laura A. Warner	6	1351.29
Amber H. Rice-Tracy J. Kitchel	6	986.00
Nathan W. Conner-T. Grady Roberts	6	693.24
J. Shane Robinson-Marshall A. Baker	6	514.27
Andrew C. Thoron-Eric D. Rubenstein	6	411.22
Michael J. Martin-Tracy J. Kitchel	6	155.82
Hannah S. Carter-Kevan W. Lamm	6	23.58

### Conclusions

The results of objective 1 showed the majority of *JAE* authors only published once in the 10-year span addressed in this study, and three-fourths of all authors published three or fewer articles. On the other hand, out of 593 authors, 25 authors had at least 12 publications and 10 had at least 20 publications. While there is a larger number of prolific authors in this study than there were in the 1980s (Radhakrishna & Jackson, 1995), much of *JAE*'s content is still being produced by a relatively small portion of its author population. As for reasons a majority of authors only published once, possibilities include graduate students publishing once off of a thesis or external committee members on theses who are not in the agricultural education, but it is not possible to understand why so many authors are not more engaged in *JAE* without further exploration.

As a journal, *JAE* is publishing more articles each year, indicating increased scholarly activity in agricultural education. The 10-year period in this study resulted in almost twice as many research articles as occurred in the 1980s (Radhakrishna & Jackson, 1995). In addition to increased articles, there are also more authors per article as the 10-year period unfolded in this

study. While the mode number of authors was two, the majority of articles had three or more authors.

Objective 2 explored the social network of coauthorship in *JAE*. The overall analysis indicated a decentralized network with low connectivity, though an academic network is informally developed, which is a possible reason those results occurred. The most-connected authors also tended to be among the most prolific. Though there were some exceptions, this is worth noting because of past recommendations that promoted increasing and improving collaboration to increase productivity (Hajdik et al., 2003; Kelly & Warmbrod, 1986; Myers & Osborne, 2006; Radhakrishna & Jackson, 1995).

In looking at characteristics of the most-connected authors, it is noteworthy that 20 of the 25 had doctoral degrees from three universities: University of Florida, University of Missouri, and Texas A&M University, which were also three of the four most distinguished programs recognized in the Birkenholz and Simonsen study (2011). This is a shift from the 1980s when Ohio State University, Texas A&M University, and Iowa State University were the most represented terminal degree institutions by prolific authors (Radhakrishna & Jackson, 1995). The common academic background could help explain why the most-connected authors in the network also tend to be connected to each other. Another characteristic to note is that the majority of the most-connected authors were faculty members the entire time period addressed, which would give them the ability to supervise graduate students.

For the most prolific author pairings, more than half included an author who was not among the most connected, despite relatively high research activity. Another trend to note is that more than half of the most prolific author pairings were between advisors and their advisees, which is in line with past research about graduate student advising aiding productivity (Kelly & Warmbrod, 1986). The advisor/advisee pairings were responsible for three-fourths of the pairs that included at least one individual who was not among the most-connected authors. Conversely, the edge betweenness results indicated that the Robinson-Edwards and Roberts-Harder author pairs – both of which faculty partners at the same respective institutions – were more important for linking authors across the entire network. While advisor/advisee pairings were the majority of the most productive pairings, that productivity did not necessarily translate to improving the connections within the overall *JAE* network.

## **Recommendations**

### **Recommendations for Research**

While this research shed light on the author collaborations occurring in *JAE*, this study was descriptive and meant to provide baseline data about the academic community. Future research is needed to better understand these interactions, including how they possibly impact productivity via shared capital.

First, analysis is needed to assess the relationship various factors have with connectivity in *JAE*. For example, while the majority of the most-connected authors were graduates of three universities, it may be coincidental. Past research has assessed factors affecting productivity (Kelly & Warmbrod, 1986; Radhakrishna & Jackson, 1995), but understanding how similar factors affect connectivity can provide a fuller view of *JAE* from a social capital perspective.

Second, this study assessed which relationships existed, not how effective the relationships were. Why authors chose to collaborate and the effectiveness of those working relationships needs to be further addressed with the aim of improving collaborations across the discipline. Qualitative research could help address this question. In particular, it needs understand how to foster different types of relationships. This includes understanding how advisors can work more effectively with their advisees, how faculty can more effectively partner within their respective departments, and how faculty can more effectively collaborate between institutions when no previous direct ties exist.

The third recommendation is to evaluate the citation social network in agricultural education. Past research has addressed use of citations in *JAE* (Estes, Zimmerman, Shoulders, & Johnson, 2014; Radhakrishna, Eaton, Conroy, & Jackson, 1994), but the discipline would benefit from analysis of which works are being cited and by whom. The coauthorship network describes who is collaborating, but citation networks can indicate which works are most influential and which works are being cited together in the same articles (Yang et al., 2017).

Fourth, this study assessed productivity and connectivity within *JAE*, not the quality of the work. Assessing the quality of articles being published require different approaches. An example is the Warmbrod (2014) publication addressing the use and interpretation of Likert-type scales in *JAE*. Assessing *JAE*'s publications from a variety of angles is needed to fully understand AAAE's premier journal. This periodic assessment can help inform the decisions AAAE and its members make in trying to improve scholarly activity and impact. Addressing potential research quality issues discipline-wide is unlikely to occur if those issues are not first identified empirically, as opposed to anecdotally.

The last research recommendation is to repeat this study in 10 years. This paper provided an assessment of the past 10 years, but the only constant is change. The discipline of agricultural education is constantly changing and adapting, which necessitates reassessing the network of coauthorship in the discipline, among other research assessing the discipline.

### **Recommendations for Practice**

The first recommendation is to increase engagement from a wider variety of individuals and universities. The most prolific authors were graduates of three universities, which decreases the likelihood of alternative perspectives of research problems in the discipline. That said, the most prolific authors' current institutions were more widespread, which might lead to wider engagement in the future. AAAE should explore opportunities to widen participation in scholarly output.

The second recommendation is to increase interuniversity collaboration between authors without pre-existing connections. AAAE includes three regional meetings and one national meeting each year, yet the most prolific author pairings happened within universities or between advisors and their advisees. While this is logical from a convenience standpoint, research and subject matter expertise can easily travel beyond institutional boundaries. This is particularly important for faculty at smaller institutions who may lack peer agricultural education faculty or robust graduate programs to recruit graduate advisees. Connecting with faculty at other institutions could offer the opportunity to use and expand social capital in the discipline.

The last pair of recommendations relate to improving productivity and connectivity in the discipline. For authors trying to increase productivity, graduate advising appears to be aid productivity (Kelly & Warmbrod, 1986; Radhakrishna & Jackson, 1995). For authors trying to improve their connectivity in the discipline, interuniversity connections appear to be helpful. From the standpoint of improving individual success while also contributing to the social capital of the discipline, both are necessary. A productive pair of authors who are not well connected are likely to limit their potential impact in the discipline, while an individual who is well connected without being adequately productive could risk failing to achieve tenure and promotion. Agricultural education needs to find the right balance to ensure that individual success translates to discipline-wide success.

### References

- Abbasi, A., Altmann, J., & Hossain, L. (2011). Identifying the effects of co-authorship networks on the performance of scholars: A correlation and regression analysis of performance measures and social network analysis measures. *Journal of Informetrics*, 5(4), 594-607.
- Abbasi, A., Chung, K. S. K., & Hossain, L. (2012). Egocentric analysis of co-authorship network structure, position and performance. *Information Processing & Management*, 48(4), 671-679.
- American Association for Agricultural Education (n.d.). *Mission*. Retrieved from <http://aaaeonline.org/Mission>
- Birkenholz, R. J., & Simonsen, J. C. (2011). Characteristics of distinguished program of agricultural education. *Journal of Agricultural Education*, 52(3), 16-26. doi:10.5032/jae.2011.03016
- Bordons, M., Aparicio, J., González-Albo, B., & Díaz-Faes, A. A. (2015). The relationship between the research performance of scientists and their position in co-authorship networks in three fields. *Journal of Informetrics*, 9(1), 135-144.
- Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Coleman, J. S. (1990). *Foundations of social theory*: Cambridge, MA: Belknap Press.

- De Stefano, D., Giordano, G., & Vitale, M. P. (2011). Issues in the analysis of co-authorship networks. *Quality & Quantity*, 45(5), 1091-1107.
- Ductor, L. (2015). Does co-authorship lead to higher academic productivity? *Oxford Bulletin of Economics and Statistics*, 77(3), 385-407.
- Estes, H. E., Zimmerman, B. W., Shoulders, C. W., & Johnson, D. M. (2014). Use of citations within manuscripts published by the *Journal of Agricultural Education*. *Journal of Agricultural Education*, 55(5), 78-92. doi:10.5032/jae.2014.05078
- García-Sánchez, P., Díaz-Díaz, N. L., & De Saá-Pérez, P. (2017). Social capital and knowledge sharing in academic research teams. *International Review of Administrative Sciences*. Advance online publication. doi: 10.1177/0020852316689140
- Greiman, B. C., & Birkenholz, R. J. (2003). Agricultural education research capacity in NCA-24 institutions. *Journal of Agricultural Education*, 44(3), 66-77. doi:10.5032/jae.2003.03066
- Hajdik, S., Huddleston, M., Phelan, K. C., Zander, K., & Dooley, K. E. (2003). *What's really going on: Collaboration of research efforts in a department of agricultural education*. Paper presented at the Annual Western Region Agricultural Education Research Conference, Troutdale, OR.
- Hauberer, J. (2011). *Social capital theory: Towards a methodological foundation*. Germany: VS Verlag für Sozialwissenschaften.
- Henriksen, D. (2016). The rise in co-authorship in the social sciences (1980–2013). *Scientometrics*, 107(2), 455-476.
- Kelly, M. E., & Warmbrod, J. R. (1986). Developing and maintaining productive researchers in agricultural education. *Journal of the American Association of Teacher Educators in Agriculture*, 27(1), 27-32. doi:10.5032/jaatea.1986.01027
- Kriesi, H. (2007). Organizational resources: Personnel and finances. In W. A. Maloney, & S. Rossteutscher *Social Capital and association in European democracies: A comparative analysis* (pp. 35-50). New York, NY: Routledge.
- Li, E. Y., Liao, C. H., & Yen, H. R. (2013). Co-authorship networks and research impact: A social capital perspective. *Research Policy*, 42(9), 1515-1530.
- Myers, B. E., & Osborne, E. W. (2006, May). *Research capacity in agricultural education*. Paper presented at the 33rd Annual National Agricultural Education Research Conference, Charlotte, NC.

- Newman, M. E. J. (2001). Scientific collaboration networks. II. Shortest paths, weighted networks, and centrality. *Physical Review E*, 64(1), 0161321-7. doi: 10.1103/PhysRevE.64.016132
- Radhakrishna, R. B., Eaton, D., Conroy, C., & Jackson, G. (1994). An empirical analysis of the literature cited in the *Journal of Agricultural Education*. *Journal of Agricultural Education*, 35(1), 61-65. doi:10.5032/jae.1994.01061
- Radhakrishna, R. B., & Jackson, G. B. (1995). Prolific authors in the *Journal of Agricultural Education*: A review of the eighties. *Journal of Agricultural Education*, 36(1), 55-63. doi:10.5032/jae.1995.01055
- Roberts, T. G., Harder, A., & Brashears, M. T. (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.
- Rodway, J. (2015). Connecting the dots: Understanding the flow of research knowledge within a research brokering network. *Education Policy Analysis Archives*, 23, 123.
- Santos, J. A. C., & Santos, M. C. (2016). Co-authorship networks: Collaborative research structures at the journal level. *Tourism & Management Studies*, 12(1), 5-13.
- Scott, J. (2017). *Social network analysis* (4th ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- Uddin, S., Hossain, L., Abbasi, A., & Rasmussen, K. (2011). Trend and efficiency analysis of co-authorship network. *Scientometrics*, 90(2), 687-699.
- Victor, B. G., Hodge, D. R., Perron, B. E., Vaughn, M. G., & Salas-Wright, C. P. (2016). The rise of co-authorship in social work scholarship: a longitudinal study of collaboration and article quality, 1989–2013. *British Journal of Social Work*, 47(8), 2201-2216.
- Warmbrod, J. R. (2014). Reporting and interpreting scores derived from Likert-type scales. *Journal of Agricultural Education*, 55(5), 30-47. doi:10.5032/jae.2014.05030
- White, H. (2011). Scientific and Scholarly networks. In J. Scott & P. J. Carrington (Eds.), *The SAGE handbook of social network analysis* (pp. 271-286). London, England: Sage Ltd.
- Yan, E., & Ding, Y. (2009). Applying centrality measures to impact analysis: A coauthorship network analysis. *Journal of the American Society for Information Science and Technology*, 60(10), 2107-2118.
- Yang, S., Keller, F. B., & Zheng, L. (2017). *Social network analysis: Methods and examples*. Thousand Oaks, CA: SAGE Publications, Inc.

## Discussant Remarks

### Coauthor Network Analysis of Journal of Agricultural Education Articles from 2008-2017

Discussant: Ed Osborne, University of Florida

Research collaboration has become the norm, and single-author journal publications have become a rarity. The advantages of researcher collaboration in research, grants, and other areas of faculty responsibility have been widely discussed. This study sought to examine the connectedness those who co-authored articles in the *Journal of Agricultural Education* over a recent 10-year period. Social network analysis (SNA) revealed that the most prolific authors in this journal were also the most connected, and those most connected were predominantly from one of three institutions. The study also found that prolific author pairings were not necessarily the most connected across the broader network of authors. This was a timely and fascinating research project, and the manuscript provided a thorough and sound rationale and background context for the work. Social network theory was appropriately cited as the theory base for the investigation. The manuscript was well-written with a clear presentation of ideas and procedures throughout. I especially appreciated the paragraph that provided a succinct definition of each term used in SNA, although I believe the definition of “components” in the network was inadvertently misstated. Overall, this was an excellent, informative application of social network analysis.

The study prompted some interesting questions worth further thought:

1. Nearly all articles published in *JAE* over this recent 10-year period were co-authored. What are the implications of this clear norm in our graduate student and young faculty mentoring and development programs? The findings on connectedness also have significant implications for these groups.
2. Only 14% (83) of the 593 unique authors published more than five articles in *JAE* during this 10-year period. If, in fact, *JAE* is the premier journal for our discipline, would we expect this percentage to be higher, especially given the significant expectations for refereed publications at most institutions today?
3. The authors concluded that “much of *JAE*’s content is still being produced by a relatively small portion of its author population.” What is the underlying story behind this pattern, and should the profession be concerned about this pattern of publication?
4. Overall, the results showed low connectivity in the network. Assuming that greater connectivity is desired, how can this be achieved?
5. How can we increase research collaboration across institutions and beyond advisor-advisee pairs and author teams in the same institution?

This was a fascinating study that will stimulate lots of questions and ideas for the reader. In particular, the thoughtful and intriguing commentary in the Conclusions and Recommendations sections deserves our focused attention as individual researchers and as a collective research community.

## Why do Growers Adopt Water Conservation Practices? Viewing Extension Opportunities through a New Lens

Laura A. Warner, University of Florida  
Alexa J. Lamm, University of Georgia  
Sarah A. White, Clemson University  
Paul R. Fisher, University of Florida  
Peyton N. Beattie, University of Georgia

**Acknowledgement:** This material is based upon work that was supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2014-51181- 22372.

### Abstract

*Extension professionals help important agricultural sectors across the country resolve challenges using science-based practices that enhance environmental and social wellbeing while supporting businesses. Nursery and greenhouse growers comprise one of the largest sectors of U.S. agriculture, and this group is challenged to conserve water without compromising their economic viability. While Extension professionals educate and support nursery and greenhouse growers, there is a deficiency of research on adoption processes within this sector. To better understand this important Extension audience, this research examined the influence of critical thinking style, problem-solving style, and perceived characteristics of water conservation technologies on their implementation. A route to adoption was established to inform effective Extension activities that promote water conservation. Problem-solving style predicts trialability while critical thinking style predicts none of the five characteristics of innovations. Four of the five characteristics of water conservation innovations play a role in nursery and greenhouse growers' implementation, and implementation does influence adoption. When designing water conservation programs for nursery and greenhouse growers, Extension professionals should consider participants' problem-solving style and incorporate strategies to increase trialability, relative advantage, and observability while decreasing complexity.*

### Introduction

Extension professionals are a key source of knowledge and support for nursery and greenhouse growers (Fulcher et al., 2012). Horticulture, the agricultural sector to which landscape and nursery growers belong, is a growth area in United States agriculture (Hall, Hodges, & Haydu, 2006). The U.S. nursery and greenhouse industry contributes nearly \$14 billion in annual sales to the economy (U.S. Department of Agriculture, 2016), exceeding the value of some other important agricultural crops (Fulcher et al., 2012). Along with floriculture production, the nursery and greenhouse sector employ over 200 thousand people in the United States (Hodges, Hall, Palma, & Khachatryan, 2015).

The nursery and greenhouse industry produces most of the nation's ornamental plants, growing more than 2,000 ornamental plant species (Lea-Cox et al. 2010). Greenhouses are enclosed and covered environments where growth conditions such as light, humidity, and irrigation can be controlled (Majsztzik et al., 2017). Nurseries are typically open-air operations and plants may be grown in the ground or in containers (Majsztzik et al., 2017). While providing the vegetation society demands, nursery and greenhouse growers are "typically intense users of resources that are applied to relatively small land areas" (Lea-Cox et al., 2010, p. 509). The nursery and greenhouse industry uses large volumes of water to irrigate more than 660,000 acres across the United States (United States Department of Agriculture, 2013). Water availability is a critical topic among industry members and the Extension and research professionals who serve them (Fulcher, LeBude, Owen, Jr., White, & Beeson, 2016). Water availability to growers may decline in the future (Fulcher & Fernandez, n.d.a). Every day, greenhouse and nursery growers make decisions that influence their effective use of irrigation water (Fulcher & Fernandez, n.d.b). A number of barriers can challenge and reduce irrigation efficiency at an operation. For example, the limited substrate (i.e., growth medium) volume held within containers mandates frequent and sometimes excessive irrigation during plant production (Chappell et al., 2013). In addition, salinity of irrigation water may necessitate higher leaching rates to maintain salt levels at or below plant tolerance levels.

More than two billion dollars were invested in improving existing and installing new irrigation systems between 2003 and 2008 among agricultural producers (Schaible & Aillery, 2012) yet there is still more that can be done. Growers can use more precise irrigation technologies, such as smart irrigation controls or drip irrigation, to supply water in smaller amounts throughout the day or treat and reuse water onsite (Yeager et al., 2010). Growers have access to water conservation technologies such as wireless sensor networks that can be used to guide irrigation decision-making and automatically control irrigation valves, thereby allowing application of precise amounts of water exactly when and where it is needed (Chappell, Dove, van Iersel, Thomas, & Ruter, 2013; Majsztzik, Lichtenberg, & Saavoss, 2013). Other conservation strategies include modifying plant spacing, grouping plants with similar water needs, modifying growth medium composition, irrigation scheduling, and using alternative water sources (Fulcher & Fernandez, n.d.a).

As the nursery and greenhouse industry strives to increase production efficiencies while maintaining livelihoods, adoption of water conservation technologies and practices may be hindered if growers perceive inadequate research has been conducted in both controlled and applied settings (Chappell et al., 2013). Majsztzik et al. (2013) suggested as water becomes more scarce, growers would be more willing to recognize the benefits of water conservation technologies. However, tens of thousands of irrigated agricultural operations report they are not making improvements to reduce their water or energy use because of uncertainty about future water availability (United States Department of Agriculture, 2013). Unchanged regulations and existing infrastructure also serve as barriers to the adoption of conservation practices (Fulcher et al., 2016).

Using qualitative methods, researchers have recently reported U.S. nursery and greenhouse growers had positive attitudes toward water conservation. However, growers considered some technologies to be either incompatible with the operation, or too expensive or complicated to use (Lamm, Warner, Martin, White, & Fisher, 2017; Lamm, Warner, Taylor, Martin, White, & Fisher, 2017). Caplan, Tilt, Hoheisel, and Baugher (2014) also applied characteristics of innovations in their qualitative study on grower use of harvesting and pest management technologies, and reported that cost and equipment complexity were barriers to adoption. While costs have emerged as an important factor in adoption we wanted to look beyond financial aspects to other external influences.

Both Lamm, Warner, Martin, et al. (2017) and Lamm, Warner, Taylor, et al. (2017) recommended quantitative analyses be conducted to further explore adoption processes among nursery and greenhouse growers. Caplan et al. (2014) suggested research was needed to further explore the role Extension professionals can play to support the adoption process of nursery and greenhouse growers. Research on effectively engaging nursery and greenhouse growers is very limited. Little is known about how to best support this industry while encouraging the use of water conservation technologies in nurseries and greenhouses. To address this need, we conducted a quantitative study of U.S. nursery and greenhouse growers, and examined how perceived characteristics of innovations, critical thinking style, and problem solving style influence adoption of water conservation technologies among nursery and greenhouse growers.

### **Theoretical Framework**

Rogers' Diffusion of Innovations outlines the adoption process and explains the influence of five characteristics of innovations: relative advantage, compatibility, complexity, observability, and trialability (Rogers, 2003). Relative advantage is the extent to which something is better than what is currently being used. Compatibility is how an innovation fits with existing processes and values. Complexity refers to how easy or difficult something is to use. Observability is the opportunity to see others using the innovation, and trialability is the opportunity to test an innovation. In the context of the current study, water conservation strategies would be more likely to be adopted among nursery and greenhouse growers if they are perceived as being better than what is currently used, compatible with the operation, easy to use, and available to observe and trial. From their qualitative study of farmers in Indiana, Reimer, Weinkauff, and Propoky (2012) reported strong perceived relative advantage, observability, and compatibility were most important to understanding adoption of agricultural best management practices such as the use of cover crops. In their qualitative study, Lamm, Warner, Taylor, et al. (2017) applied Rogers' (2003) characteristics of innovations and found complexity and compatibility were major factors influencing U.S. grower adoption of water treatment technologies such as chlorination.

While the characteristics of water conservation technologies may influence their adoption, growers' cognitive characteristics, such as critical thinking style and problem-solving style, should also be considered. Perry, Retallick, and Paulsen (2014) discussed the wide range of definitions for critical thinking. Paul (1995) defined critical thinking as purposeful thought integrated with intellectual principles. Lamm and Irani (2011) described critical thinking style as

the “way critical thinking is expressed, or performed, or done by an individual” (p. 6). Critical thinking style falls somewhere on a continuum between a preference for seeking out information and engaging with the problem (Lamm & Irani, 2011). Critical thinking style can be measured using the University of Florida Critical Thinking Inventory (UFCTI; Lamm & Irani, 2011). Gorham, Lamm, and Rumble (2014) recommended delivering information to engagers through channels such as opinion leaders and developing quality sources for seekers to personally access information.

Kirton (2011) explained that each individual’s problem-solving style falls somewhere on a continuum between adaption and innovation. People who prefer an adaptive problem-solving style like greater levels of structure, while those who prefer an innovative problem-solving approach like fewer boundaries. Those who are more adaptive tend to want to improve on previous solutions while those who are more innovative tend to want to find new solutions (Lamm, Shoulders, Roberts, Irani, Unruh Snyder, & Brendemuhl, 2012). Problem-solving style can be measured using the Kirton Adaption-Innovation Inventory (KAI). A literature review revealed no previous use of the KAI to understand the problem-solving styles of nursery and greenhouse growers, although it has been applied to other agricultural education contexts. Blackburn, Robinson, and Kacal (2015) conducted a small exploratory study and found no relationship between problem-solving style and learning among preservice agriculture teachers. Blackburn and Robinson (2017) found the more innovative students in a school-based agriculture program were less likely to be successful in troubleshooting small engines. Lamm et al. (2012) created an innovator group, an adapter group, and a mixed group among study abroad students and assigned each group a problem-solving project. They found each group solved the problem differently, and concluded agricultural educators need to integrate an understanding of how people problem solve into their programming.

For this study, we considered how problem-solving style and critical thinking style could influence growers’ perceptions of the characteristics of water conservation innovations and how those perceptions then influenced implementation and adoption (Figure 1).

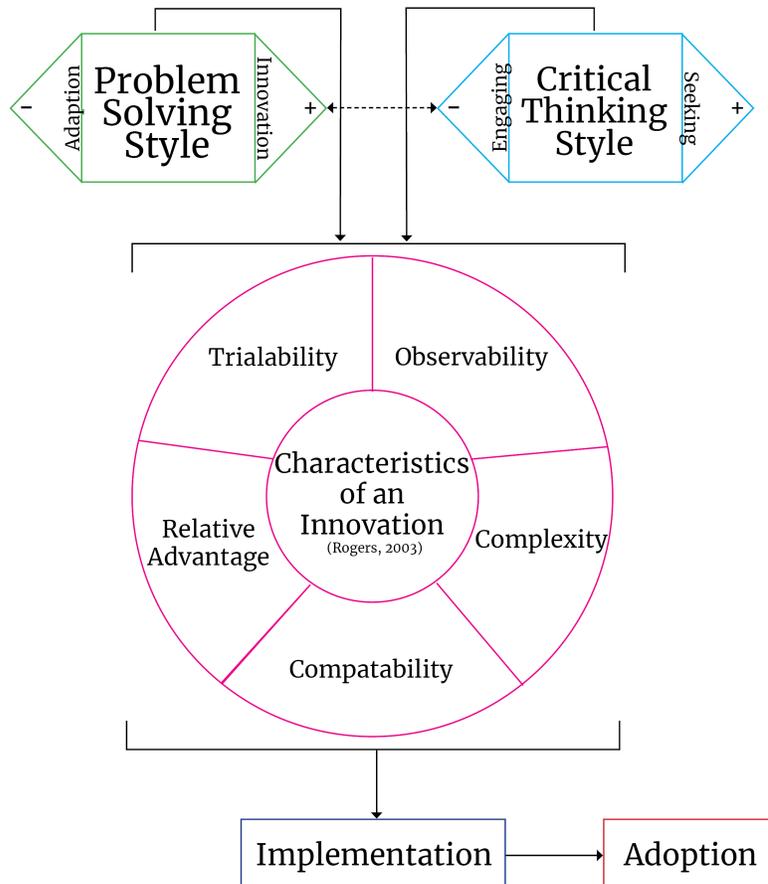


Figure 1. Conceptual model integrating critical thinking style and problem-solving style with characteristics of innovations, implementation, and adoption of water conservation technologies by greenhouse and nursery growers.

### Purpose and Objectives

The purpose of this study was to identify the most appropriate route to adoption among nursery and greenhouse growers to inform the development of effective Extension activities serving this audience. The specific objectives were to:

1. Examine how problem-solving style and critical thinking style relate to nursery and greenhouse growers' perceived characteristics of water conservation technologies;
2. Determine if there is an association between perceived characteristics of water conservation technologies and nursery and greenhouse growers' level of water conservation technology implementation; and
3. Determine if water conservation technology implementation relates to nursery and greenhouse growers' continued use (adoption) of water conservation technologies.

### Methods

## Data Collection and Target Population

We collected data during the first half of 2017. Our target population was United States greenhouse and nursery growers. We used electronic mailing and participant lists provided by extension and research professionals who worked with our target audience to secure a purposive sample of respondents ( $n = 192$ ). Of those who provided demographic information, the majority of respondents were male (73.6%;  $f = 95$ ); between 55 and 64 years of age (42.6%;  $f = 55$ ); not Hispanic or Latino (98.7%;  $f = 127$ ); and white (60.9%;  $f = 120$ ). More growers said they lived in Florida (19.4%;  $f = 25$ ) and New York (13.2%;  $f = 17$ ) than the other 31 states represented. The most common gross annual sales categories were from \$10,000 to \$99,999 (44.2%;  $f = 57$ ) and from \$1,000,000 to \$9,999,999 (20.2%;  $f = 26$ ). More than half held at least a four-year degree (62.8%;  $f = 81$ ).

## Instrumentation

We used a researcher-developed survey instrument to achieve the research objectives. Critical thinking style was measured using the UFCTI (Lamm & Irani, 2011). The UFCTI generates scores ranging from 26 to 130, with lower numbers interpreted as a preference for engaging and higher numbers interpreted as a preference for seeking (Lamm & Irani, 2011). We measured UFCTI according to published protocol (Lamm & Irani, 2011), asking respondents to *indicate the degree to which you agree or disagree with the statements as they relate to how you naturally tend to approach situations*. There were 16 statements and responses were measured on a five-point Likert-type scale from *strongly disagree* to *strongly agree*.

We measured problem-solving style using the published KAI protocol (Kirton, 1999). The KAI determines an overall score ranging from 32 to 160, with a lower number indicating an adaptive problem-solving style and a higher number indicating an innovative problem-solving style (Kirton, 1999). The KAI items were provided to respondents as a series of questions about how they solve problems. We asked them to *please use the slider next to each item listed below to indicate how easy or difficult you find it to present yourself, consistently, over a long period as the person each statement represents*. There were 32 items and possible responses ranged from 5 = *very hard* to 1 = *very easy*.

The portion of the instrument that examined perceptions of diffusion characteristics were researcher-developed. Compatibility and trialability items were measured along a five-point Likert-type scale where respondents were asked to indicate their level of agreement ranging from 1 = *strongly disagree* to 5 = *strongly agree*. To measure compatibility, four statements were used (*Water conservation technologies are easy to implement into existing facilities*, *Water conservation technologies are simple to maintain and update*, *Water conservation technologies will delay the production of goods*, and *Water conservation technologies are easy to install*). To measure trialability, three statements were used (*Water conservation technologies are easy to try*, *Water conservation technologies are readily available to test before being installed*, and *The opportunity to try water conservation technology is not available to me*).

Complexity was measured using a five-point semantic differential scale where respondents indicated their perception between five sets of adjectives along (*Complex* to *Simple*,

*Easy to understand to Difficult to understand, Clear to Unclear, Confusing to Straightforward, Complicated to Not complicated*). To measure relative advantage, respondents were asked to indicate their level of agreement or disagreement with the phrase, *Current water conservation technologies are better than what I have used in the past* on a five-point scale where 1 = *strongly disagree* and 5 = *strongly agree*.

Two multiple choice questions were used to measure observability. First, we asked *Have you had the opportunity to observe others using or demonstrating new water conservation technologies and practices you are not currently using* and respondents could indicate *yes* or *no*. Only those who answered *yes* received the second question, *How likely are you to adopt the new water conservation technologies or practices you observed someone else using?* Responses were measured on a five-point scale where 1 = *I will not install the new technology*, 2 = *Not very likely*, 3 = *Somewhat likely*, 4 = *Likely*, and 5 = *Very likely*.

To identify implementation of water conservation technologies, respondents were asked whether or not they had implemented eight water conservation technologies (rainwater capture, water reuse, microirrigation, drip irrigation, subirrigation, soil moisture sensors, climate-based irrigation, and irrigation audits) using *yes* or *no* responses. To identify adoption, we asked respondents to *please select those technologies that are still in use at your operation* from a list of any of the eight conservation technologies they indicated they had implemented previously.

We ensured the instrument was audience appropriate, relevant to the objectives of the study, and measuring what it was intended to measure (construct and face validity) by consulting with an expert panel (Ary et al., 2014; Field, 2013; Hardesty & Bearden, 2004; Haynes, Richard, & Kubany, 1995). We selected panel members who were experts in nursery and greenhouse water management, agricultural and extension programming and communication, and survey methods. Finally we pilot tested the instrument with students interested in agricultural sciences which include water conservation and horticulture and made adjustments accordingly.

## **Data Analysis**

We created a compatibility index by averaging the four compatibility scores after reverting one reversed item. Cronbach's alpha was 0.798. We created a trialability index by averaging the three trialability scores after reverting one reversed item. Cronbach's alpha was 0.612. We created a complexity index by averaging responses to the five semantic differential items after the two reversed pairs were reverted. Cronbach's alpha was 0.874. Each of these indexes could potentially range from one to five, where five indicated the most favorable conditions for adoption: the highest possible perceived compatibility, highest possible perceived trialability, and lowest possible perceived complexity.

The mean compatibility score was 3.10 ( $SD = 0.65$ ). The mean trialability score was 3.15 ( $SD = 0.89$ ). The mean complexity score was 3.36 ( $SD = 0.76$ ). The greatest frequency of responses for the relative advantage question was provided by 51.2% of respondents ( $f = 84$ ), who indicated they agreed current water conservation technologies are better than what they had used in the past. When asked how likely they were to the new water conservation technologies or

practices they observed someone else using, the greatest number of respondents (46.3%;  $f = 37$ ) indicated they were somewhat likely to do so.

We created a UFCTI score by summing the total of 16 items after those which were reverse coded were reverted and multiplied by 1.833. The mean UFCTI score was 77.87 ( $SD = 4.10$ ), meaning the average grower in our study tended toward a seeking critical thinking preference. We created a KAI score by summing the total of 32 items. The mean KAI score was 109.01 ( $SD = 11.59$ ), meaning the average grower in our study had an innovative problem-solving style.

We created an implementation score by summing the total *yes* responses to the eight water conservation technologies. Of the eight technologies, implementation score ranged from zero to seven, with the greatest number of respondents indicating they had tried either none (26.4%;  $f = 52$ ), three (18.8%;  $f = 37$ ), or one (16.2%;  $f = 32$ ) of the water conservation technologies. Similarly, we created an adoption score by summing *yes* responses to the technologies which were still in use. Adoption score ranged from zero to six with the greatest frequency of responses indicated either none (27.4%;  $f = 54$ ), one (26.4%;  $f = 52$ ), or three (16.8%;  $f = 33$ ) of the technologies they had implemented were still in use.

To examine how problem-solving style and critical thinking style influences perceived characteristics of water conservation technologies, we conducted linear regressions with KAI and UFCTI scores as the input variables and compatibility, trialability, and complexity as the outcome variables, respectively, through three independent analyses. Because relative advantage and observability were single Likert-type scale items, these variables were categorical. Therefore, we used two multinomial logistic regression analyses with KAI and UFCTI scores as the input variables and relative advantage and observability as the two separate outcome variables.

We used five linear regression analyses to determine if perceived characteristics of water conservation technologies predicted implementation. For each, the characteristic of an innovation was the input variable and the implementation index was the outcome variable. We used an additional linear regression analysis to determine if implementation influences growers' adoption of water conservation technologies, using implementation as the input variable and adoption as the outcome variable. All analyses were conducted using SPSS (version 23.0; IBM Corp., Armonk, NY).

## Results

### Examine How Problem Solving Style and Critical Thinking Style Relate to Perceived Characteristics of Water Conservation Technologies

**Compatibility.** The linear regression model was not significant ( $p = 0.30$ ), indicating problem-solving style and critical thinking style do not predict growers' perceptions of compatibility (Table 1).

Table 1

*Compatibility Predicted by Problem Solving Style and Critical Thinking Style in an Evaluation of United States Nursery and Greenhouse Growers' (n = 192) Use of Water Conservation Practices*

	$R^2$	$\beta$	$p$
Model	0.02		0.30
KAI		0.01	0.17
UFCTI		0.01	0.62

**Trialability.** The linear regression model was not significant ( $p = 0.15$ ). However, when considered separately, problem-solving style does predict growers' perceptions of trialability ( $p = 0.05$ ; Table 2).

Table 2

*Trialability Predicted by Problem Solving Style and Critical Thinking Style in an Evaluation of United States Nursery and Greenhouse Growers' (n = 192) Use of Water Conservation Practices*

	$R^2$	$\beta$	$p$
Model	0.03		0.15
KAI*		0.01	0.05
UFCTI		-0.01	0.71

Note. \* indicates significant at  $p = .05$

**Complexity.** The linear regression model was not significant ( $p = 0.22$ ), indicating problem-solving style and critical thinking style do not predict growers' perceptions of compatibility (Table 3).

Table 3

*Complexity Predicted by Problem Solving Style and Critical Thinking Style in an Evaluation of United States Nursery and Greenhouse Growers' (n = 192) Use of Water Conservation Practices*

	$R^2$	$\beta$	$p$
Model	0.024		0.22
KAI		0.01	0.20
UFCTI		0.02	0.31

**Relative advantage.** The logistic regression model was not significant ( $p = 0.80$ ), indicating problem-solving style and critical thinking style do not predict growers' perceptions of relative advantage (Table 4).

Table 4

*Relative Advantage Predicted by Problem Solving Style and Critical Thinking Style in an Evaluation of United States Nursery and Greenhouse Growers' (n = 192) Use of Water Conservation Practices*

	Log odds of changing from <i>Strongly disagree</i> to <i>disagree</i>		Log odds of changing from <i>Strongly disagree</i> to <i>neither agree or disagree</i>		Log odds of changing from <i>Strongly disagree</i> to <i>agree</i>		Log odds of changing from <i>Strongly disagree</i> to <i>strongly agree</i>		Model
	$\beta$	$p$	$\beta$	$p$	$\beta$	$p$	$\beta$	$p$	$p$
Model									0.80
KAI	4.27	0.86	-2.59	0.29	-2.10	0.39	-1.90	0.47	
UFCT	-0.13	0.96	0.06	0.82	0.04	0.88	0.01	0.97	
I									

Note. Strongly disagree was the reference.

**Observability.** The logistic regression model was not significant ( $p = 0.77$ ), indicating problem-solving style and critical thinking style do not predict growers' perceptions of observability (Table 5).

Table 5

*Observability Predicted by Problem Solving Style and Critical Thinking Style in an Evaluation of United States Nursery and Greenhouse Growers' (n = 192) Use of Water Conservation Practices*

	Log odds of changing from <i>I will not install the new technology</i> to <i>not very likely</i>		Log odds of changing from <i>I will not install the new technology</i> to <i>somewhat likely</i>		Log odds of changing from <i>I will not install the new technology</i> to <i>likely</i>		Log odds of changing from <i>I will not install the new technology</i> to <i>very likely</i>		Model
	$\beta$	$p$	$\beta$	$p$	$\beta$	$p$	$\beta$	$p$	$p$
Model									0.77
KAI	0.06	0.33	0.05	0.39	0.07	0.29	0.08	0.26	
UFCTI	0.13	0.39	0.01	0.93	0.04	0.78	0.01	0.97	

Note. I will not install the new technology was the reference.

**Determine If There is an Association Between Characteristics of Water Conservation Technologies and Their Implementation**

Four of the five linear regression models were statistically significant, indicating complexity, trialability, relative advantage, and observability predict implementation (Table 6).

Table 6

*Implementation Predicted by Compatibility, Complexity, Trialability, Relative Advantage, and Observability in an Evaluation of United States Nursery and Greenhouse Growers' (n = 192) Use of Water Conservation Practices*

	$R^2$	$\beta$	$p$
Compatibility	0.02	0.38	0.06
Complexity*	0.02	0.34	0.05
Trialability*	0.05	0.77	0.01
Relative Advantage*	0.05	0.51	0.05
Observability*	0.05	0.16	0.04

Note. \* indicates significant

### **Determine If Implementation of Water Conservation Technologies Relates to Their Adoption**

The linear regression model was statistically significant, indicating conservation implementation score is a predictor of conservation technologies still in use (Table 7).

Table 7

*Adoption Predicted by Implementation in an Evaluation of United States Nursery and Greenhouse Growers' (n = 192) Use of Water Conservation Practices*

	$R^2$	$\beta$	$p$
Implementation*	0.80	0.77	< 0.001

Note. \* indicates significant

### **Conclusions and Implications**

Through this study, we responded to the need to quantitatively examine adoption processes among nursery and greenhouse growers, as identified by Lamm, Warner, Martin, et al. (2017) and Lamm, Warner, Taylor, et al. (2017). Critical thinking style did not appear to influence perceptions of characteristics of innovations in this context. However, problem-solving style did influence one characteristic, trialability. Growers who are more innovative in problem-solving style tended to perceive they had more opportunities to try water conservation techniques before implementing them.

Four of the five Diffusion of Innovation characteristics predicted implementation of water conservation technologies among growers. Compatibility did not predict implementation ( $p = 0.06$  for the statistical regression model). It is possible compatibility did not have an effect because water conservation technologies have been available to the greenhouse and nursery industry for a considerable amount of time. Given time is critical to adoption (Rogers, 2003), it is possible that water conservation technologies are being adopted by the late majority at this point and no longer something growers would consider as being incompatible. It is also possible our sample represented early adopters. Although compatibility did not predict implementation in this study, recent work has reported that perceived incompatibility of new water conservation technologies with both grower values and physical operations as potential barriers to adoption (Lamm, Warner, Taylor, et al., 2017).

The finding that trialability, observability, complexity, and relative advantage predicted implementation was not surprising. Yet, this application of the Diffusion of Innovations in an under-examined context provides theory-based guidance for fostering adoption among nursery and greenhouse growers. Growers need to have opportunities to both observe and try out new technologies before using them. These are educational strategies Extension commonly employs through field days, trade shows, and other types of demonstrations. The findings highlight the importance of integrating and continuing the use of these methods. Growers are also in the position of needing to make the best choice for what are most often small businesses; hence, innovations need to be easy to use and have distinct advantages over other options. We were not surprised that implementation predicted adoption, and consider this study context as a possible diffusion success story.

A need exists to determine how Extension professionals can support nursery and greenhouse growers' adoption processes (Caplan et al., 2014). Through the lens of the theoretical framework presented in this research, we offer several recommendations. Because growers with more innovative problem-solving styles perceived greater levels of trialability, there is an opportunity for Extension professionals to target those growers with a more adaptive problem-solving style and provide them with opportunities to try different water conservation technologies. Following Lamm et al. (2012), Extension professionals might consider pairing growers with different problem-solving styles together when delivering programs to help encourage them to adopt water conservation technologies. Extension professionals should provide nursery and greenhouse growers with opportunities to see some of the available water conservation technologies in use. Educational materials should be designed to reduce perceptions of complexity among growers. Finally, it is important that Extension professionals help growers recognize how specific water conservation technologies may be better than what they currently use.

A new model illustrating how problem solving style influenced perceived characteristics of water conservation technologies, which in turn influenced implementation, is presented in Figure 2.

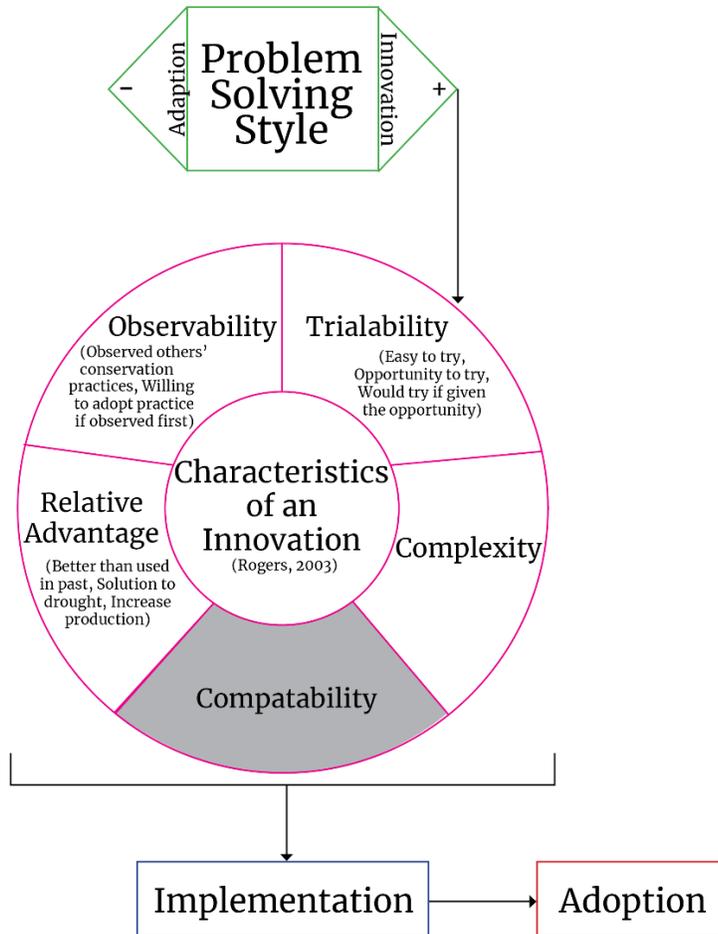


Figure 2. Final model integrating problem-solving style, characteristics of innovations, implementation, and greenhouse and nursery growers' adoption of water conservation technologies.

Because we found problem-solving styles predicted perceived trialability, we suggest further examination of this relationship. Notably, the growers who participated in our study tended toward a more innovative problem-solving style. We do not know if nursery and greenhouse growers are more innovative by nature, or if more innovative individuals opted to complete our survey. The average responses we received indicated respondents perceived the characteristics of water conservation innovations to be somewhat, although not strongly, favorable. A replication of this study using a national random sample should be conducted to determine whether our findings could be generalized to the target population.

In addition to the overall score, the KAI is comprised of three subcomponents: Sufficiency of Originality, Efficiency, and Rule/Group Conformity. Sufficiency of originality refers to the number and practicality of potential solutions, with adaptors generating fewer and more realistic solutions (Bagozzi & Foxall, 1995). Efficiency is the level of detail preferred, with innovators preferring more 'big-picture' solutions. Rule/group conformity refers to the preferred level of structure, with adaptors preferring to conform to social norms and established rules.

Future research should examine the KAI's individual components of sufficiency of originality efficiency, and rule/group conformity and how they influence perceived characteristics of innovations.

Because critical-thinking style has been shown to contribute to decision-making in an agricultural education context, we were somewhat surprised to learn that it did not predict perceptions of water-conservation innovations among nursery and greenhouse growers. Given engagers work collaboratively with others when they seek to engage in critical thinking, we expected observability and trialability to be predicted by this critical thinking style. Conversely, seekers look for information that conflicts with their beliefs and like to challenge innovation through intense information acquisition. Therefore, we expected this to be predictive of perceived relative advantage of water conservation technologies and drive perceptions of all five characteristics.

We suggest future research examine the UFCTI's individual construct scores, engagement and seeking information, separately from the overall UFCTI style score to ensure no relationships were overlooked. Our instrument allowed respondents to define observability on their own terms as we did not specify whether they should indicate direct observation from field days only, or also include reading about technologies in professional journals, magazines and the like. Future research may be used to explore this variable on a more granular level. Future researchers should consider examining some of these relationships with multivariate analyses, such as the effect of critical thinking style and problem style on the characteristics of innovations together. Our findings revealed a possible Diffusion of Innovations success story with water conservation technologies being accepted and adopted by the majority of nursery and greenhouse growers in our study. We suggest additional research should be conducted to examine newer types of innovation with this audience, such as water treatment technologies. Additionally, it would also be interesting to compare the greenhouse and nursery industry with fruit and vegetable producers that utilize irrigation and row crop producers utilizing irrigation.

### References

- Ary, D., Jacobs, L. C., Sorensen, C. K., & Walker, D. A. (2014). *Introduction to research in education*. Belmont, CA: Wadsworth, Cengage Learning.
- Bagozzi, R. P. & Foxall, G. R. (1995). Construct validity and generalisability of the Kirton Adaption-Innovation Inventory. *European Journal of Personality*, 9(3), 185–206. doi:10.1002/per.2410090303
- Blackburn, J. J., & Robinson, J. S. (2017). An investigation of factors that influence the hypothesis generation ability of students in school-based agricultural education programs when troubleshooting small gasoline engines. *Journal of Agricultural Education*, 58(2), 50–66. doi:10.5032/jae.2017.02050
- Blackburn, J. J., Robinson, J. S., & Kacal, A. (2015). Determining the effects of reflection type and cognitive style on students' content knowledge. *Journal of Agricultural Education*, 56(3), 195–209. doi:10.5032/jae.2015.03195

- Caplan, S., Tilt, B., Hoheisel, G., & Baugher, T. A. (2014). Specialty crop growers' perspectives on adopting new technologies. *HortTechnology*, 24(1), 81–87. Retrieved from <http://horttech.ashspublications.org/content/24/1/81.short>
- Chappell, M., Dove, S. K., van Iersel, M. W., Thomas, P. A., & Ruter, J. (2013). Implementation of wireless sensor networks for irrigation control in three container nurseries. *HortTechnology*, 23(6), 747–753. Retrieved from <http://horttech.ashspublications.org/content/23/6/747.abstract>
- Field, A. 2013. *Discovering statistics using IBM SPSS statistics*. 4th ed. Sage, London, England.
- Fulcher, A., & Fernandez, T. (n.d.a). *Sustainable nursery irrigation management series. Part I. Water use in nursery production* (Publication W278). Knoxville, TN: University of Tennessee Institute of Agriculture. Retrieved from <https://extension.tennessee.edu/publications/Documents/W278.pdf>
- Fulcher, A., & Fernandez, T. (n.d.b). *Sustainable nursery irrigation management series. Part II. Strategies to increase nursery crop irrigation efficiency* (Publication W279). Knoxville, TN: University of Tennessee Institute of Agriculture. Retrieved from <http://www.hrt.msu.edu/uploads/535/78629/Sustainable-Irrig-P2-TN-W280.pdf>
- Fulcher, A., Klingeman, W. E., Chong, J., LeBude, A., Armel, G. R., Chappell, M.... & Windham, A. (2012). Stakeholder vision of future direction and strategies for southeastern U.S. nursery pest research and extension programming. *Journal of Integrated Pest Management*, 3(2), D1–D8. doi:10.1603/IPM11030
- Fulcher, A., LeBude, A. V., Owen, Jr., J. S., White, S. A., & Beeson, R. C. (2016). The next ten years: Strategic vision of water resources for nursery producers. *HortTechnology*, 26(2), 345–353. Retrieved from <http://horttech.ashspublications.org/content/26/2/121.full>
- Gorham, L. M., Lamm, A. J., & Rumble, J. N. (2014). The critical target audience: Communicating water conservation behaviors to critical thinking styles. *Journal of Applied Communications*, 98(4), 42–55. Retrieved from <http://newprairiepress.org/cgi/viewcontent.cgi?article=1092&context=jac>
- Hall, C. R., Hodges, A. W., & Haydu, J. J. (2006). The economic impact of the green industry in the United States. *HortTechnology*, 16(2), 345–353. Retrieved from <http://horttech.ashspublications.org/content/16/2/345.short>
- Hardesty, D. M., & Bearden, W. O. (2004). The use of expert judges in scale development: Implications for improving face validity of measures of unobservable constructs. *Journal of Business Research*, 57(2), 98–107. doi:10.1016/S0148-2963(01)00295-8
- Haynes, S. N., Richard, D., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment* 7(3), 238–247. Retrieved from <http://support.sas.com/resources/papers/proceedings09/248-2009.pdf>
- Hodges, A. W., Hall, C. R., Palma, M. A., & Khachatryan, H. (2015). Economic contributions of the green industry in the United States in 2013. *HortTechnology*, 25(6), 805–814. Retrieved from <http://horttech.ashspublications.org/content/25/6/805.short>
- Kirton M. J. (1999). *KAI: Kirton Adaption–Innovation Inventory manual* (3rd ed.). Berkhamsted, Hertfordshire, UK: Occupational Research Centre.

- Kirton, M. J. (2011). *Adaption-innovation: In the context of diversity and change*. New York, NY: Routledge.
- Lamm, A. J., & Irani, T. (2011). *UFCTI manual*. Gainesville, FL: University of Florida.
- Lamm, A. J., Shoulders, C., Roberts, T. G., Irani, T. A., Unruh Snyder, L. J., & Brendemuhl, J. (2012). The influence of cognitive diversity on group problem solving strategy. *Journal of Agricultural Education*, 53(1), 18–30. doi:10.5032/jae.2012.01018
- Lamm, A. J., Warner, L. A., Martin, E. T., White, S. A., & Fisher, P. (2017). Enhancing extension programs by discussing water conservation technology adoption with growers. *Journal of Agricultural Education*, 58(1), 251–266. doi:10.5032/jae.2017.01251
- Lamm, A. J., Warner, L. A., Taylor, M. R., Martin, E. T., White, S., & Fisher, P. (2017). Diffusing water conservation and treatment technologies to nursery and greenhouse growers. *Journal of International Agricultural and Extension Education*, 24(1), 105–119. doi:10.5191/jiaee.2017.24111
- Lea-Cox, J.D., Zhao, C., Ross, D.S., Bilderback, T.E., Harris, J.R., Day, S.D., Hong, C., Yeager, T.H., Beeson, Jr., R.C., Bauerle, W.L., Ristvey, A.G., Lorscheider, M., Dickinson, S., and J.M. Ruter. (2010). A nursery and greenhouse online knowledge center: learning opportunities for sustainable practice. *HortTechnology*, 20(3), 509–17. Retrieved from <http://horttech.ashspublications.org/content/20/3/509.full>
- Majsztrik, J., Lichtenberg, E., & Saavoss, M. (2013). Ornamental grower perceptions of wireless irrigation sensor networks: Results from a national survey. *HortTechnology*, 23(6), 775–782. Retrieved from <http://horttech.ashspublications.org/content/23/6/775.short>
- Majsztrik, J. C., Fernandez, R. T., Fisher, P. R., Hitchcock, D. R., Lea-Cox, J, Owen, Jr., J. S. Oki, L. R., & White, S. A. (2017). Water use and treatment in containerized specialty crop production: A review. *Water, Air, & Soil Pollution*, 228, 151. doi:10.1007/s11270-017-3272-1
- Paul, R. W. (1995). *Critical thinking: How to prepare students for a rapidly changing world*. Santa Rosa, CA: Foundation for Critical Thinking.
- Perry, D. K., Retallick, M. S., & Paulsen, T. H. (2014). A Critical thinking benchmark for a department of agricultural education and studies. *Journal of Agricultural Education*, 55(5), 207–221. doi:10.5032/jae.2014.05207
- Reimer, A. P., Weinkauf, D. K., & Propoky, L. S. (2012). The influence of perceptions of practice characteristics: An examination of agricultural best management practice adoption in two Indiana watersheds. *Journal of Rural Studies*, 28(1), 118–128. doi:10.1016/j.jrurstud.2011.09.005
- Rogers, E. M. (2003). *Diffusion of Innovations* (3rd ed.). New York, NY: Free Press.
- Schaible, G., & Aillery, M. (2012). *Water Conservation in Irrigated Agriculture: Trends and Challenges in the Face of Emerging Demands*. USDA-ERS Economic Information Bulletin No. 99. Retrieved from <http://ssrn.com/abstract=2186555>
- United States Department of Agriculture. (2013). *2013 Farm and Ranch Irrigation Survey* (publication ACH12-33). Beltsville, MD: United States Department of Agriculture. Retrieved from

[https://www.agcensus.usda.gov/Publications/2012/Online\\_Resources/Farm\\_and\\_Ranch\\_Irrigation\\_Survey/](https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Farm_and_Ranch_Irrigation_Survey/)

United States Department of Agriculture. (2016). *U.S. Horticulture in 2014* (publication ACH12-33). Beltsville, MD: United States Department of Agriculture. Retrieved from [https://www.agcensus.usda.gov/Publications/2012/Online\\_Resources/Highlights/Horticulture/Census\\_of\\_Horticulture\\_Highlights.pdf](https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Horticulture/Census_of_Horticulture_Highlights.pdf)

Yeager, T., Million, J., Larsen, C., & Stamps, B. (2010). Florida nursery best management practices: Past, present, and future. *HortTechnology*, 20, 82–88. Retrieved from <http://horttech.ashspublications.org/content/20/1/82.full?sid=f4281d42-cb80-4504-afdb-13da3e4bb847>

## Discussant Remarks

### Why do Growers Adopt Water Conservation Practices? Viewing Extension Opportunities through a New Lens

Discussant: M. Craig Edwards, Oklahoma State University

#### Theoretical/Conceptual Framework

Everett Rogers' (2003) diffusion of innovations theory was expounded on regarding its applicability and use in the study and conflated with Kirton's (1999) adaption-innovation model, including its problem solving and critical thinking styles at the outset (see Figure 1), but only the former comprised the researchers' "final model" (see Figure 2). Of note, the researchers returned to the study's theoretical basis in the manuscript's final section with modification made based on the study's findings. Kudos for doing that! However, the authors are encouraged to reconsider their use and referencing of the stages of the innovation-decision process (Rogers, 2003), i.e., *implementation* and *adoption*. Does implementation of an innovation or new practice not imply that the decision to adopt, i.e., the act of adoption, has occurred? Following Rogers' (2003) terminology, would not the theory's "confirmation stage" in regard to *continued adoption* be more correct or true to his intent?

#### Methodology

Explanation of the study's design, target population, purposive sampling, data collection procedures, instrumentation, including item scaling and coding, as well as data analysis was clearly described and appeared appropriate. Describing subsets of the instrument in regard to measuring participants' perceptions vis-à-vis Rogers' (2003) characteristics (or attributes) of an innovation, in this case growers' water conservation practices, was meaningful and instructive. Same for the researchers' explanation regarding their use of the UFCTI and KAI instruments. Adding statements about *real limits* of the various Likert-type scales for the purpose of interpreting the participants' composite scores would be helpful.

#### Conclusions

The researchers' conclusions read as appropriate based on the findings offered. As mentioned above, attention to model building and adjusting an hypothesized model based on a related study's findings, *is the business in which we should be engaged* if an investigation's purpose, design, findings, and data analysis supports such. Readers are strongly encouraged to review the paper for that aspect in particular. The researchers' recommendations may hold importance for methodologists seeking to develop instruments to measure change involving adoption behaviors and adopters' associated rationales, especially if involving Rogers' (2003) and Kirton's (1999, 2011) works. The paper is recommended as an important reading for courses featuring change theories, and even more so if Rogers' diffusion of innovations is part of the syllabus. I intend to add it to mine. This research is part of a larger line of inquiry long-pursued by several if not all of the researchers, i.e., water and its use from the viewpoints of multiple stakeholders. That, itself, is highly commendable!

## **Combining School-Community Partnerships and Entrepreneurship in an Agricultural Marketing Curriculum: The Students' Perspective**

Brooke N. Griggeory, University of Kentucky  
Dr. Stacy K. Vincent, University of Kentucky  
Dr. Carol D. Hanley, University of Kentucky  
Dr. Daniel W. Kahl, University of Kentucky

### **Abstract**

*Baum (2002) believes educators do not recognize the opportunity for community partnerships to improve students' education and the community as a collective system. The school-community partnership approach is utilized as a foundational technique in development of a secondary Agribusiness Marketing Curriculum. The curriculum provides a deliberate attempt to connect rural classrooms to the community. The present research indicates that school-community partnerships established within the curriculum can potentially increase students' social capital and entrepreneurial intentions when strong, positive relationships are formed between classrooms and their community partner.*

### **Introduction**

The Appalachia region of Kentucky is recognized as the highest distressed area of the Appalachian Region Commission (Thorne, Tickamyer, & Thorne, 2004). Haaga (2004) reported Kentucky as the lowest of the 13-state region in college completion (13.7%) and the highest for high school dropouts (37.5%). Moreover, White (2012) notes that unemployment rates for rural and youth populations are higher than urban and adult population counterparts. Communities identify societal concerns such as rural brain drain (Conroy, 2000; Donovan, 2017; Estes, Estes, Johnson, Edgar, & Shoulders, 2016) as well as low civic responsibility among young adults (Flanagan, Beyers, & Žukauskienė, 2012; Wray-Lake, Syvertsen, & Flanagan, 2016) as a major cause of the unemployment rates and student motivation towards education.

To examine societal issues prevalent in communities, researchers have completed work to understand adolescent perspectives of their educational and career ambitions (Hutchins, Meece, Byun, & Farmer, 2012; Paa & McWhirter, 2000). Research conducted by Conroy (2000) expresses that rural youth still seem to associate agricultural careers with farming and ranching, explaining the disconnect of the presence of non-traditional occupations in agriculture. Consequently, she suggested secondary programs to serve a larger purpose than simply training production or laborer jobs. Conroy further proposed agricultural education programs to re-evaluate career education to more broadly explore traditional and non-traditional agricultural careers to meet existing and developing needs in the program's community. Following Conroy, researchers Roberts and Ball (2009) believe that agricultural education could assist community and societal issues by developing "(a) a skilled agricultural workforce; and (b) successful citizens that are agriculturally literate contributors in a democratic society" in which individuals move between these interconnected outcomes (p. 87). Such claims posit a need to adapt agricultural curriculum to tailor to the youth and community it serves.

## **Need for the Study**

There has been concern over the state of the United States educational system in the 21<sup>st</sup> century. In 1983, the U.S. National Commission on Excellence in Education published a report titled "A Nation at Risk", calling for reform of our nation's educational system. It focused on increasing the emphasis of science and technology classes. The report also encourages parents, schools, businesses, and civic groups to work together in enhancing education. Shadowing this recommendation, Bray, Green, and Kay (2010) further request action in preparing students for college, careers, and civic participation. The researchers suggest academies should develop student knowledge and technical skills while utilizing a collective capacity to do so.

To further assist students in their educational and occupational attainment, there has been an increased interest in identifying the opportunity for entrepreneurship education. As cited in Kourlisky (1995), seven out of ten secondary students are interested in starting their own business, but nine out of ten students rated very poor to fair regarding their entrepreneurship knowledge (Gallup Organization, Inc., 1994). Kourlisky posits education has not focused on preparing students to "make-a-job". Additionally, those whom are considered at-risk youth may have limited opportunities to get access to entrepreneurship education in the home/family environment or the school environment as compared to their peers. Kourlisky (1995) further suggests education is missing the entrepreneurship component in current curriculum – depriving students of experiencing essential entrepreneurship components such as the search for market opportunity and the risk in obtaining and investing resources. Kourlisky concludes there is a need to reassess curriculum to properly address entrepreneurship.

There is some previous research within agricultural education about incorporating entrepreneurship into secondary curriculum. As cited in Dollisso (2010), positive attitudes toward entrepreneurship have been found to best be learned in the childhood and adolescent years (Fillion, 1994; Gasse, 1985) in which high school students may become entrepreneurs and start a business after partaking in an entrepreneurship education program (Peterman & Kennedy, 2003). Dollisso conducted research asking high school agricultural teachers about their perceptions of entrepreneurship education. The researcher found nearly all the teachers believed in the importance of adding entrepreneurship into curriculum; alternatively, only a third of the teachers truly do integrate it. Dollisso recommends researchers to examine entrepreneurship education integration into secondary agricultural curriculum. It is also recommended for research to identify what teaching strategies work best to teach agricultural entrepreneurship.

## **Theoretical Framework and Supporting Literature**

The creation of the research is parallel to the ideas behind Bronfenbrenner's (2009) human ecological theory. The theory details human development as dependent on the interaction of the surrounding environment. Bronfenbrenner suggests human development and behavior can be changed – changing the culture of society and the environment as well. The aspiration of the curriculum project is to insert an intervention in secondary schools in which the environment will have an impact on the students, resulting in individuals making a change in their communities. The following provides an overview of social capital theory and the school-community partnerships approach which are foundational to the present study.

## **Social Capital Theory**

Bourdieu is the theorist who developed the social capital theory. Bourdieu (2011) defines social capital as the combination of “actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (p. 86) in which individuals use to form collectivity or community. Potential resources can consist of shared norms, identity, understanding, reciprocity, and trust. Scholars have sought to understand the role of social capital among youth's well-being (e.g., Raymond-Flesch, Auerswald, McGlone, Comfort & Minnis, 2017), rural youth's educational aspirations (e.g., Byun, Meece, Irvin & Hutchins, 2012), and status attainment (e.g., Dyk & Wilson, 1999). Social capital has been studied in contexts such as organized programs (e.g., Jarrett, Sullivan, & Watkins, 2005) and entrepreneurship (e.g., Gedajlovic, Honig, Moore, Payne, & Wright, 2013). On a larger scale, social capital has been found to take part in the prosperity of the community in which knowledge sharing increased safety (Chang, Huang, Chiang, Hsu, Chang, 2011) and facilitated collective action (Bisung, Elliott, Schuster-Wallace, Karanja, & Bernard, 2014).

**Social capital and entrepreneurship.** Kwon, Heflin, and Ruef (2013) mention there is a lack of empirical research to study how community-level social capital impacts entrepreneurship. Seeking to understand this role, the researchers found the social capital context within the individuals' community can affect entrepreneurship by subduing or boosting the possibility of being self-employed. Further conclusions were that “social capital levels are typically lowest among population segments with greater poverty and little educational attainment and among minorities (Smith, 2005; Verba, Scholozman, & Brady, 1995), partially accounting for lower levels of entrepreneurial success among these groups” (p. 1000). Because of this, marginalized members experience a drawback in comparison to their peers.

Gedajlovic, et al. (2013) recognizes social capital as a foundational theory of entrepreneurship. These authors correspondingly developed a schema model of social capital and entrepreneurship which focuses on the nature of social capital to be a multi-level flow and impact it can have based on context. They posit that social capital "antecedents lead to relationships/networks, relationships/networks lead to social capital, social capital leads to entrepreneurial and performance outcomes" (p. 457).

## **School-Community Partnership Approach**

A particular approach to creating relationships and building social capital among youth is that of school and community partnerships. This framework has been extensively studied in research and readily defined by Epstein. Epstein, Coates, Salinas, Sanders, and Simon (1997) describe the framework to involve three overlapping spheres of partnerships involving schools, family, and community. It is a partnership "with frequent interactions between schools, families, and communities [in which] more students are more likely to receive common messages from various people about the importance of school, of working hard, of thinking creatively, of helping one another and of staying in school" (p. 3). The framework is further broken-down into six types of partnership involvement: (a) parenting, (b) communicating, (c) volunteering, (d) learning at home, (e) decision making, and (f) collaborating with community. This last type is the level of involvement in which the current research seeks to employ. When collaborating with the community, students are expected to incur new skills, gain certain benefits, and gain knowledge of careers as well as future education and work opportunities. Teachers anticipate results such as becoming open and efficient in using other individuals to supplement teaching and student

learning, finding informed and supportive recommendations for families to services, and identifying community resources which enhance student learning.

Recent research supports expected results posed by Epstein, et. al (1997). Hastings, Barrett, Barbuto, and Bell (2010) found school-community partnerships to give youth ownership, responsibility, empowerment, and confidence. Community partnerships has influenced students' attitudes and perceptions about their community (Hastings et al., 2010) and college readiness and ambitions (Alleman & Holly, 2013). Research also suggests contextualized learning assists in creating importance and applicability past the classroom walls (Hastings et al., 2010). Also, Willems and Gonzalez-DeHass (2012) suggest partnerships utilize community members' proficiency to complement content, "exposing students to real-life experts during meaningful and enriching learning activities" (p. 14). A different study found a secondary veterinary program utilizing youth-adult relationships as an intra-curricular approach (Bird, Martin, Tummons & Ball, 2013). The researchers discovered students believed the partnerships facilitated change and empowerment experiences, deepened agricultural content knowledge, and provided professional and life skills. Additional research coincides with these claims (Camino & Zeldin, 2002; Jarrett, Sullivan, & Watkins, 2005; Zeldin, Gauley, Krauss, Kornbluh, & Collura, 2017).

Looking at a larger scope, Swanstrom, Winter, Sherraden, and Lake (2013) mention schools to be an essential component to building civic capacity in school-community reform efforts as schools are unifying institutions within diverse communities. Other researchers believe school-community partnerships can be powerful connections to enhancing community change for youth development and future opportunities as well as community development (Alleman & Holly, 2013; Baum, 2002; Blank & Villarreal, 2015; Fabionar & Campbell, 2010).

### **Theories and Their Role in Present Research Study**

Social capital theory and the school-community partnership approach assisted in the creation of the present Agribusiness Marketing Curriculum. The curriculum is intended to create a relationship between students and a local business. This could then increase their social capital, leading to increased entrepreneurial outcomes. The curriculum is piloted in resource-depleted counties of Kentucky. This will give at-risk youth exposure to entrepreneurship education, promoting community-wide development with the stimulation of young entrepreneurs.

### **Purpose and Objectives**

Baum (2002) believes educators do not recognize the opportunity for community partnerships to improve students' education and the community as a collective system. The developed agricultural marketing curriculum provides a deliberate attempt to connect rural classrooms to the community. This, in hopes, would indirectly create tangible and intangible outcomes such as increased student self-efficacy in entrepreneurship and/or attainment of professional social connections. Interviews will be conducted with pilot-year students in order to understand their viewpoints on the following questions: after completion of the Agribusiness Marketing Curriculum (a) do students gain an entrepreneurial mindset when school-community partnerships are present, (b) do students believe they obtained social capital, and (c) do students believe their community relationships have been impacted through the utilization of the school-community partnership curriculum? Gathering perspectives from pilot-year students will provide a deeper understanding of Agribusiness Marketing Curriculum implementation.

## Methods

Participating students receive the direct effects of curriculum instruction. To identify students’ perspectives post-curriculum instruction, a qualitative research design was utilized. According to Creswell (2014), qualitative data uses sources of information in natural settings where the researcher is the essential instrument for data collection. Interviews with student participants is conducted to understand their experiences of the curriculum. Field notes from observation visits are also taken into consideration for additional data points.

### Population and Participant Selection

Five high school agricultural educators and their students were chosen to participate. These schools were chosen by the research team following the implementation of the selection criteria (e.g. located in rural Appalachia, unemployment rates above national average; free and reduced lunch rate higher than national average; standardized assessment scores lower than the state average; graduation rate lower than state average; and teacher willing to offer an agriculture marketing course). The teachers were also chosen based on their social media proficiency and willingness to offer a year-long agribusiness course. Once schools were selected, an agribusiness in the same community was chosen by either the research team or by suggestion of the high school teacher. Schools were also partnered with their local Kentucky Small Business Development Center (KSBDC) representative. Their connection serves as an extra resource which can provide marketing expertise. The following Table 1 is a summary of the participant data. The names of students, schools, and agribusinesses are concealed in this study.

Table 1

*Participant Data (n= 96)*

School Name	Agribusiness Partner	Number of Students	Gender		Grade Levels Present			
			Female	Male	9th	10th	11th	12th
High School A	Fishery	25	4	21		X	X	X
High School B	Nursery	6	5	1		X	X	X
High School C	Farm Store	22	5	17				X
High School D	Butcher Shop	10	3	7	X		X	X
High School E	Greenhouses	33	16	17		X	X	X
Totals (n= 96)		96	33	63				

Within the five schools, there are 96 participating students participating. The students consist of all high school grade levels between the ages of 16-18 years old. Majority of students participating in the pilot year are in their senior year of high school and are males. The types of partnered businesses also vary within the agricultural industry.

### Interview Protocol

The field researcher conducted face-to-face interviews with students in their agribusiness classroom. All questions were designed by the research team to address the research objectives previously mentioned in this study. Students were interviewed at the end of the program in early May 2018. The interview included questions regarding interest in entrepreneurship, civic

entrepreneurship, school-community partnerships, and social capital in entrepreneurial community development. The student interview protocol can be found in Table 2.

Table 2

*Student Interview Protocol*

Question Theme	Interview Item	Interview Question
Entrepreneurship Interest	1	Have you ever considered starting your own business? Please explain.
	2	Are you interested in entrepreneurship (starting your own business, creating a new product or process) yourself? Why or why not?
	3	Do you know people in your community who have started their own business?
	4	Would you go to this person for advice if you were interested in entrepreneurship? Why or why not?
Civic Entrepreneurship	5	If you were to begin an effort to improve your community, what would it be? Why?
	6	Do you believe you have the skills to create positive change in your community? Why or why not? What skills do you possess? Name one.
	7	In what ways has this course helped you to imagine ways of being involved in the local business economy?
School-Community Partnerships	8	To what extent did you know about your partnered agribusiness before beginning with this project?
	9	In what ways did interacting with your partnered agribusiness change your perception of the business?
	10	How did working with your partnered agribusiness change your future career goals? Please explain.
	11	How did working with your partnered agribusiness change your feelings towards continuing education after high schools? Please explain.
	12	What new knowledge have you gained by working with your partnered agribusiness?
	13	What new skills have you gained by working with your partnered agribusiness?
	14	Do you believe that this partnership has provided you with new opportunities? Please explain.

Question Theme	Interview	
	Item	Interview Question
Social Capital in Entrepreneurial Community Development	15	Do you feel that your family and friends would support you if you decided to be an entrepreneur? Why or why not?
	16	Do you feel that other people in the community would support you? Why or why not?
	17	Do you believe there is opportunity in your community to start your own business? Please explain.

### **Data Collection Procedures**

Before schools were officially chosen to participate in piloting the Agribusiness Marketing Curriculum, the school's principal was required to send a consent letter which expresses support and commitment of their agricultural educator participating in this research project. Regarding qualitative student data collection, the field researcher made a visit to each classroom before the students were exposed to the curriculum.

Students under the age of 18 years old will receive two copies of the IRB Parent Assent form. One copy will be returned back to the researcher after it is read and signed by a guardian. The other is for their guardian's safe keeping. The researcher will read the assent form to students. Time will be given for students to ask questions about the parental assent form and their own consent. Students will then receive instruction from their agricultural education teacher during their course period over the academic year. Lastly, a face-to-face interview will occur when curriculum instruction is complete. When this time arrives, those students without parental assent or personal consent will be instructed to not participate in the researcher's interview by sitting quietly at their seats. The interview will continue with the rest of the class in a group setting.

The interviews are to be conducted once on-site during their agribusiness class period. To accompany, the external evaluator of the research team will assist in the interview sessions. In detail, the interview procedure which was enacted for consistent data collection consisted of three stages: (a) introduction, (b) interview, and (c) conclusion. To begin, the researcher will provide a brief statement which explains why the interview is being conducted and explains the interview will be recorded for transcriptions at a later time. The researcher opens discussion for any questions from the participants at this time before beginning the interview. The second part of the interview sessions will largely consist of asking the students questions in a semi-structured format. The researcher and external evaluator will begin the interview by asking the first question. Questions will be used as talking points, ensuring all are answered regardless of order. Other questions may be asked to provide clarity and probe students for more in-depth responses. In regards to the interview questions about civic entrepreneurship, these questions will only be asked after providing a definition of civic entrepreneurship. After questions are satisfactorily answered, the researchers will complete the interview by thanking participants for their time.

Throughout the duration of the interviews, notes of participant answers will be taken along with an audio recording by both the field researcher and external evaluator. This will enhance the ability to transcribe in case of audio failure. Transcriptions are also to be completed by both the field researcher and external evaluator of the research study. Interviews will be divided among the researchers to transcribe. The transcriptions will be typed up in a Microsoft Word® document, utilizing the audio recording and notes to do so. Interviews transcriptions will be edited for clarity to provide ease in readability (i.e. removal or changes to improper grammar or incomplete thoughts/sentences). All transcriptions were reviewed by both researchers together to ensure the data were correct before accepting the transcriptions as completed.

Following the transcription process, both researchers will meet to identify themes which are present within each of the transcripts. Contrast tables are then used to compare responses among the schools. Miles, Huberman, and Saldana (2014) describe contrast tables as tools that bring “together a range of representative extremes, exemplars, and/or outliers from cases into one table to explore selected variables of interest among them (p. 150).”

### **Establishing Trustworthiness**

Krefting (1991) describes Guba's Model of Trustworthiness of Qualitative Research (1981) as a model to assess the trustworthiness of qualitative data. This model consists of four components of trustworthiness: (a) truth value, (b) applicability, (c) consistency, and (d) neutrality. In order to provide these four characteristics of trustworthiness, the present researchers intentionally sought to identify and eliminate personal biases from the conduction and evaluation of the student data. The four researchers conducting the study have a background in secondary education. Each participated in the development, facilitated by the field researcher, of the Agribusiness Marketing Curriculum being implemented. Awareness of previous experiences and involvement in curriculum development biases were removed in order to not influence interpretations of interview data and maintain objectivity. In addition, the researchers removed bias of own secondary teaching experience from the interpretation of the findings. Furthermore, the addition of the external evaluator in the data collection and analysis process was included to ensure consistency and success of the interviews.

By working with participants throughout the entire curriculum implementation process, the field researcher believes this continued and familiar involvement with a single individual in their own environment will gain rapport with the participants. This is supposed to open the interviews for more honest answers on behalf of the participants. It also gave the field researcher the opportunity to make field observations about the students and their business partner which will assist in credibility, dependability, and neutrality of data analysis. The field researcher conducted at least two visits with each school for additional research opportunities. During these occasions, the researcher would compile field notes consisting of observations of relationships and interactions within classrooms and among partnerships.

### **Findings**

Qualitative interviews were conducted with participating schools in May 2018. However, High school A did not complete the research program in its entirety. Consequently, interviews

were not conducted at this school and only reflect perspectives of the other four high schools. Limited students were present in each of the four classrooms when interviews were conducted as well, resulting in a restricted scope of student responses. Reoccurring themes among the student interviews, based upon the interpretation of the two guiding theories, are featured below.

### **Reflection on Entrepreneurship**

Interview questions were developed to address the first question of curriculum implementation: after completion of the Agribusiness Marketing Curriculum, do students gain an entrepreneurial mindset when school-community partnerships are present? Interview data suggests that a few students expressed changing attitudes towards entrepreneurship. Some students viewed entrepreneurship opportunities with hesitation. A student from High School C "realiz[ed] how hard running a business [is]", revealing a deeper appreciation for entrepreneurship. Still, some students view entrepreneurship as a possibility after obtaining new knowledge about what it requires to be an entrepreneur. A student from High School B made an insightful comment about businesses in local communities: "chain stores, like Wal-Mart and Lowes, have kind of taken so much money out of the circulation and once you put more money back into your local businesses, that money gets spread around." When asked about their thoughts and intentions to create their own business, a student from High School E said "now I understand what it takes to open a business and think it is doable." A few students remarked that they wanted to start their own businesses because they wanted to work for themselves. A young woman from High School B wanted to open a woman's boutique because she wanted to work for herself and wants things to go her way – she wanted to be her own boss.

A few students also mentioned that the curriculum significantly changed their career and college plans as well as gave them a better understanding of how to start a business. A student from High School D said he was interested in physical therapy, but now he would like to obtain a minor in business. After the interview with students of High School D, field notes describe the teacher mentioning the curriculum made a difference in the future careers of two students whom were not present at the interview. Those students were interested in pursuing business in college and one was changing her major to agribusiness.

### **Reflection on Social Capital Attainment**

Additional interview questions were created to address the second question regarding curriculum implementation: do students believe they obtained social capital after completion of the Agribusiness Marketing Curriculum? The curriculum was designed to improve students' knowledge and skills by undergoing student-centered teaching. Learning was also in real-life settings through development of agribusiness marketing plans. Student interviews provided an overview of knowledge and skills gained. Most students stated they learned new things by enrolling in the agribusiness class. A theme which arose among students was their awareness of the amount of stress and difficulty in running a business. A student from High School E mentioned "the process seemed overwhelming, but when we got going, it seemed anybody could do it." This was another shared thought among students, discerning they could learn the skills necessary to be an entrepreneur. Students also mentioned they learned how to budget and

analyze data through this class. A student from High School D acknowledged that she learned more about analyzing survey research through this project. A student from High School B stated that the project “taught me how to take advantage of my strengths and weaknesses.”

Students were also to describe a need in their community and asked if they had the skills to create positive change in their communities. A student from High School B mentioned that if you believed you could do it, you could. Another student said that seeing the situation up-close-and-personal drives them to make the change. “If I knew the right kind of people, the business might work out”, said a student from High School D. Another student believed they could learn the necessary skills while others believe they possessed the communication skills and creative skills to open the needed businesses they identified in their community. Students at High School E also viewed their ability to address community needs in a positive light, wanting to address drug and alcohol addiction and prevent school shootings. A student felt they had the right ideas and could do their best to make things happen.

However, students from High School C viewed inadequate in creating change, stating “it would require much more than just us to make a change.” Students saw needs in their community for more places to eat and shop as well as partake in recreational activities. But, they were not interested or felt they had the skills to open these sorts of businesses. Though all students’ self-belief in their skills ranged from confident to unsure, the researcher’s observations noted all students had no trouble in identifying needs in their community. Students who were optimistic about their skills attainment also displayed enthusiasm towards their business partner.

### **Reflection on Partnerships with Local Agribusiness**

The curriculum was designed to improve school and community relationships through developing a relationship between students and the businesses. Some students enjoyed their partnership with their local business. The students in High School B had a good relationship with their business partners as they found their business owners eager, smart, easy-going, and almost like friends. One student stated, “I don’t feel like I am sitting down and talking to business owners. I feel like I am just sitting down and talking with a family friend.” They were proud of their input for the business and believe they have made an impact on the community, realizing the business was already implementing what they created. Field notes corroborate as High School B and E demonstrated such an excitement for their work with their local business, expressing positive thoughts towards the business as they visited and talked about and with their partner. Students at High School D and E also believed interacting with the owners changed their perceptions of the business and how to run a business. A few students at different schools explained “[they] did not even know the [business] was open,” due to the low curb appeal and lack of advertising, before their work with the curriculum.

On the other hand, interpretation of responses show that students from High School B, C, and D perceived lack of business opportunities as a barrier to the development of more complex or interesting marketing plans. One student also said seeing other businesses would have been nice to compare how different businesses operated. Another difficulty students encountered was the lack of relationship between present. In High School C, students mentioned the relationships

between the business owners and the KSBDC were not particularly strong. The students did not have much interaction with either partner, meeting with them only once. Students expressed they were unsure if the business owners would listen to the ideas they created. Further, a student mentioned “the store has potential, but I think the [business owners] want it to remain an old fashion store.” Among these students, entrepreneurial interest nor their relationships with the business owners seemed to have been affected post-curriculum implementation. The field work conducted during the students’ final presentations support this claim. The business owner present did not offer support or feedback for the students, saying only a few words in the entire visit. Similarly, students did not interact with anyone other than the teacher and their peers. These observations indicate the presence of little, if any, relationship built.

Observations made at a field visit with High School A revealed a lack of relationship between the business and students. Students remained reserved on a visit with the business owner to discuss the marketing plans. They expressed disinterest in working with the business or the product they were marketing. Students perceived there was a lack of business opportunity. These may be plausible reasons to the diminished success at this school. After reviewing the data, there seems to be a correlation appearing: students who had positive responses about their partnered business and their experience also had positive responses about their attained skills.

### **Conclusions/Implications**

Findings determined from this study are limited to the participants enrolled in an agricultural business course in five secondary schools. Each school was participating in a USDA-NIFA funded project encouraging youth-community partnerships. Although, students did not receive funding, the teachers were part of the training and management of the resources allocated; thus, it could be perceived the teachers had interest in positive results from students.

The Agribusiness Marketing Curriculum created the prospect of forming a relationship between classrooms and community members. Participants were to use the academic year to form relationships by offering donated time, ongoing effort, personal commitment and dedication, and strong communication. Those who embodied these characteristics created a thriving relationship, building a social network within their communities. This suggests that partnerships can possibly create youth and community development change (Baum, 2002; Blank & Villarreal, 2015; Fabionar & Campbell, 2010). Students who were in schools which actively engaged with their agribusiness partner demonstrated changing attitudes towards their community partner (Hastings et al., 2010) and towards entrepreneurship as a viable career option. This response signifies the relationships may have led to the attainment of social capital.

The partnerships which lacked in these areas experienced a lesser involved relationship. Given the opportunity to make changes to the curriculum, students expressed a desire to visit with their business partner more often. Students were giving suggestions on how to enhance their partnerships, demonstrating their interest and investment in this component of the curriculum. These students voiced more hesitation towards entrepreneurship. Some recommended they pick a different business in the future which was better suited to their needs. Observation and field notes from High School A, in which interviews were not conducted, suggests a deficiency of

relationship building between business partner and students may have been a cause for the lack of success at this school. These findings support the claims by Ehlen, van der Klink, and Boshuizen (2016) who place an emphasis that the quality of the social connections is an important component to the process of enduring a fruitful alliance.

The collaborative curriculum demonstrated an influence on students' future postsecondary and career plans. Though only a few, the smallest impact cannot be dismissed as these students may not have considered agribusiness as an option without the exposure to this curriculum. This insinuates awareness of non-traditional agricultural careers can create inspiration with students, supporting by Peterman and Kennedy (as cited in Dollisso, 2010) and Alleman & Holly (2013). Creating an entrepreneurial partnership may have given students a local example, or role model, of someone succeeding at being an entrepreneur. Students were given the opportunity to learn about skill sets which can be used extending past their secondary education (Hastings et al., 2010; Willems & Gonzalez-DeHass, 2012).

Furthermore, students seem to have developed a gratitude for entrepreneurship. They noted it would be a difficult career, but some are encouraged to be an entrepreneur after engaging in the curriculum. It can be postulated that exposure of entrepreneurship through a school-community partnership gave students an eye-opening encounter to what entrepreneurs are subjected to in this career field. This curriculum could give students who are considered at-risk - in which Kourlisky (1995) denotes this youth population to have a lesser opportunity - an opportunity to receive access to entrepreneurship education. Research suggests entrepreneurial intentions can be considered as the first step in the long process of creating a business venture (Lee & Wong, 2004), and are considered the single best predictor of behavior (Ajzen, 2001).

### **Recommendations for Future Research**

The researcher suggests the following four recommendations after careful analysis and reflection of student data. The first recommendation is for others to continue the development of school-community partnerships in some aspect of the schools' agricultural marketing curriculum and other content areas beyond marketing. However, it is recommended for schools to engage earlier, more frequently, and in a more substantial manner with their community businesses. Collaborating more intentionally would include more visits from the schools and businesses. Increased interactions between schools and businesses can enhance the value and depth of the relationships. It is further encouraged for teachers and/or students to choose the local business with whom they want to work. This should increase motivation for participants' involvement in the partnership. Finally, additional research should be conducted to understand what characteristics of schools and community partners should be present to create successful partnerships which foster social capital and entrepreneurial development.

### **References**

- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52(1), 27-58.  
<https://doi.org/10.1146/annurev.psych.52.1.27>

- Alleman, N. F. & Holly, L. N. (2013). Multiple points of contact: Promoting rural postsecondary preparation through school-community partnerships. *Rural Educator* 34(2), 1-11. Retrieved from <http://epubs.library.msstate.edu/index.php/ruraleducator/article/view/110>
- Baum, H. S. (2002). Proceedings from American Educational Research Association: *The Community Approach to School-Community Partnerships: Challenges and Possibilities*. New Orleans, LA: EDRS.
- Bisung, E., Elliott, S. J., Schuster-Wallace, C. J., Karanja, D. M., & Bernard, A. (2014). Social capital, collective action and access to water in rural Kenya. *Social Science & Medicine*, 119, 147-154. <https://doi.org/10.1016/j.socscimed.2014.07.060>
- Blank, M. J., & Villarreal, L. (2015). Where it all comes together: How partnerships connect communities and schools. *American Educator*, 39(3), 4-9. Retrieved from <https://eric.ed.gov/?id=EJ1076382>
- Bird, W. A., Martin, M. J., Tummons, J. D., & Ball, A. L. (2013). Engaging students in constructive youth-adult relationships: A case study of urban school-based agriculture students and positive adult mentors. *Journal of Agricultural Education*, 54(2), 29-43. doi: 10.5032/jae.2013.02029
- Bourdieu, P. (2011). The forms of capital (1986). I. Szeman & T. Kaposy (Eds.). *Cultural theory: An anthology*, 1, 81-93.
- Bray, J. B., Green, K. A., & Kay, K. (Eds.). (2010). *Up to the challenge: The role of career and technical education and 21st century skills in college and career readiness*. Washington, DC: Partnership for 21<sup>st</sup> Century Skills.
- Bronfenbrenner, U. (2009). *The ecology of human development: Experiments by nature and design*. Cambridge, Massachusetts: Harvard University Press.
- Byun, S., Meece, J. L., Irvin, M. J., & Hutchins, B. C. (2012). The role of social capital in educational aspirations of rural youth. *Rural Sociology*, 77(3), 355-379. <https://doi.org/10.1111/j.1549-0831.2012.00086.x>
- Camino, L., & Zeldin, S. (2002). From periphery to center: Pathways for youth civic engagement in the day-to-day life of communities. *Applied Developmental Science*, 6(4), 213-220. doi: 10.1207/S1532480XADS0604\_8
- Chang, C. -W., Huang, H. -C., Chiang, C. -Y., Hsu, C. -P., & Chang, C. -C. (2012). Social capital and knowledge sharing: Effects on patient safety. *Journal of Advanced Nursing*, 68, 1793-1803. doi:10.1111/j.1365-2648.2011.05871.x
- Conroy, C. A. (2000). Reinventing career education and recruitment in agricultural education for the 21<sup>st</sup> century. *Journal of Agricultural Education*, 41(4), 73-84. doi: 10.5032/jae.2000.04073

- Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Thousand Oaks, CA: SAGE.
- Dollisso, A. D. (2010) Integrating agricultural entrepreneurship into high school agriculture curriculum. *Journal of Agricultural Education*, 51(3), 125-133. doi: 10.5032/jae.2010.03125
- Donovan, E. (2017). But we don't got nothing: Countering rural brain drain by forging authentic connections through text. *English Journal*, 106(5), 46-51. Retrieved from <http://www.ncte.org/journals/ej/issues/v106-5>
- Dyk, P. H., & Wilson, S. M. (1999). Family-based social capital considerations as predictors of attainments among Appalachian youth. *Sociological Inquiry*, 69(3), 477-503. <https://doi.org/10.1111/j.1475-682X.1999.tb00882.x>
- Ehlen, C.G.J.M., van der Klink, M. R., & Boshuizen, H. P. A. (2015). Unravelling the social dynamics of an industry-school partnership: Social capital as perspective for co-creation. *Studies in Continuing Education*, 38(1), 61-85. doi: 10.1080/0158037X.2015.1030610
- Epstein, J. L., Coates, L., Salinas, K. C., Sanders, M. G., & Simon, B. S. (1997). *School, family, and community partnerships: Your handbook for action*. Thousand Oaks, CA: Corwin Press, Inc.
- Estes, H. K., Estes, S., Johnson, D. M., Edgar, L. D., & Shoulders, C. W. (2016). The rural brain drain and choice of major: Evidence from one land grant university. *North American Colleges and Teachers of Agriculture Journal*, 60(1), 9-13. Retrieved from <https://www.nactateachers.org/index.php/volume-60-number-1-march-2016/2378-the-rural-brain-drain-and-choice-of-major-evidence-from-one-land-grant-university>
- Fabionar, J., & Campbell, D. (2010). *Community-school partnerships to support youth development*. REACH Issue Brief Series. No. 2. Sierra Health Foundation.
- Flanagan, C., Beyers, W., & Žukauskienė, R. (2012). Political and civic engagement development in adolescence. *Journal of Adolescence*, 35(3), 471-473. <https://doi.org/10.1016/j.adolescence.2012.04.010>
- Gedajlovic, E., Honig, B., Moore, C. B., Payne, G. T., & Wright, M. (2013). Social capital and entrepreneurship: A schema and research agenda. *Entrepreneurship Theory and Practice*, 37(3), 455-478. <https://doi.org/10.1111/etap.12042>
- Haaga, J. (2004). *Educational attainment in Appalachia*. Washington, DC: Appalachian Regional Commission.
- Hastings, L. J., Barrett, L. A., Barbuto, J. E., Jr., & Bell, L.C. (2010). Developing a paradigm model of youth leadership development and community engagement: A grounded theory. *Journal of Agricultural Education*, 52(1), 19-29. doi: 10.5032/jae.2011.01019

- Hutchins, B.C., Meece, J. L., Byun, S., & Farmer, T. W. (2012). Planning for the future: An investigation of work-bound rural youth. *Rural Educator*, 33(2), 7-19. Retrieved from <https://files.eric.ed.gov/fulltext/EJ987616.pdf>
- Jarrett, R. L., Sullivan, P. J., & Watkins, N. D. (2005). Developing social capital through participation in organized youth programs: Qualitative insights from three programs. *Journal of Community Psychology*, 33(1), 41-55. doi:10.1002/jcop.20038
- Kourilsky, M. L. (1995). Entrepreneurship education: Opportunity in search of curriculum. Kansas City, MO: Center for Entrepreneurial Leadership Inc.
- Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *American Journal of Occupational Therapy*, 45(3), 214-222. doi:10.5014/ajot.45.3.214
- Kwon, S. -W., Heflin, C., & Ruef, M. (2013). Community social capital and entrepreneurship. *American Sociological Review*, 78(6), 980-1008. <https://doi.org/10.1177/0003122413506440>
- Lee, S. H., & Wong, P. K. (2004). An exploratory study of technopreneurial intentions: A career anchor perspective. *Journal of Business Venturing*, 19(1), 7-28. [https://doi.org/10.1016/S0883-9026\(02\)00112-X](https://doi.org/10.1016/S0883-9026(02)00112-X)
- Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: SAGE.
- National Commission on Excellence in Education. Department of Education. (1983). *A nation at risk: The imperative for educational reform. An open letter to the American people. A report to the Nation and the secretary of education*. Washington, DC: U.S. Government Printing Office.
- Paa, H. K., & McWhirter, E. H. (2000). Perceived influences on high school students' current career expectations. *Career Development Quarterly*, 49(1), 29-44. <https://doi.org/10.1002/j.2161-0045.2000.tb00749.x>
- Raymond-Flesch, M., Auerswald, C., McGlone, L., Comfort, M., & Minnis, A. (2017). Building social capital to promote adolescent wellbeing: A qualitative study with teens in a Latino agricultural community. *BMC Public Health*, 17(1), 1-9. <https://doi.org/10.1186/s12889-017-4110-5>
- 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
- Swanstrom, T., Winter, W., Sherraden, M., & Lake, J. (2013). Civic capacity and school/community partnerships in a fragmented suburban setting: The case of 24:1. *Journal of Urban Affairs*, 35(1), 25-42. doi: 10.1111/juaf.12005
- Thorne, D., Tickamyer, A., & Thorne, M. (2004). Poverty and income in Appalachia. *Journal of Appalachian Studies*, 10(3), 341-357. Retrieved from <http://www.jstor.org/stable/41446644>

- White, B. (2012). Agriculture and the generation problem: Rural youth, employment and the future of farming. *IDS Bulletin*, 43(6), 9-19. doi:10.1111/j.1759-5436.2012.00375.x
- Willems, P. P., & Gonzales-DeHass, A. R. (2012). School-community partnerships: Using authentic contexts to academically motivate students. *School Community Journal*, 22(2), 9-30. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1001611.pdf>
- Wray-Lake, L. W., Syvertsen, A. K., & Flanagan, C. A. (2016). Developmental change in social responsibility during adolescence: An ecological perspective. *Developmental Psychology*, 52(1), 130-142. <http://dx.doi.org/10.1037/dev0000067>
- Zeldin, S., Gauley, J., Krauss, S. E., Kornbluh, M., Collura, J. (2015). Youth-adult partnership and youth civic development: Cross-national analyses for scholars and field professionals. *Youth & Society*, 49(7), 851-878. <https://doi.org/10.1177/0044118X15595153>

## Discussant Remarks

### Combining School-Community Partnerships and Entrepreneurship in an Agricultural Marketing Curriculum: The Students' Perspective

Discussant: M. Craig Edwards, Oklahoma State University

#### Theoretical/Conceptual Framework

Social capital theory and its relationship to entrepreneurship, i.e., serving as “a foundational theory of entrepreneurship,” were discussed by the researchers. In addition, “school and community partnerships” as an *approach* to “building social capital among youth” was also highlighted as an important component of the study’s operational theory. The researchers explained their rationale for conflating or merging these theories/concepts as a way to create the curriculum they piloted. Overall, their explanation appeared appropriate and aided in understanding the study’s structure, intent, and anticipated outcomes. However, the researchers are encouraged to develop a figure to assist readers in visualizing what they theorized, including related antecedent variables or conditions and anticipated changes in students’ perceptions regarding entrepreneurship and their likelihood of becoming entrepreneurs. Moreover, because of a focus on instructors teaching a new curriculum, the researchers may be served by reviewing Dunkin’s and Biddle’s (1974) model, as described in their text *The Study of Teaching*, and use what they posited to more broadly conceptualize features of the present study with the abovementioned aspects nested in that modified frame.

#### Methodology

Inclusion of the study’s “student interview protocol” (see Table 2), as organized by “question themes,” was helpful to the reader. However, it is recommended additional clarity be provided regarding the study’s “agricultural marketing curriculum,” such as the main lesson topics and related objectives, student learning experiences, evaluative assignments, and so forth, as well as how the instructors were prepared to teach it. For example, “student-centered teaching” was mentioned in the findings section. How was that teaching approach operationalized and, moreover, what assurance exists that the teachers facilitated student learning by employing such practices? If the researchers were to present their curriculum as an *intervention* or a *kind of treatment*, even though the pilot study was not an experiment with a comparison group, and no claims were made that it was, a section describing the teachers’ fidelity to properly implementing said intervention may be warranted.

The researchers/authors are encouraged to revise the manuscript’s “data collection procedures” section regarding verb tense. Many of the verbs are *future tense*, but because data collection has occurred should be written as *past tense*. The discussant appreciated the manuscript’s presentation of findings, i.e., “reflection on” the study’s major constructs or themes, as expounded and supported by select students’ quotes derived from their transcribed interviews.

## Conclusions

The researchers are commended for investigating youth entrepreneurship education that involved partnerships with adult agricultural entrepreneurs in their shared communities, which intended to benefit both groups as well as other citizens by lifting a marginalized region's economy. Some of the researchers' conclusions, however, may need additional findings to further support verbiage such as ". . . created a thriving relationship" regarding students' interactions with their community partners.

An explanation of the study's funding support, i.e., it was "a USDA-NIFA funded project encouraging youth-community partnerships," arose only in the manuscript's "conclusions/implications" section. Moreover, the fact that the study's participating teachers received some "training" was also mentioned there, but with little detail. And "resources allocated" to the teachers was stated in the same paragraph (p. 11), which implied a form of incentivization occurred and suggested the need to explain that aspect of the study. The authors vetting these aspects of their study sooner in the manuscript would improve its presentation.

# The Influence of Demographic Variables on Community Members' Perceptions of Community Viability

Chantel Simpson, Virginia Tech  
Lane Woodward, Virginia Tech  
Rachel Mack, Virginia Tech  
Asha H. Shayo, Virginia Tech  
Sarah A. Bush, University of Idaho  
Rick Rudd, Virginia Tech

## Abstract

*The evaluation of community assets and resources, as well as asset use and allocation are important factors for planning the futures of sustainable communities. Local governments and agencies plan and develop communities; however, disconnections frequently exist between citizens and elected officials or agencies regarding the planning processes and community goals (Loh, 2012; Roseland, 2000). As such, many elected officials are tasked with the creation of strategic community development plans utilizing data and documentation to capitalize on community assets and increase the viability of the community (Blanke & Walzer, 2013; Beer, 2014; Cabrera & Najarian, 2015). One area of concern for developing communities is ensuring all community members are treated equally and no group is given unfair access and advantage in community planning. The Community Viability Indicator (CVI) model consists of four constructs: community sentiment, capable leaders, sustainable infrastructure, and community vision, all of which are important to the advancement or stagnation of a community. This study utilized the CVI model to collect data from citizens patronizing a local farmer's market. The researchers compared community viability indicator scores and community demographics to explore possible differences in group views of infrastructure, capable leaders, community sentiment, and community vision. The study revealed no statistical differences between identified demographic groups, indicating that community viability perceptions were similar in each demographic identified. The researchers concluded that the community studied has a positive view of community viability and that view is common across demographic groups.*

## Introduction

As society grows, the migration of citizens from rural to urban and metropolitan areas increases. As a result, many areas experience changes in their political, social, environmental, and financial conditions. In an effort to meet the challenges associated with these changes and to build or preserve community, it is imperative that communities evaluate current and future practices to enhance their community viability (Blanke & Walzer, 2013). However, communities face unique challenges in confronting their own practices and making changes towards improving community viability, as information is lacking to adequately determine which practices may need to change, and to what degree.

Historically, community development consisted of high levels of community participation and civic engagement. Community input and participation often required elected officials, as well as community stakeholders, to inform citizens about changes and explain the reasoning behind changes. However, declining community participation and the lack of transparency by many governing organizations leaves many citizens in the dark about the decision-making processes affecting the community (Handley & Howell-Moroney, 2010).

Mattson (2017) calls for a move from traditional community planning to more holistic approaches in evaluating community assets, defining community vision, and revitalizing communities experiencing decline. However, pursuing such holistic approaches can be challenging for communities without first obtaining detailed information to guide their decisions. While research highlights the importance of analyzing the investment of community resources to improve collective well-being (Flora, Flora, & Gasteyer, 2016), it remains unclear how, and to what degree, a given community's specific practices may be prescriptively linked to decisions tailored towards improved community viability.

Models such as the CVI provide communities with important knowledge to make informed decisions on community practices. Further, employment of universal indicators within models such as the CVI provide citizens with an opportunity to participate in the community development process (Blanke & Walzer, 2013). Citizens can accomplish this by sharing their perceptions of community viability, thereby establishing a benchmark by which communities can measure the satisfaction or perceptions of the community with its planning and development initiatives (Blanke & Walzer, 2013).

Including all members of the community in changes and providing access to community resources for all is a challenge for communities around the world. Often, groups are left out of the planning processes and many experience poor access to community assets. Inclusion supports a society that is healthy, social, and equal (Shorthall, 2008). In urban environments inequities between education and health act as social determinants affecting overall population health. Access or lack of access to these resources often impacts vulnerable populations more frequently than other groups within the community, exacerbating other community issues (Cohen & Schuchter, 2013). Considering access for all members of a community is a critical step in the planning process and for healthy community viability. It is therefore important to recognize and identify where demographic groups differ, or are similar, in their perceptions of their community's viability.

This study focused on demographic groups represented by patrons at a farmer's market in a rural community. The study was designed to capture responses of participants to the CVI instrument and assess their perceptions of community sentiment, capable leaders, community vision, and community infrastructure. Gauging community members' perceptions of these indicators is important in identifying differences and similarities in community demographic groups, and for informing community decision making. Identifying factors affecting community viability, and involving key individuals, such as Extension educators, can help improve community leadership (Ricketts & Place, 2009). In the present study, the researchers believe the patrons were likely influenced by a sense of community belonging, and participating in community food cultures that serve as indications of community sentiment (Aucoin & Fry, 2015).

## **Purpose and Objectives**

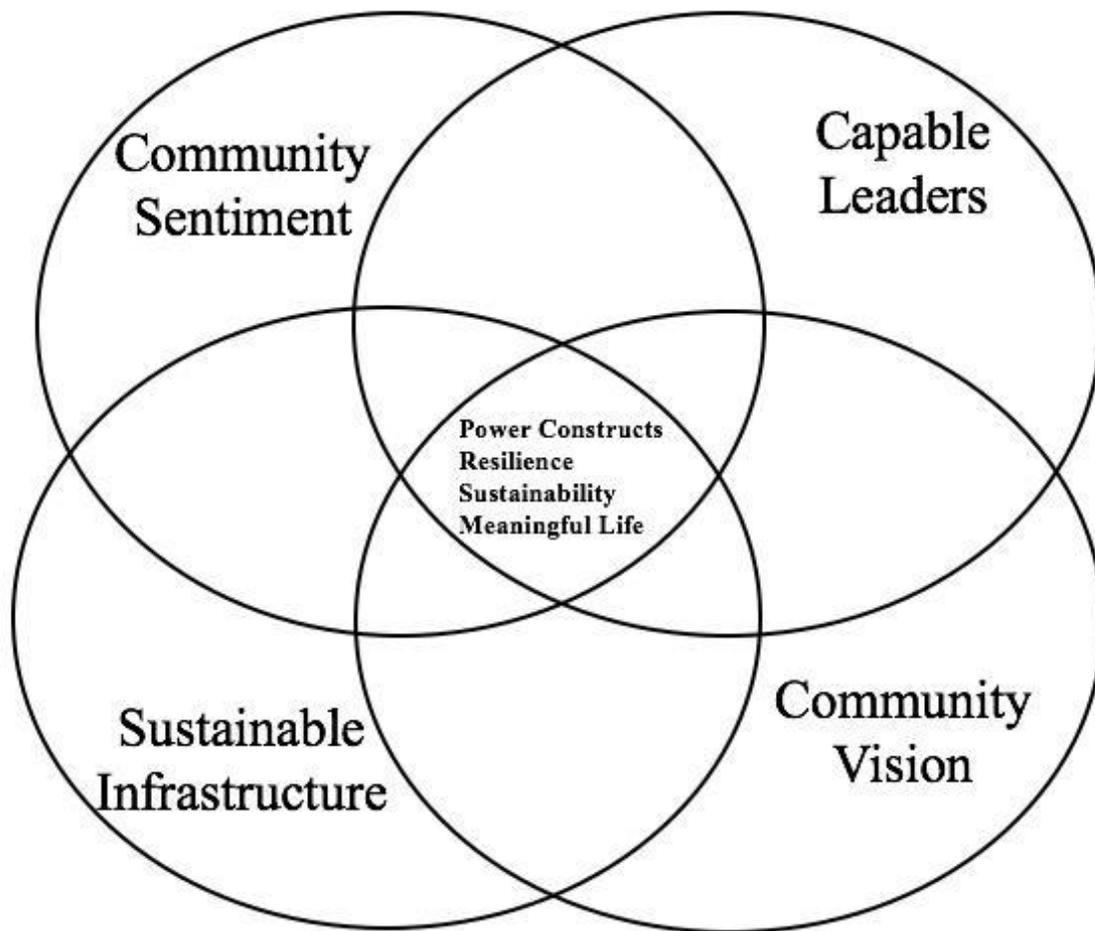
The purpose of this study was to investigate the influence of demographic variables on community members' perceptions of community viability based on their scores on the Community Viability Indicator (CVI) instrument. The viability of a community is imperative to its long-term endurance and sustaining of values (Hogg, Bush, Rudd, & Seibel, 2016). By understanding the needs of community citizens and utilizing the indicators of viable communities, community leaders can better align priorities to increase community vision, capable leaders, community sentiment, and sustainable infrastructure. This research aligns with research priority six of the American Association for Agricultural Education National Research Agenda, *Vibrant, Resilient Communities* (Graham, Arnold, & Jayaratne, 2016) by examining how diversity may impact perceptions of one's community. The following objectives guided this study:

1. Describe the CVI scores and demographic characteristics of community members.
2. Examine the differences between community members' demographic characteristics and their score on the CVI.

## **Literature Review**

Community demographics play an important role in shaping many facets of the community, including economics. As the populations within regions grow larger or smaller, it is inherent that community demographics will change. Community sentiment, leadership, vision, and infrastructure must be positioned in a way that is flexible enough to meet these changing demographics. Communities have the capacity to implement laws and ordinances that influence inclusion or exclusion of various groups within the community, impacting the community's viability. Housing, zoning, annexation, local and national politics, as well as labor markets, are all influenced by demographics of the community and by those with positions of influence and power (Hall, Tach & Lee, 2016). In order to make decisions that are beneficial to its citizens and shifting demographics, communities must continually work to build and maintain community pride, develop and invest in community resources, articulate a clear vision and goals for the community, and develop partnerships to address community issues with input from all community members (Kukovic, 2018). The increased participation of citizens within community governance processes allows for heightened visibility of issues, however, it does not always result in increased influence over community matters (Levine, 2017). In this study, community is defined in terms of geographic location, recognizing persons residing within a certain geographical area (Bradshaw, 2008). This study utilizes the definitions from the U.S. Census to define the terms rural and urban. Rural is defined as a population that is outside of an urbanized area or urban cluster. Urbanized areas more specifically encompass populations of 50,000 or more, and urban clusters encompass population of at least 10,000 persons, and less than 50,000 (Ratcliffe et al., 2016).

Hogg et al. (2016) identified four indicators of viable communities, which encompass the CVI model: community sentiment, capable leaders, sustainable infrastructure, and community vision. Each of the indicators intersect to share dependency for the concepts of power, resilience, sustainability, and the opportunity to live a meaningful life (Hogg et al., 2016).



*Figure 1: Community Viability Indicator Model (Hogg et al., 2016)*

Figure 1 depicts the Conceptual Model of Community Viability, denoting the concepts of power, resilience, sustainability, and opportunity to lead a meaningful life, which are set at the confluence of the diagram to denote their salience within each of the indicators.

Community sentiment is indicative of enthusiasm, tradition, identity, and cultural competency, and can also be presented as the collective public opinion on a topic (Bush, 2017; Evans et al., 2015). Enthusiasm and tradition in communities can often be associated with social cohesion and community engagement, contributing to the success of a community (Alter, 2005; Wilkinson, 2008). In addition, community identity or collective identity among residents in a community has implications for the development and exhibition of cultural identity and competencies relevant to community growth and development, such as belongingness (Colombo & Senatore, 2005). Belongingness is a central tenant to community sentiment or well-being, which is dependent upon a positive level of social capital that binds residents of a community together interdependently, allowing for cooperation between community members, and leading towards positive community growth. Alternatively, fragmented communities lacking positive social capital and community sentiment may not be as prosperous (Block, 2009). Politically, community sentiment often echoes the collective values of persons in the community and has

implications for shifting and shaping the political landscape, which in turn will further develop or shape the community (Chamberlain, 2015).

Both formal and non-formal structures, as well as opinions, influence capable leadership. The role of community leaders is salient to the viability of the community as they work through issues related to governance with local leaders and other power brokers in the community (Beer, 2014). Strategic and inclusive and transparent engagement among community leaders and community members increase community membership and affirm the membership of existing citizens within the community (Purdue, 2001). Through engagement with citizens community leaders can create and sustain change in a community (Block, 2009). Capable community leadership has the potential to create and strengthen partnerships, driving an increase in social capital and community engagement through the development of a cohesive community vision. This cohesion transforms into community goals increasing cooperation between various community stakeholders towards a community vision, further developing leaders and community sentiment.

Community vision relates to strategic thinking and planning, long term goals, and investment in the future (Bush, 2017). This process of community visioning signifies the development and fostering goals among community members that can energize the community. Community vision is marked specifically by shared goals or citizen “buy-in” and connectedness to the goals (French & Gagne, 2010). These goals and future plans often identify the traits that the community wants to develop to move forward in the future, in addition to sometimes reshaping the culture of the community (Bargen, 1996).

Sustainable infrastructure refers to the accessibility and availability of resources such as healthcare, education, and employment in addition to other services related to the fulfillment of basic needs. Resources are often scarce; therefore, the appropriate allocation of resources is paramount to the development and maintenance of a sustainable community infrastructure (Thomson, 2008).

Constructs related to power in communities often relate to ones’ sense of agency or ability to use assets to benefit the community (Zimmerling, 2005; Hogg et al., 2016). Community resilience, refers to the ability of a community to rebuild or rebrand during and after a significant event such as a natural disaster in addition to community development initiatives (Faulkner, Brown, & Quinn, 2018). Similarly, sustainability refers to the opportunities of communities to preserve themselves and meaningful life refers to the ability of the community to meet the needs of its citizens (Hogg et al, 2016). The combination of these four tenets of community viability and the central tenets offer an insight into the variables required to increase and maintain community viability. A common thread that is interwoven tightly throughout these concepts is community capitals (Emery & Flora, 2006) which facilitates the development of each of these parameters as citizens and other stakeholders communicate and work together towards common goals.

### **Farmers Markets and Communities**

Farmers markets play a unique role in communities and can serve a number of sociological capacities including economic and entrepreneurship opportunities, decreasing barriers, increasing resource accessibility, and strengthening social capital as well as providing access to nutritious, locally produced goods and foods (Alia, Freedman, Brandt, & Browne,

2014; Brown & Miller, 2008; Dollahite, Nelson, Frongillo, Griffin. 2003). Aucoin and Fry (2015) indicated that “sense of place”, participating in the community, and identifying as a community member influence farmer’s market patronage. This creates local food cultures that are heavily indicative of community sentiment. The patronage of farmer’s markets may also fill many of the sub-categories within sustainable infrastructure, capable leaders, community sentiment and community vision by providing access to food, informal education opportunities, and providing citizens with the opportunity to invest within their communities by purchasing goods and services from local business owners (Alia et al., 2013; Dodds et al., 2014).

## **Demographics**

This study was conducted in an urban cluster. The overall population of the region is approximately 180,000 people with an upward trending population growth. Historically, counties within the region have been considered to be a rural area, however population growth within cities housing the local universities have re-identified the region as a metropolitan area, despite the heavy concentration of residents in areas external to the colleges (Data – Virginia’s New River Valley, n.d.; USDA-ERS). A research study in Ontario by Dodds et al. (2014) found that the majority of farmer’s market consumers to be partnered females and over the age of 40. Few participants identified as an ethnic minority (Dodds et al, 2014). Data collected during this study found similar gender, age and marital demographics, confirming research by Rice (2014) who also found most farmer’s market patrons to be older white women (Rice, 2014).

## **Methods**

The research team designed the pilot study to examine the effect the demographic characteristics of community members on CVI scores. The research team implemented convenience sampling as an exploratory method for preliminary data examination (Ary, Jacobs, Irvine, & Walker, 2018). The researchers recruited the population sample at a local farmers market. The researchers selected the location because of the large number of people who shop at the market. The researchers believed this location would differ from the previous research by Rice (2014) since the market is in a college town and is utilized by the university and the overall community. Data was collected over a six-hour period of time on both Wednesdays and Saturdays during one month for a total of 48 hours of data collection.

## **Instrumentation**

The research team utilized a 21-item instrument to measure community vision, capable leaders, community sentiment and sustainable infrastructure. Participants self-reported their attitudes and perceptions of community viability using a Likert scale. The instrument used a five-point Likert scale to allow for individuals to place their communities on a range between “strongly disagree”, “disagree”, “neutral”, “agree”, or “strongly agree”. The research team measured the coefficient of reliability of the CVI instrument using a Cronbach’s alpha. From the analysis the Cronbach alpha for the CVI instrument was .777 for the community member data. Based on Cronbach (1951) the Cronbach  $>.7$  is acceptable for usage, which suggest that the item responses are relatively consistent. The instrument provides insight on overall views of community viability and areas for community concentration and to aid in making decisions related to community development. In addition to the CVI instrument a demographic instrument was used to collect data to compare CVI scores between demographic groups.

## Sample and Data Collection

All adult community members, age 18 or older were eligible regardless of sex, health status or ethnicity. The researchers collected a total of 196 participants from the [Town] Farmers Market. It was observed that 42% of the sample who attended the Blacksburg Farmers Market were from outside the local area. Many of those from outside of the area were likely students at the local university. The research team did not have a maximum number of individuals to survey for this pilot study. Participation was voluntary and anonymous. The research team chose this recruitment effort to attempt to reach a broad array of community members from varying backgrounds. These locations and community events provide a space where community members are actively engaged in a community activity.

The research team visited the Blacksburg Farmers Market during open times on Wednesdays and Saturdays for data collection. During each occasion two researchers used the approved IRB letter and a consent form to recruit participants through a face to face approach. The research team approached the community attendees of Blacksburg Farmers Market and request their participation in the study. The CVI instrument cover page included an introductory letter and information regarding implied consent. The research team briefed the participants on the consent information and requested they review the form prior to completing the instrument and demographic survey. It was assumed that any individual who reviews the consent form and takes the survey consented to participation. The consent was obtained before any data collection occurred. In addition, the research team provided Quick Response (QR) codes and a URL for participants who were willing to complete electronically at a later time. The paper survey took participants approximately 5-10 minutes to complete. Only one participant completed the survey in the electronic format using the provided QR code.

## Data Analysis

The research team utilized SPSS to analyze the data (version 24.0; IBM Copr., Armonk, NY). The research team conducted three analyses; descriptive statistics so as to describe the basic features of the data, Simple Linear Regression to summarize the relationship between the group variables, and One-way ANOVA to compare the groups means and their performance (Howell, 2011). The descriptive statistics used to describe the sample were min, max, mean, and standard deviation. These statistics were used in answer research objective one in an effort to describe the demographics of participants. Both the Simple Linear Regression and One-way ANOVA were used by the researchers to answer research objective two by examining the relationships among demographics and CVI scores.

## Results

This study collected data on community members' perceptions of community viability through the CVI instrument. Participant's scores on the CVI instrument ranged from 34 to 97 with a mean of 73.05 and had a standard deviation of 11.33. Ages of participants ranged from 18 to 84 with a mean age of 45.92. The standard deviation for participants' ages was 14.43. The time participants spent living in the community ranged from less than one year to 68 years with a mean of 16.64 years and a standard deviation of 15.14. Of the participants 55.61% were male ( $n=104$ ,  $M=73.47$ ,  $SD=11.73$ ) and 43.39% were female ( $n=83$ ,  $M=74.23$ ,  $SD=10.94$ ). The community members self-reported their ethnicities with 90% being White ( $n=162$ ,  $M=73.43$ ,  $SD=11.61$ ), 2.22% being Black/African American ( $n=4$ ,  $M=70.25$ ,  $SD=9.54$ ), 2.78% being Asian

( $n=5$ ,  $M=74.00$ ,  $SD=11.73$ ), 1.11% being Hispanic/Latino ( $n=2$ ,  $M=76.00$ ,  $SD=1.41$ ), 2.22% being Multiracial ( $n=4$ ,  $M=73.75$ ,  $SD=11.53$ ), and 2.22% falling into the other category ( $n=4$ ,  $M=79.00$ ,  $SD=10.68$ ). For marital status, the majority of participants, 71.2%, were married ( $n=131$ ,  $M=74.02$ ,  $SD=10.60$ ). Other participants listed their marital status as single ( $P=22.82\%$ ,  $n=42$ ,  $M=73.38$ ,  $SD=11.36$ ), separated/divorced ( $P=2.72\%$ ,  $f=5$ ,  $M=73.00$ ,  $SD=8.03$ ), and other ( $P=3.26\%$ ,  $n=6$ ,  $M=65.00$ ,  $SD=17.81$ ).

Participant identified occupations were coded into 11 different categories. The most common occupations were self-employed/business ( $P=18.33\%$ ,  $n=33$ ,  $M=77.03$ ,  $SD=8.01$ ); education ( $P=16.11\%$ ,  $n=29$ ,  $M=73.00$ ,  $SD=11.11$ ); engineering, architecture, and science ( $P=15\%$ ,  $n=27$ ,  $M=71.19$ ,  $SD=12.64$ ); social services and personal care ( $P=13.33\%$ ,  $n=24$ ,  $M=72.54$ ,  $SD=10.50$ ); retired ( $P=9.44\%$ ,  $n=17$ ,  $M=74.59$ ,  $SD=14.25$ ); and healthcare ( $P=8.89\%$ ,  $n=16$ ,  $M=73.60$ ,  $SD=13.63$ ). The majority of participants had household incomes higher than \$70,000 a year with 15.2% of participants making \$70,000-\$90,999 a year ( $n=26$ ,  $M=73.19$ ,  $SD=12.20$ ), 25.73% making \$100,000-\$149,999 a year ( $n=44$ ,  $M=77.41$ ,  $SD=9.33$ ), and 29.24% making more than \$150,000 a year ( $n=50$ ,  $M=71.88$ ,  $SD=11.34$ ). From the participants 57.69% were local ( $n=105$ ,  $M=73.30$ ,  $SD=10.80$ ), 23.63% were from a town within the state of [State] ( $n=43$ ,  $M=70.19$ ,  $SD=12.24$ ), and 18.68% were from out of state ( $n=34$ ,  $M=77.23$ ,  $SD=11.66$ ).

Table 1

*Range, Mean, and Standard Deviation for CVI Score, Age, and Time in the Community and Frequencies, Percentages, Means and Standard Deviations for Demographic Variables (N=196)*

<b>Variables</b>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>
CVI Score	34	97	73.05	11.33
Age	18.00	84.00	45.92	14.53
Length of Time in Community	.02	68.00	16.64	15.14
	<i>f</i>	<i>P</i>	<i>M</i>	<i>SD</i>
Gender ( $n=187$ )				
Male	104		72.47	11.73
Female	83	44.39	74.23	10.94
Ethnicity ( $n=180$ )				
White	162	90.00	73.43	11.61
Black/African American	4	2.22	70.25	9.54
Asian	5	2.78	74.00	11.73
Hispanic/Latino	2	1.11	76.00	1.41
Multiracial	4	2.22	73.75	11.53
Other	4	2.22	79.00	10.68
Marital Status ( $n=184$ )				
Single	42	22.82	73.38	11.36
Married	131	71.20	74.02	10.60
Separated/Divorced	5	2.72	73.00	8.03
Other	6	3.26	65.00	17.81
Occupation ( $n=180$ )				
Education	29	16.11	73.00	11.11
Laborer	10	5.56	70.00	9.36

Student	10	5.56	74.40	11.35
Social Services/Personal Care	24	13.33	72.54	10.50
Self-employed/Business	33	18.33	77.03	8.01
Healthcare	16	8.89	73.06	10.50
Retired	17	9.44	74.59	14.25
Engineering/Architecture/Sciences	27	15.00	71.19	13.64
Arts	7		77.57	9.18
U		3.89		
Homemaker	5	2.78	73.60	13.63
Unemployed	2	1.11	51.50	12.02
Income ( <i>n</i> =171)				
Less than \$20,000	13		69.69	11.75
]		7.60		
\$20,000-\$29,999	12	7.02	73.50	11.97
\$30,000-\$39,999	6	3.51	73.00	10.94
\$40,000-\$49,999	7	4.09	70.14	6.12
\$50,000-\$69,999	13	7.60	74.77	13.75
\$70,000-\$99,999	26	15.20	73.19	12.20
\$100,000-\$149,999	44	25.73	77.41	9.33
More than \$150,000	50	29.24	71.88	11.34
Community/Town of Residence ( <i>n</i> =182)				
Local	105	57.69	73.30	10.80
Out of Town	43	23.63	70.19	12.24
Out of State	34	18.68	77.23	11.66

Note. CVI scores can range from 21 to 105 points.

Objective two sought to examine the differences between community members' perceptions of community viability on the CVI instrument and demographics. The researchers used linear regression to determine if age or length of time in the community significantly predicted CVI score. The results indicated no significant relationships between length of time in the community and age on CVI score. The researchers utilized one-way ANOVAs to determine main effects between gender, ethnicity, marital status, occupation, income, and community of residence. The main effects for gender, ethnicity, marital status, occupation, and income did not differ based on CVI score. A main effect was found based on community of residence,  $F(2, 183) = 3.17, p < .05$ .

Table 2

*Differences between CVI Scores Based on Demographic Variables*

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Age ( <i>n</i> =192)	.002	.003	.046	.631	.529
Length of Time in Community ( <i>n</i> =192)	.001	.003	.037	.449	.618
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
<i>Gender</i> ( <i>n</i> =192)					
Between Groups	1	.232	.232	.789	.375

Within Groups	190	55.755	.293		
<i>Ethnicity (n=186)</i>					
Between Groups	5	.360	.072	.240	.944
Within Groups	180	53.988	.300		
<i>Marital Status (n=189)</i>					
Between Groups	3	1.091	.364	1.333	.265
Within Groups	185	50.467	.273		
<i>Occupation (n=185)</i>					
Between Groups	10	3.978	.398	1.404	.182
Within Groups	174	49.293	.283		
<i>Income (n=175)</i>					
Between Groups	7	2.230	.319	1.140	.340
Within Groups	167	46.666	.279		

---

Note. Significance at the \*p <.05 level, 2-Tailed.

### **Conclusions**

The use of models such as the CVI informs communities and researchers on the impacts of community practices for community viability. The previous research supports the concepts behind the CVI model's four indicators of community viability: community sentiment, capable leaders, sustainable infrastructure, and community vision (Hogg et al., 2016). Farmers market participants demonstrate indicators of community sentiment (Aucoin & Fry, 2015), and the interconnected and overlapping nature of the indicators of the CVI model show that this study's information helps to further focus each component of the CVI model's framework.

The researchers investigated whether demographic characteristics indicated differences in community members' perceptions of community viability. No significance was found using ANOVA and the linear regression in analysis of study variables. Therefore, the CVI score is equally affected by participants regardless of demographic variables. This result is particularly significant because the overall CVI scores for the community were high, which indicates a viable community where members have equal access and share in vision. These findings demonstrate the inclusivity of the community, which encourages equal input during development and community planning.

The results reflect the community of focus. Limitations of the study included lack of broad generalizability to other populations, and the fact that participants' demographics were spread geographically. Because this study was intended to investigate residents of the community and a difference between residency groups was found, it is important that this instrument be used with individuals that reside in the community of focus. However, the information from this study can guide future research in community viability using models such as the CVI, and may be used in that context to inform the development of research in other populations. This research advances the use of the CVI model by providing additional insight

into the overlapping nature of the model's indicators, and helps to define the edges of some of these indicators in the community of focus.

### **Recommendations**

Hogg et al. (2016) developed the CVI model as a universal indicator, allowing it to be utilized within various communities, regardless of urban or rural designation. Therefore, this instrument is beneficial in its applicability to a wide variety of populations, and is well suited for utilization for research in communities. Future research should focus on using the CVI model to determine the influence, or lack thereof, of other variables to help communities in identifying trends toward gauging their community viability. Shifting focus to a wider variety of demographic variables allows for a deeper exploration of the CVI model in an effort to ensure the instrument continues to function as a universal indicator for a variety of populations. Continued research adds to the development and refinement of the instrument as items or variables that impact a community member's CVI score are identified.

The use of the CVI model to examine community practices is helpful towards analyzing community actions that promote community well-being. Future research should continue to examine the use of the CVI model in communities to determine where, and to what degree, the CVI model indicators overlap for communities of study. Knowing this information will assist communities in developing a snapshot of their communities, and will guide inclusive decision-making processes in making changes to community practices towards increased community viability.

### **References**

- Aarsaether, N., Riabova, L., & Baerenholdt, J. O. (2004). Community viability. *Arctic Human Development Report*, 139-153.
- Alia, K.A., Freedman, D.A., Brandt, H.M., & Browne, T. (2013). Identifying emergent social networks at a federally qualified health center-based farmers' market. *American Journal of Community Psychology*, 53(3-4), 335-345.
- Alter, J. (2005). Victories of volunteerism, community needs, member enthusiasm, connections that clicked: All helped shape summit award-winning efforts to improve society. *Association Management*, 57(1). Retrieved from <http://login.ezproxy.lib.vt.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edsbig&AN=edsbig.A128175286&site=eds-live&scope=site>
- Aucoin, M., & Fry, M. (2015). Growing local food movements: Farmers' markets as nodes for products and community. *The Geographical Bulletin*, 56(2), 61-78. Retrieved from <http://login.ezproxy.lib.vt.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=110721614&site=eds-live&scope=site>
- Bargen, D. (1996) Community visioning and leadership. *Journal of Leadership Studies*, 3(3), 135-162.
- Beer, A. (2014). Leadership and the governance of rural communities. *Journal of Rural Studies*, 34, 254-262.

- Blanke, A. S., & Walzer, N. (2013). Measuring community development: What have we learned?. *Community Development*, 44(5), 534-550. doi:10.1080/15575330.2013.852595
- Bradshaw, T.K. (2008). The post-place community: Contributions to the debate about the definition of community. *Community Development*, 39(1), 5-16.
- 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), 1296-1302.
- Bush, (2017). *Instrument Development Part 1, 2, 3, 4, &5*. Unpublished manuscript, [Department], [University], [Town], [State].
- Cabrera, J. F., & Najarian, J. C. (2015). How the built environment shapes spatial bridging ties and social capital. *Environment and Behavior*, 47(3), 239-267. doi:10.1177/0013916513500275
- Chamberlain, J. (2015). Community sentiment and the law: Concluding thoughts and future directions. In Miller, M., Blumenthal, J., & Chamberlain, J. (eds.) *Handbook of Community Sentiment* (pp. 269-280). New York, NY: Springer.
- Cohen, A. K., & Schuchter, J. W. (2013). Revitalizing communities together: The shared values, goals, and work of education, urban planning, and public health. *Journal of Urban Health*, 90(2), 187-196. doi:10.1007/s11524-012-9733-3
- Colombo, M. & Senatore, A. (2005). The discursive construction of community identity. *Journal of Community Applied Social Psychology*, 15(1), 48-62. doi: 10.1002/casp.809
- Data-Virginia's New River Valley (n.d.). Retrieved December 28, 2017, from <https://www.newrivervalleyva.org/data/>
- Dodds, R., Holmes, M., Arunsopha, V., Chin, N., Le, T., Maung, S., & Shum, M. (2014). Consumer choice and farmers' markets. *Journal of Agricultural and Environmental Ethics*, 27(3), 397-416. doi:10.1007/s10806-013-9469-4
- Dollahite, J.S., Nelson, J.A., Frongillo, E.A., Griffin, M.R. (2003). Building community through enhanced collaboration in the farmers market nutrition program. *Agriculture and Human Value*, 22(1), 339-354. doi:10.1007/s10460-005-6050-4
- Emery, M. & Flora, C. (2006). Spiraling-Up: Mapping Community Transformation with Community Capitals Framework. *Journal of the Community Development Society*, 37(1), 19-35.
- Evans, M. D. R., Peoples, C. D., & Kelley, J. (2015). Using secondary survey data to study community sentiment: An example examining sentiment toward income based on family needs and income. Miller, M., Blumenthal, J., & Chamberlain, J. (eds.) *Handbook of Community Sentiment* (pp. 69-82). New York, NY: Springer.
- Faulkner, L. Brown, K., & Quinn, T. (2018). Analyzing community resilience as an emergent property of dynamic social-ecological systems. *Ecology and Society*, 23(1), 24-34 doi:10.5751/ES-09784-230124

- Flora, C. B., Flora, J. L., & Gasteyer, S. P. (2016). *Rural communities: Legacy & change* (5<sup>th</sup> ed.). Boulder, CO: Westview Press.
- French, C. A., & Gagne, M. (2010). Ten years of community visioning in New Hampshire: the meaning of “success.” *Community Development*, 41(2), 223-239.
- Hall, M., Tach, L., & Lee, B. A. (2016). Trajectories of ethnoracial diversity in American communities, 1980-2010. *Population and Development Review*, 42(2), 271–297. <https://doi-org.ezproxy.lib.vt.edu/http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291728-4457/issues>
- Handley, D. M., & Howell-Moroney, M. (2010). Ordering stakeholder relationships and citizen participation: evidence from the community development block grant program. *Public Administration Review*, 70(4), 601-609.
- Hogg, D., [Bush], [Rudd], & Seibel, M. (2016). *Viability indicator for rural communities*. Unpublished manuscript, Agricultural, Leadership, and Community Education, Virginia Tech, Blacksburg, VA.
- Howell, D.C. (2011). *Statistical methods for psychology (8th ed.)*. Belmont, CA: Wadsworth.
- Kukovic, S. (2018). Coping with demographic challenges: Case of Slovenian local communities. *Journal of Comparative Politics*, 11(2). Retrieved from <http://login.ezproxy.lib.vt.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=130868883&site=eds-live&scope=site>
- Levine, J. R. (2017). The Paradox of Community Power: Cultural Processes and Elite Authority in Participatory Governance. *Social Forces*, 95(3), 1155–1179. Retrieved from <https://doi-org.ezproxy.lib.vt.edu/10.1093/sf/sow098>
- Loh, C.G. (2012). Four potential disconnects in the community planning process. *Journal of Planning Education and Research*, 32(1), 33-47.
- Mattson, G.A. (2017). *American hometown renewal: Policy tools and techniques for small town officials*. New York, NY: Routledge.
- Purdue, D. (2001). Neighbourhood governance: Leadership, trust and social capital. *Urban Studies*, 38(12), 2211-2224.
- Ratcliffe, M., Burd, C., Holder, K., & Fields, A. (2016). Defining rural at the U.S. census bureau,” Census Bureau, Washington, DC Retrieved from [https://www2.census.gov/geo/pdfs/reference/ua/Defining\\_Rural.pdf](https://www2.census.gov/geo/pdfs/reference/ua/Defining_Rural.pdf)
- Rice, J. S. (2015). Privilege and exclusion at the farmers market: Findings from a survey of shoppers. *Agriculture and Human Values*, 32(1), 21-29. doi:10.1007/s10460-014-9513-7
- Ricketts, K. G., & Place, N. T. (2009). Making communities more viable: Four essential factors for successful community leadership. *Journal of Extension* 47(2), Retrieved from <https://joe.org/joe/2009april/iw2.php>

- Ring, J. K., Peredo, A. M., & Chrisman, J. J. (2010). Business networks and economic rural communities in the United States. *Entrepreneurship: Theory and Practice*, 34(1), 171-195.
- Roseland, M. (2000). Sustainable community development: Integrating environmental, economic and social objectives. *Progress in Planning*, 54(2), 73-132.
- Shorthall, S. (2008). Are rural development programmes socially inclusive? Social inclusion, civic engagement, participation, and social capital: Exploring the differences. *Journal of Rural Studies*, 24, 450-457. doi:10.1016/j.jrurstud.2008.01.001
- Thomson, D.E. (2008). Strategic, geographic targeting of housing and community development resources: a conceptual framework and critical review. *Urban Affairs Review*, 43(5), 629-662.
- Wilkinson, D. (2008). Individual and community factors affecting psychological sense of community, attraction, and neighboring in rural communities. *Canadian Review of Sociology*, 45(3), 305-329.
- Zimmerling, R. (2005). *Influence and Power: Variations on a Messy Theme*. Dordrecht, The Netherlands: Springer. Retrieved from <http://login.ezproxy.lib.vt.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=150613&site=eds-live&scope=site>

## **Discussant Remarks**

### **The Influence of Demographic Variables on Community Members' Perceptions of Community Viability**

Discussant: M. Craig Edwards, Oklahoma State University

#### **Theoretical/Conceptual Framework**

The researchers' "Community Viability Indicator" (CVI) model presented in the manuscript appeared appropriate as a guiding conceptual framework for the study and was helpful to the discussant as a consumer of their scholarship. The text explaining its important aspects was informative and additive. The proposed model may be useful to other researchers or policymakers interested in the phenomenon of community viability and what that implies regarding significant actors and forces, including the behaviors of such, and the related effects or consequences.

#### **Methodology**

The study was essentially survey questionnaire research reliant on a purposive sample, participants at a farmers' market on several Wednesdays and Saturdays, i.e., not a probabilistic or randomly selected sample. If that is correct, the discussant is uncertain about the researchers' use of inferential statistics – Simple Linear Regression and One-way ANOVA – as tools for data analysis. If literature exists rationalizing or supporting said analysis, the researchers are encouraged to cite such. Further, an overall Cronbach's alpha reliability estimate was reported for all 21 items comprising the study's survey instrument, i.e., ".777," and considered "acceptable." It appeared several constructs existed within the instrument. Therefore, would it have been more appropriate and meaningful to report the constructs' alphas to substantiate the instrument's reliability, especially regarding internal consistency?

As noted by the researchers, "42% of the sample" was "from outside the local area," and assumed to be college students. It appeared these respondents were included in the study's data analysis. So, regarding the study's purpose and related response frame parameters, these individuals were members of, or at least participants in, the hypothesized "community," correct? Some additional clarification about that may be warranted. Was testing for differences between CVI scores based on "length of time in the community" (see Table 2) the researchers' approach to accounting for what could have been findings of significance or practical importance due to participants' variant responses regarding that independent variable? (The researchers addressed this potential contradiction as a limitation of the study in the manuscript's conclusions section.)

It was stated as a table note (see Table 1) that "CVI scores can range from 21 to 105." So, how should said scores be interpreted; in other words, "What would a score of 35 mean or imply versus a score of 96 regarding citizens' views on their community's viability?" (It is recommended that Table 1 be divided or separated into two tables and the same for the existing Table 2 to create four separate tables in all. Some of the descriptive data may have questionable or negligible relevance, especially as reported in the manuscript's "instrumentation" section. The researchers are encouraged to reconsider the components of that section if other presentations or

journal submissions are planned for the future.)

### **Conclusions**

*Community viability* is an important line of inquiry with innumerable implications and consequences for U.S. society and elsewhere. The researchers are commended for pursuing its study and striving to *add some bricks to the wall of literature* regarding community development and the many variables that subsumes. Moreover, it represents a portfolio of research needs that more forward-leaning departments housing our confederation of disciplines – agricultural communications, education, extension, leadership, community development, among others – should be addressing while equipping the next generation of scholars and practitioners to confront the embedded issues, challenges, and opportunities. That said, stressing the roles of these disciplines in the service of measuring and seeking to improve a community's viability, including through related recommendations, may more transparently convey actionable takeaways for the manuscript's readers. The researchers are encouraged to state such to the extent their conclusions support doing that.

## **Factors Impacting Civic Responsibility Development During FFA Civic Engagement Activities**

William A. Bird, University of Tennessee at Martin  
Amanda Bowling, The Ohio State University  
Anna Ball, University of Missouri

### **Abstract**

*This study's purpose was to determine the influence of involvement level, autonomy, and reflection during FFA civic engagement activities on students' self-perceived civic responsibility levels. The study utilized a quasi-experimental, non-equivalent comparison group design. The treatment consisted of two groups: an experimental reflection group and a control group. Four school-based agriculture programs agreed to participate, providing a time and place sample of 282 respondents. Simultaneous multiple linear regression models explained significant variance in students' levels of self-perceived civic responsibility scores using a linear combination of involvement level, autonomy, and structured guided reflection. Data analysis revealed positive, statistically significant relationships between the autonomy and reflection variables and youths' perceived levels of civic responsibility. These findings can inform educator practices for designing FFA civic engagement programming.*

### **Introduction and Conceptual Framework**

Adolescent youth potentially experience a variety of positive developmental opportunities during structured civic engagement activities (Lerner, 2017). During adolescence, individuals are more open to learning civic concepts than in any other time period and are thus more likely form civic values (Vézina & Poulin, 2017). Furthermore, it may be their last opportunity to equip themselves as productive contributors to society (Finlay, Wray-Lake, & Flanagan, 2010). Civic engagement allows youth to explore their identity beyond the familial home, acquire the societal norms of the adult world, and develop a positive connection to society (McIntosh, Metz, & Youniss, 2005). To initiate the steps of becoming engaged contributors to society, however, adolescent youth must first be presented the opportunity to become involved in civic engagement activities (Hart & Atkins, 2002; Jacobsen & Casalaspi, 2016; Langston, 1987).

Many school-based FFA chapters provide opportunities for rural youth to become involved with civic engagement activities through FFA programming (Horstmeier & Ricketts, 2009; National FFA Organization, 2018). FFA civic engagement activities provide crucial civic education opportunities for agriculture students in a variety of settings (National FFA Organization, 2018). These activities are especially important when schools and surrounding communities have limited civic engagement outlets for youth (Brandell & Hinck, 2005; Lin, 2015; Skinner & Chapman, 1999). FFA programming often utilizes civic engagement activities at the local, state, and national levels to develop students' citizenship and interpersonal skills (Ricketts & Ricketts, 2011). Further, as a result of civic engagement, individuals form stronger bonds with other community members, enhance their community pride, and increase their concern for improving the status of the community (Flanagan & Faison, 2001).

Civic engagement activities are deeply imbedded within all levels of FFA programming. However, this component of FFA programming remains largely unexamined. Thus, current FFA civic engagement practices may not reach their full potential for student development. Additionally, for FFA programming to develop responsible civic attitudes, it is crucial that these groups utilize effective methods to facilitate civic engagement experiences (Lin, 2015).

We developed a conceptual model (see Figure 1) based on existing youth development civic engagement literature. The literature revealed three variables that potentially create impactful civic engagement experiences: autonomy experienced prior to and during civic engagement experiences, structured reflection following civic engagement experiences, and involvement level (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Furco, Jones-White, Huesman, & Gorny, 2016; Lin, 2015; Pearce, Walker, & Larson, 2005; Waterman, 1997).

The first variable of the conceptual model was involvement level in civic engagement activities. In civic education, youth develop a deeper sense of civic responsibility when higher involvement intensity in civic engagement experiences is maintained (Furco & Billig, 2002). Rarely does one single experience significantly change the social beliefs of an individual (Rose-Krasnor, Busseri, Wiloughby, & Chalmers, 2006) and significant personal change requires extended exposure to events that challenge an individual's beliefs (Dewey, 1933). Further, adolescents "maximize the potential for intrapersonal growth and interpersonal advantages" when exposed to numerous learning situations with distinguishing developmental outcomes (Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006, p. 1322). Civic attitudes will not significantly change unless the youth are presented with long-term exposure to civic problems.

The second variable of interest was autonomy experienced by students before and during each civic engagement activity. Educational environments facilitate autonomy when students experience feelings of volition, perceived control, internally perceived locus of causality, and a desire to continue an activity in the future (Reeve, 2006). Volition refers to doing an activity free from external pressure such as extreme incentives or punishments. Perceived control involves making conscious decisions affecting the outcome of an activity. Perceived locus of causality represents an individual's internal choice to attempt an activity. The desire to continue an activity often indicates an individual's feelings of competence established during an activity (Reeve, 2002). Autonomy experienced during FFA civic engagement potentially provides students an opportunity for ownership in the experience and ultimately results in enhanced learning (Hanckock, Dyk, & Jones, 2012; Parker et al., 2009; Warter & Grossman, 2002).

Structured reflection was the third and final variable of interest. Time for youth to critically process the lived civic engagement experience is a critical component to successful, meaningful, and developmentally constructive civic engagement (Billig, 2000; Caspersz & Olaru, 2017). Reflection reinforces civic behaviors and attitudes desired by youth development programs (Wikenfeld, Lauckhardt, & Torney-Purta, 2010). Structured collaboration between youth and adults develops youth participants' moral reasoning and awareness of community issues (Vialle, Lysaght, & Verenikina, 2000). Post-event reflection by youth increases their personal investment for improving community problems and allows them to have a more powerful intellectual experience when consistently utilized (Eyler, Giles, & Braxton, 1995; Greene & Diehm, 1995). Additionally, when youth continuously self-assess their own abilities from civic engagement experiences, they develop an enhanced level of civic responsibility (Levine & Higgins-D'Alessandro, 2010). Structured reflection provides a critical opportunity for

youth to meaningfully process the experience and ultimately reach higher levels of understanding and belief in their own civic attitudes (Caspersz & Olaru, 2017).

We conceptualized the outcome of civic engagement experiences as an individual’s self-perceived level of civic responsibility. Civic responsibility encompasses three dimensions: connection to the community, awareness of existing community needs, and civic efficacy (Balsano, 2005; Evans & Prilleltensky, 2005; Furco, Muller, & Ammons, 1998; Lin, 2015; McGuire & Brown, 2015). Connection to the community means an individual perceives interconnectedness to and can relate to other community members (Balsano, 2005; Mondak & Gearing, 1998). Community needs awareness signifies an individual’s ability to identify and resolve existing communal issues (Evans & Prilleltensky, 2005). Civic efficacy is the mindset that an individual can and should solve existing community problems (Giles & Eyster, 1994; McGuire & Brown, 2015). We developed a conceptual model (see Figure 1) using existing youth development and civic engagement literature to guide the current investigation.

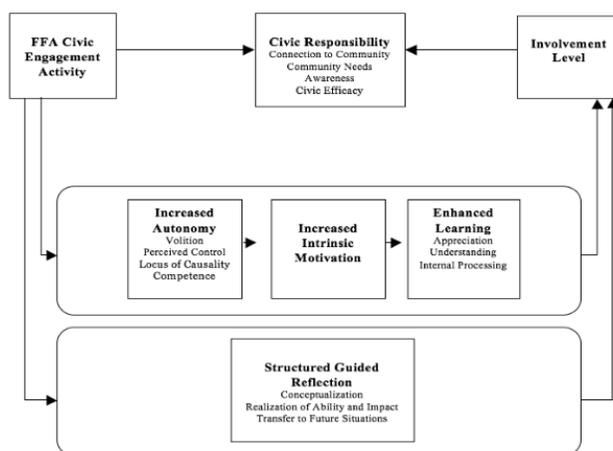


Figure 1. Conceptual model of FFA civic engagement activity critical components

### Purpose and Objectives

The purpose of this study was to determine the influence of involvement level, experienced autonomy, and reflection during FFA civic engagement activities on students’ self-perceived civic responsibility. The following research objectives guided the study:

1. Describe students’ involvement by frequency of participation and hours engaged.
2. Describe students’ level of self-perceived experienced autonomy.
3. Describe students’ levels of self-perceived civic responsibility.
4. Determine if a linear relationship exists between involvement level, autonomy, and reflection and students’ levels of self-perceived civic responsibility.

### Methods

This study utilized a quasi-experimental, nonequivalent control group pretest-posttest design, which is well suited for research on existing intact groups, such as FFA chapters (Ary, Jacobs, & Sorensen, 2010; Shadish, Cook, & Campbell, 2002), that cannot be randomly assigned

to groups to establish equality (Shadish et al., 2002). The target population was all [STATE] students enrolled in school-based agricultural education (SBAE) programs with FFA chapters completing the National Chapter Award during the academic school year prior to data collection ( $N = 3336$ ). Nine SBAE programs were purposefully identified based on accessibility, resulting with four programs as the final usable sample due to FFA civic engagement activities being conducted throughout all data collection time periods ( $n = 282$ ). Each FFA chapter sponsored a wide range of civic engagement activities, including events such as school-wide blood drives, weekend litter collections, community recycling drives, and a variety of other community improvement initiatives. We viewed these students as a time and place sample and deemed the results inferable to past and future individuals within the four FFA chapters (Oliver & Hinkle, 1982). Respondents self-reported themselves as mostly 15 years old, male, in 9th grade, white, having lived on a rural farm, and having grades of mostly A's and B's.

We created a paper and pencil questionnaire for data collection that contained three sections measuring: involvement level and autonomy, civic responsibility, and demographic characteristics. To establish validity and reliability, a panel of experts ( $n = 7$ ) assessed the face and content validity, and a pilot study of similar students ( $n = 28$ ) resulted in Cronbach's alpha range of .71 to .93 for all constructs (Nunnally, 1978). Data collection occurred over a 21-month period, with four collection points and random assignment of the treatment (control or reflection) occurring after the third collection point (see Table 1). Prior to this research project, none of the four participating programs provided structured reflection following civic engagement activities. The reflection process was adapted from the Six Step Civic Reflection Process (Bradley, 1997) and was reviewed by the panel of experts. FFA advisors of the two programs randomly assigned to the reflection treatment group were provided training on reflection protocol expectations, as well as scripted reflection questions to ask students immediately following civic engagement activities. For the purpose of data analysis, the reflection component was treated as a dichotomous variable.

Table 1  
*Graphic Representation of the Research Design*

Group	Pretest			Assignment	Treatment	Posttest
	Period 1	Period 2	Period 3			Period 4
School 1	$O_1$	$O_2$	$O_3$	Random	Control	$O_4$
School 2	$O_1$	$O_2$	$O_3$	Random	Control	$O_4$
School 3	$O_1$	$O_2$	$O_3$	Random	$X_{\text{Reflection}}$	$O_4$
School 4	$O_1$	$O_2$	$O_3$	Random	$X_{\text{Reflection}}$	$O_4$

The first section of the questionnaire assessed the number of FFA civic engagement activities each student participated in, the amount of time involved in each activity, and the level of autonomy students experienced during each activity. The autonomy scale consisted of four constructs: (a) volition—the student participated without positive or negative influence from others; (b) perceived control—the student was given opportunities to make important decisions before, during, or after the activity; (c) locus of causality—the student participated because it was internally meaningful to them; and (d) continued involvement—the student had aspirations to continue involvement in that activity in the future on their own (Reeve, 2002). Responses were based on a six-point Likert-type scale with anchors of 1 = *Strongly Disagree*, 2 = *Disagree*,

3 = *Slightly Disagree*, 4 = *Slightly Agree*, 5 = *Agree*, and 6 = *Strongly Agree*. A higher numeric value indicated a higher level of agreement with each construct.

The second section of the instrument measured students' self-perceived levels of civic responsibility and consisted of three constructs: (a) connection to the community—students felt they had a relationship with their community; (b) community needs awareness—students felt they could identify existing societal issues; and (c) civic efficacy—students felt they had the skills and ability to positively influence community issues (Furco, Muller, & Ammons, 1998). Responses were based on a six-point Likert-type scale with anchors of 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Slightly Disagree*, 4 = *Slightly Agree*, 5 = *Agree*, and 6 = *Strongly Agree*. A higher numeric value indicated a higher level of agreement with each construct.

We used descriptive statistical analysis to address Objectives 1, 2, and 3. To address Objective 4, we used a simultaneous multiple linear regression to explain the variance in students' levels of self-perceived civic responsibility. We tested basic assumptions and detected a violation of normality for the time students engaged in civic engagement activities. All other assumptions were upheld (Field, 2009). Due to the lack of normality, the findings are limited to the study participants. Following assumption testing, we entered the predictor variables into the regression model simultaneously to explain variance related to each individual construct of civic responsibility. For all statistical analyses, alpha levels were set a priori at  $\alpha = 0.05$ .

## Findings

Objective 1 was to describe the frequency of student involvement in FFA civic engagement activities (see Table 2). The vast majority of students ( $n = 259$ ; 91.80%) participated in at least one FFA civic engagement activity at some point across the four time periods. Twenty-three (8.20%) students never participated in any FFA civic engagement activities. Students most frequently participated in only one FFA civic engagement activity ( $n = 59$ ; 20.90%).

Table 2

*Frequency of Student Participation in FFA Civic Engagement Activities (n = 282)*

Level of Participation	School 1 (n = 58)		School 2 (n = 59)		School 3 (n = 137)		School 4 (n = 28)		Total (n = 282)	
	f	%	f	%	f	%	f	%	f	%
0 Activities	5	8.60	3	5.10	14	10.20	1	3.60	23	8.20
1 Activity	4	6.90	14	23.70	41	29.90	0	0.00	59	20.90
2 Activities	9	15.50	11	18.60	38	27.70	0	0.00	58	20.60
3 Activities	7	12.10	6	10.20	16	11.70	1	3.60	30	10.60
4 Activities	5	8.60	12	20.30	19	13.90	5	10.70	41	14.50
5 Activities	6	10.30	2	3.40	4	2.90	3	7.10	15	5.30
6 Activities	5	8.60	2	3.40	2	1.50	2	14.30	11	3.90
7 Activities	5	8.60	2	3.40	3	2.20	0	0.00	10	3.50
8 Activities	0	0.00	3	5.10	0	0.00	4	14.30	7	2.50
9 Activities	4	6.90	2	3.40	0	0.00	3	10.70	9	3.20
10 Activities	1	1.70	1	1.70	0	0.00	2	7.10	4	1.40
11 Activities	3	5.20	0	0.00	0	0.00	3	10.70	6	2.10

12 Activities	0	0.00	1	1.70	0	0.00	2	7.10	3	1.10
13 Activities	3	5.20	0	0.00	0	0.00	1	3.60	4	1.40
14 Activities	0	0.00	0	0.00	0	0.00	1	3.60	1	0.40
15 Activities	1	1.70	0	0.00	0	0.00	0	0.00	1	0.40

*Note.* FFA chapters offered a maximum of 15 civic engagement activities.

Additionally, we measured the amount of time students were engaged in FFA civic engagement activities during all four time periods (see Table 3). Students from School 1 ( $n = 58$ ) had the highest level of time spent engaged in FFA civic engagement activities with an average of 123.29 hours ( $SD = 169.93$ ) per student. Students from School 4 ( $n = 28$ ) had the second highest level of time, with an average of 74.46 hours ( $SD = 73.35$ ) per student engaged in FFA civic engagement activities. Next was School 2 ( $n = 59$ ) with an average student engagement time of 26.08 hours ( $SD = 38.92$ ) per student in FFA civic engagement activities. School 3 ( $n = 137$ ) had the lowest overall level of time spent with an average of 20.47 hours ( $SD = 51.85$ ) per student.

Table 3

*Time Students Were Engaged in FFA Civic Engagement Activities (n = 282)*

FFA Chapter	Period 1		Period 2		Period 3		Period 4		Total	
	<i>M</i>	<i>SD</i>								
School 1 ( $n = 58$ )	32.22	56.53	47.98	75.16	24.90	62.67	18.19	64.83	123.29	169.93
School 2 ( $n = 59$ )	14.03	27.96	6.03	16.21	1.46	3.65	4.56	14.43	26.08	38.92
School 3 ( $n = 137$ )	10.76	47.13	1.24	4.29	5.64	8.35	2.91	10.47	20.47	51.85
School 4 ( $n = 28$ )	9.89	12.00	9.14	11.57	36.11	42.46	19.32	29.71	74.46	73.35

*Note.* Time is presented in hours.

Objective 2 was to describe students' levels of self-perceived experienced autonomy during FFA civic engagement activities (see Table 4). A total of 259 students participated in one or more FFA civic engagement activities; we excluded students with no participation ( $n = 23$ ) from the analysis. Students from all four schools agreed that they had experienced volition while participating in FFA civic engagement activities. The volition construct mean scores ranged from 4.68 ( $SD = 0.86$ ) to 5.17 ( $SD = 0.66$ ) across all schools. Students from School 1 showed the highest level of volition ( $M = 5.17$ ;  $SD = 0.66$ ), followed by students from School 4 ( $M = 5.01$ ;  $SD = 0.52$ ). Regarding experiencing a sense of perceived control, students from School 1 ( $M = 3.82$ ;  $SD = 1.28$ ) and School 4 ( $M = 3.53$ ;  $SD = 1.05$ ), on average, slightly agreed. Respondents slightly disagreed with having experienced perceived control at School 3 ( $M = 3.05$ ;  $SD = 1.23$ ) and School 2 ( $M = 2.89$ ;  $SD = 1.21$ ). Students from School 1 ( $M = 5.11$ ;  $SD = 0.64$ ) and School 4 ( $M = 5.06$ ;  $SD = 0.60$ ) agreed they had sensed that they were the locus of causality. Respondents slightly agreed that they had experienced a sense of locus of causality at School 3 ( $M = 4.50$ ;  $SD = 1.07$ ) and School 2 ( $M = 4.33$ ;  $SD = 1.02$ ). Finally, students from School 1 had the highest

level of indication that they would continue participation in civic engagement activities ( $M = 5.43$ ;  $SD = 0.58$ ), followed by students from School 4 ( $M = 5.41$ ;  $SD = 0.43$ ).

Objective 3 was to describe students' levels of self-perceived civic responsibility (see Table 5). The analysis included all respondents ( $n = 282$ ), regardless of their level of involvement. In regard to feeling connected to their community, students from School 1 ( $M = 4.58$ ;  $SD = 0.77$ ) and School 4 ( $M = 4.73$ ;  $SD = 1.00$ ) reported overall agreement. Respondents indicated they slightly agreed with feeling a connection to their community at School 3 ( $M = 4.48$ ;  $SD = 0.84$ ) and School 2 ( $M = 4.22$ ;  $SD = 0.86$ ). Students from all four schools slightly agreed with feeling aware of their communities' needs with scores ranging from 3.59 ( $SD = 0.89$ ) to 4.29 ( $SD = 1.00$ ). Students from School 1 ( $M = 4.16$ ;  $SD = 0.92$ ), School 3 ( $M = 3.84$ ;  $SD = 0.97$ ), and School 4 ( $M = 4.28$ ;  $SD = 1.02$ ) slightly agreed on having experienced a sense of civic efficacy.

Objective 4 was to determine if a linear relationship existed between involvement level, autonomy, and reflection and students' levels of self-perceived civic responsibility. We used a simultaneous multiple linear regression. The first regression model (see Table 6) analyzed the selected predictor variables on students' connection to community mean scores. Overall, the first regression model explained 25% of variance (adjusted  $R^2 = 0.22$ ) in students' connection to community mean scores ( $F_{9, 272} = 9.91$ ;  $p \leq .05$ ). The independent variable autonomy–locus of causality ( $t = 3.45$ ;  $p = .01$ ) was found to significantly explain variance in connection to community construct mean scores. The level of participation during Periods 1 through 3 ( $t = 1.77$ ;  $p = .08$ ), level of participation during Period 4 ( $t = -0.10$ ;  $p = .92$ ), time in each civic engagement activity during Periods 1 through 3 ( $t = -0.48$ ;  $p = .63$ ), time in each civic engagement activity during Period 4 ( $t = 0.80$ ;  $p = .43$ ), autonomy–volition ( $t = 1.26$ ;  $p = .21$ ), autonomy–perceived control ( $t = -0.96$ ;  $p = .34$ ), autonomy–continued participation ( $t = 1.21$ ;  $p = .23$ ), and structured reflection provided ( $t = 1.52$ ;  $p = .13$ ) did not explain a statistically significant amount of variance in the connection to community construct.

Table 6

*Explained Variance in Students' Connection to Community (n = 282)*

Variable	<i>R</i>	<i>R</i> <sup>2</sup>	<i>b</i>	$\beta$	<i>t</i> -value	Sig.
Model	.50	.25				.01*
Level of civic engagement participation						
Periods 1–3			.06	.14	1.77	.08
Period 4 (following reflection)			.01	-.01	-0.10	.92
Time in each civic engagement activity						
Periods 1–3			.00	-.03	-0.48	.63
Period 4 (following reflection)			.00	.05	0.80	.43
Autonomy constructs						
Volition			.11	.09	1.26	.21
Perceived control			-.05	-.06	-0.96	.34
Locus of causality			.35	.32	3.45	.01*
Continued participation			.12	.11	1.21	.23
Structured reflection provided			.25	.09	1.52	.13

---

(Constant)	1.50
------------	------

---

*Note.* Adjusted  $R^2 = .22$ ;  $F_{9, 272} = 9.91$ ;  $*p \leq .05$ .

Table 4

*Levels of Self-Perceived Autonomy Experienced during FFA Civic Engagement Activities (n = 259)*

Autonomy construct	Period 1			Period 2			Period 3			Period 4			Total		
	<i>n</i>	<i>M</i>	<i>SD</i>												
School 1															
Volition	49	5.09	0.80	34	5.25	0.72	34	5.30	0.77	24	5.44	0.82	53	5.17	0.66
Perceived control	49	3.82	1.38	34	3.94	1.43	34	4.09	1.30	24	4.42	1.25	53	3.82	1.28
Locus of causality	49	5.03	0.88	34	5.27	0.61	34	5.31	0.74	24	5.35	0.65	53	5.11	0.64
Continued participation	49	5.51	0.63	34	5.45	0.69	34	5.41	0.67	24	5.42	0.69	53	5.43	0.58
School 2															
Volition	34	4.93	0.80	46	4.65	1.05	15	4.57	0.92	56	4.68	0.93	56	4.68	0.86
Perceived control	34	3.40	1.12	46	2.73	1.29	15	3.64	1.26	56	2.89	1.44	56	2.89	1.21
Locus of causality	34	4.80	0.73	46	4.16	1.17	15	4.87	1.11	56	4.33	1.06	56	4.33	1.02
Continued participation	34	5.29	0.78	46	4.68	1.25	15	5.43	0.69	56	4.76	0.88	56	4.76	1.12
School 3															
Volition	54	5.10	0.82	23	4.82	0.92	96	4.88	1.10	60	5.26	0.84	123	4.93	0.94
Perceived control	54	3.07	1.29	23	2.96	1.58	96	3.22	1.46	60	3.01	1.51	123	3.05	1.23
Locus of causality	54	4.84	0.88	23	4.10	1.20	96	4.38	1.21	60	4.97	0.95	123	4.50	1.07
Continued participation	54	5.10	1.05	23	4.80	1.32	96	5.16	0.93	60	5.35	0.76	123	5.06	0.96
School 4															
Volition	16	5.57	0.37	24	5.21	0.84	27	4.78	0.77	25	4.70	0.90	27	5.01	0.52
Perceived control	16	3.13	1.43	24	3.29	1.31	27	4.00	1.17	25	3.65	1.50	27	3.53	1.05
Locus of causality	16	5.24	0.55	24	5.33	0.70	27	4.82	0.90	25	4.90	1.03	27	5.06	0.60
Continued participation	16	5.57	0.38	24	5.58	0.57	27	5.34	0.57	25	5.20	0.90	27	5.41	0.43

*Note.* 1–1.50 = *Strongly Disagree*, 1.51–2.50 = *Disagree*, 2.51–3.50 = *Slightly Disagree*, 3.51–4.50 = *Slightly Agree*, 4.51–5.50 = *Agree*, and 5.51–6 = *Strongly Agree*.

Table 5

*Students' Self-Perceived Levels of Civic Responsibility (n = 282)*

Civic responsibility construct	Period 1			Period 2			Period 3			Period 4			Total		
	<i>N</i>	<i>M</i>	<i>SD</i>												
School 1															
Connection to the community	58	4.78	0.80	41	4.70	0.76	55	4.45	0.99	58	4.53	0.89	58	4.58	0.77
Community needs awareness	58	4.42	0.81	41	4.30	0.96	55	4.12	1.08	58	4.18	0.89	58	4.20	0.84
Civic efficacy	58	4.27	1.02	41	4.26	1.03	55	4.08	1.11	58	4.24	0.92	58	4.16	0.92
School 2															
Connection to the community	59	4.49	0.93	58	4.15	1.08	59	4.10	1.02	59	4.15	1.11	59	4.22	0.86
Community needs awareness	59	3.79	1.06	58	3.53	1.12	59	3.46	1.02	59	3.62	1.17	59	3.59	0.89
Civic efficacy	59	3.66	1.07	58	3.20	1.24	59	3.34	1.17	59	3.43	1.24	59	3.40	0.96
School 3															
Connection to the community	137	4.61	0.85	121	4.51	0.92	127	4.39	1.01	137	4.46	1.07	137	4.48	0.84
Community needs awareness	137	4.02	0.86	121	3.99	0.99	127	3.96	1.04	137	4.06	1.13	137	3.99	0.88
Civic efficacy	137	3.89	1.01	121	3.85	1.02	127	3.76	1.17	137	3.92	1.21	137	3.84	0.97
School 4															
Connection to the community	27	4.97	0.63	27	4.83	0.91	28	4.83	0.74	28	4.68	1.21	28	4.73	1.00
Community needs awareness	27	4.38	0.65	27	4.49	0.85	28	4.29	0.93	28	4.35	1.26	28	4.29	1.00
Civic efficacy	27	4.20	0.98	27	4.41	1.02	28	4.27	1.26	28	4.44	1.19	28	4.28	1.02

*Note.* 1.50 = *Strongly Disagree*, 1.51–2.50 = *Disagree*, 2.51–3.50 = *Slightly Disagree*, 3.51–4.50 = *Slightly Agree*, 4.51–5.50 = *Agree*, and 5.51–6 = *Strongly Agree*

The second regression model (see Table 7) analyzed the selected predictor variables on students' community needs awareness mean scores. Overall, the second regression model explained 27% of variance (adjusted  $R^2 = .24$ ) in students' community needs awareness mean scores ( $F_{9, 272} = 10.97$ ;  $p \leq .05$ ). The autonomy–locus of causality ( $t = 2.23$ ;  $p = .03$ ) and structured reflection provided ( $t = 2.39$ ;  $p = .02$ ) were found to significantly explain variance in community needs awareness mean scores. The level of participation during Periods 1 through 3 ( $t = 1.50$ ;  $p = .13$ ), level of participation during Period 4 ( $t = 0.91$ ;  $p = .37$ ), time in each civic engagement activity during Periods 1 through 3 ( $t = 0.64$ ;  $p = .53$ ), time in each civic engagement activity during Period 4 ( $t = 1.82$ ;  $p = .07$ ), autonomy–volition ( $t = 1.82$ ;  $p = .07$ ), autonomy–perceived control ( $t = -0.26$ ;  $p = .80$ ), and autonomy–continued participation ( $t = 1.41$ ;  $p = .16$ ) did not explain a statistically significant amount of variance in community needs awareness construct.

Table 7

*Explained Variance in Students' Community Needs Awareness (n = 282)*

Variable	<i>R</i>	<i>R</i> <sup>2</sup>	<i>b</i>	$\beta$	<i>t</i> -value	Sig.
Model	.52	.27				.01*
Level of civic engagement participation						
Periods 1–3			.05	.12	1.50	.13
Period 4 (following reflection)			.07	.06	0.91	.37
Time in each civic engagement activity						
Periods 1–3			.00	.04	0.64	.53
Period 4 (following reflection)			.00	.06	1.08	.28
Autonomy constructs						
Volition			.17	.13	1.82	.07
Perceived control			-.02	-.02	-0.26	.80
Locus of causality			.23	.21	2.23	.03*
Continued participation			.15	.12	1.41	.16
Structured reflection provided			.44	.13	2.39	.02*
(Constant)			.88			

*Note.* Adjusted  $R^2 = .24$ ;  $F(9, 272) = 10.97$ ; \* $p \leq .05$ .

The third regression model (see Table 8) analyzed the selected predictor variables on students' civic efficacy construct mean scores. Overall, the third regression model explained 31% of variance (adjusted  $R^2 = .29$ ) in students' civic efficacy mean scores ( $F_{9, 272} = 13.55$ ;  $p \leq .05$ ). The autonomy–volition ( $t = 2.08$ ;  $p = .04$ ), autonomy–locus of causality ( $t = 3.51$ ;  $p = .01$ ), and structured reflection provided ( $t = 2.10$ ;  $p = .02$ ) were found to significantly explain variance in civic efficacy mean scores. The level of participation during Periods 1 through 3 ( $t = 1.63$ ;  $p = .11$ ), level of participation during Period 4 ( $t = 1.04$ ;  $p = .30$ ), time in each civic engagement activity during Periods 1 through 3 ( $t = 0.65$ ;  $p = .52$ ), time in each civic engagement activity during Period 4 ( $t = 0.95$ ;  $p = .34$ ), autonomy–perceived control ( $t = 0.14$ ;  $p = .89$ ), and autonomy–continued participation ( $t = 0.29$ ;  $p = .77$ ) did not explain a statistically significant amount of variance in civic efficacy construct mean scores.

Table 8

*Explained Variance in Students' Civic Efficacy (n = 282)*

Variable	<i>R</i>	<i>R</i> <sup>2</sup>	<i>b</i>	$\beta$	<i>t</i> -value	Sig.
Model	.56	.31				.01*
Level of civic engagement participation						
Periods 1–3			.06	.12	1.63	.11
Period 4			.08	.07	1.04	.30
Time in each civic engagement activity						
Periods 1–3			.00	.04	0.65	.52
Period 4			.00	.05	0.95	.34
Autonomy constructs						
Volition			.20	.14	2.08	.04*
Perceived control			.01	.01	0.14	.89
Locus of causality			.38	.31	3.51	.01*
Continued participation			.11	.02	0.29	.77
Structured reflection provided			.38	.11	2.10	.04*
(Constant)			.49			

*Note.* Adjusted  $R^2 = .29$ ;  $F(9, 272) = 13.55$ ;  $*p \leq .05$ .

### Conclusions, Implications, and Recommendations

Due to the purposive sampling techniques and the violated normality assumption the findings are limited to the study participants. For Objective 1, we found that nearly all students participated in one or more FFA civic engagement activities, with an average participation of two to seven activities and 20 to 123 total hours of engagement. This conclusion conflicts with existing literature, where less than 60% of all public-school students participate in school-based civic engagement activities (Flanagan, Levine, & Settersten, 2009; National Center for Educational Statistics, 1999; Skinner & Chapman, 1999; Torney-Purta, 2002). It can be implied that constant FFA civic engagement led to higher civic engagement participation levels for more students.

For Objective 2, we concluded that, overall, students in this study had an autonomous experience during FFA civic engagement activities. However, students disagreed on having experienced control or making decisions during FFA civic engagement activities. We further concluded that these activities did not provide students a high degree of perceived control. These conclusions contradict the purpose of the National FFA Organization as a student-led organization (National FFA Organization, 2018) but support previous literature that identified a lack of autonomy within the National FFA Day of Service (Roberts, Terry, Brown, & Ramsey, 2016). Several possible implications can be made from this conclusion. First, perhaps the teachers were not capable of facilitating student control or decision making during FFA civic engagement activities. Some educators may feel uncomfortable relinquishing control to students. Next, there was a high number of students involved in FFA civic engagement activities. An increased number of students could reduce opportunities for individual students to experience

control or decision making during an activity. Finally, perhaps teachers do not realize the developmental importance of allowing students to learn from making decisions.

Overall, students viewed themselves as somewhat responsible for the well-being of their immediate communities. The results regarding students' levels of self-perceived civic responsibility suggest that students possess positive civic attitudes related to civic responsibility; however, youth don't necessarily feel strongly about their roles as responsible community members. It can be implied that room for improvement in civic attitudes exists among this group of students. These students' civic attitudes are positive, but not necessarily strong. Students reported decreasing trends in self-perceived civic responsibility over time. Several implications can be made from this conclusion. First, the decrease in civic responsibility scores could be attributed simply to test wiseness of the subjects in the study. Additionally, a lack of reflection following civic engagement reduces students' civic attitudes. Civic engagement without reflection can be harmful to youths' civic attitudes (Blyth, Saito, & Berkas, 1997).

Analyses indicated that the proportion of variance in each civic responsibility construct can be predicted using a linear combination of involvement level, autonomy, and reflection. Participation level, autonomy, and reflection in FFA civic engagement activities collectively explained a significant portion of students' levels of self-perceived civic responsibility. This conclusion supports existing designs of effective civic education programs (Billig, 2000; Bringle & Hatcher, 1999; Furco & Billig, 2002; Levine & Higgins-D'Alessandro, 2010; Reeve, Bolt, & Cai, 1999; Rose-Krasnor et al., 2006; Yates & Youniss, 1999; Youniss & Yates, 1997). This conclusion provides a unique contribution to the agricultural education profession. No such investigations exist to document effective elements necessary for FFA civic engagement experiences. Frequency of participation was not a significant individual predictor of students' levels of civic responsibility. This conclusion conflicts with existing literature promoting involvement level as a crucial element to civic education (Fiester, Simpkins, & Bouffard, 2005; Rose-Krasnor et al., 2006; Warter & Grossman, 2002). Locus of causality and volition were both found to be significant individual predictors of civic responsibility. Perceived control and continued participation were not found to be significant individual predictors of civic responsibility. This conclusion contradicts the work of scholars who assert all four constructs as crucial elements of autonomous learning environments (Reeve, 2002; Reeve, 2006; Ryan & Deci, 2000). Structured reflection was statistically significant in predicting students' community needs awareness and civic efficacy mean scores. This conclusion supports literature asserting the importance of reflection following civic engagement activities (Bringle & Hatcher, 1999; Camino & Zeldin, 2002; Conway, Amel, & Gerwein, 2009; Stafford, Boyd, & Lindner, 2003; Terry & Bohnenberger, 2004; Youniss & Yates, 1997). The regression models imply that youth leaders and educators should provide a combination of civic engagement opportunities which foster autonomy and include structured reflection.

We recommend that FFA programming should include a variety of civic engagement activities so students can experience a higher level of civic engagement. Civic engagement activities are more impactful when the activity is internally important to the student. To support student autonomy, educators should allow as many students as possible to experience control or decision-making responsibilities during civic engagement. We recommend that researchers further investigate the types of civic engagement activities utilized within FFA programming and the impact of various activities on civic responsibility. Studies should be conducted to investigate catalysts that support autonomy both within civic engagement and other areas of FFA

programming. Researchers should also study the effectiveness of various post-activity reflection approaches on students' civic responsibility.

### References

- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education*. Belmont, CA: Wadsworth Cengage Learning.
- Balsano, A. D. (2005). Youth civic engagement in the United States: Understanding and addressing the impact of social impediments on positive youth and community development. *Applied Developmental Science, 9*(4), 188–201. doi:10.1207/s1532480xads0904\_2
- Billig, S. H. (2000). Research on K-12 school-based service-learning: The evidence builds. *Phi Delta Kappan, 81*(9), 658–664.
- Blyth, D. A., Saito, R., & Berkas, T. (1997). A quantitative study of the impact of service-learning programs. In A. S. Waterman (Ed.), *Service-learning: Applications from the research* (pp. 39–56). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Brandell, M. E., & Hinck, S. (2005). Service learning: Connecting citizenship with the classroom. *Journal of Service Learning, 81*(591), 49–56. doi:10.1177/019263659708159109
- Bradley, L. R. (1997). Evaluating service-learning: Toward a new paradigm. In A. S. Waterman (Ed.), *Service-learning: Applications from the research* (pp. 151–172). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Bringle, R. G., & Hatcher, J. A. (1999). Reflection in service learning: Making meaning of experience. *Educational Horizons, 77*, 179–185.
- Busseri, M. A., Rose-Krasnor, L., Willoughby, T., & Chalmers, H. (2006). A longitudinal examination of breadth and intensity of youth activity involvement and successful development. *Developmental Psychology, 42*(6), 1313–1326. doi:10.1037/0012-1649.42.6.1313
- Caspersz, D. & Olaru, D. (2017). The value of service-learning: the student perspective, *Studies in Higher Education, 42*(4), 685–700. doi: 10.1080/03075079.2015.1070818
- Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *Annals of the American Academy of Political and Social Science, 591*(1), 98–124. Retrieved from <http://www.jstor.org/stable/4127638>
- Camino, L., & Zeldin, S. (2002). From periphery to center: Pathways for youth civic engagement in the day-to-day life of communities. *Applied Developmental Science, 6*(4), 212–219. doi:10.1207/S1532480XADS0604\_8
- Conway, J. M., Amel, E. L., & Gerwein, D. P. (2009). Teaching and learning in the social context: A meta-analysis of service learning effects on academic, personal, social, and citizenship outcomes. *Teaching of Psychology, 36*(4), 233–245. doi:10.1080/00986280903172969

- Dewey, J. (1933). *How we think*. Boston, Massachusetts: D. C. Heath & Company Publishers.
- Evans, S., & Prilleltensky, I. (2005). Youth civic engagement. In M. Ungar (Ed.), *Handbook of working with children and youth: Pathways to resilience across cultures and contexts* (pp. 405–415). Thousand Oaks, CA: Sage Publications.
- Eyler, J., Giles, D. E., & Braxton, J. (1995). The impact of alternative models of service-learning on student outcomes. Paper presented at the meeting of the National Society for Experiential Education, New Orleans, LA.
- Field, A. (2009). *Discovering statistics using SPSS*, third edition. Thousand Oaks, CA: SAGE Publications
- Fiester, L. M., Simpkins, S. D., & Bouffard, S. M. (2005). Present and accounted for: Measuring attendance in out-of-school-time programs. *New Directions for Youth Development*, 2005(105), 91–107. doi:10.1002/yd.109
- Finlay, A., Wray-Lake, L., & Flanagan, C. A. (2010). Civic engagement during the transition to adulthood: Developmental opportunities and social policies at a critical juncture. In L. R. Sherrod, J. Torney-Purta, & C. A. Flanagan (Eds.), *Handbook of research on civic engagement in youth* (pp. 277–306). Hoboken, NJ: John Wiley & Sons, Inc.
- Flanagan, C., & Faison, N. (2001). Youth civic development: Implications of research for social policy and programs. *Social Policy Report*, 15(1), 3–15.
- Flanagan, C., Levine, P., & Settersten, R. (2009). *Civic engagement and the changing transition to adulthood*. Medford, MA: CIRCLE.
- Furco, A., & Billig, S. H. (2002). *Service-learning: The essences of the pedagogy*. Greenwich, CT: Information Age Publishing.
- Furco, A., Jones-White D., Huesman R., Gorny L. (2016) Modeling the influence of service-learning on academic and sociocultural gains: Findings from a multi-institutional study. In K. Soria & T. Mitchell (Eds.) *Civic engagement and community service at research universities*. Palgrave Studies in Global Citizenship Education and Democracy (pp. 143–163). Palgrave Macmillan, London. doi: [https://doi.org/10.1057/978-1-137-55312-6\\_8](https://doi.org/10.1057/978-1-137-55312-6_8)
- Furco, A., Muller, P., & Ammons, M. (1998). *Pre-post civic responsibility survey*. Berkeley, California: Service Learning Research and Development Center.
- Giles, D. E., & Eyler, J. (1994). The impact of a college community service laboratory on students' personal, social, and cognitive outcomes. *Journal of Adolescence*, 17(4), 327–339. doi:10.1006/jado.1994.1030
- Greene, D., & Diehm, G. (1995). Educational and service outcomes of a service integration effort. *Michigan Journal of Community Service Learning*, 2, 54–62.
- Hancock, D., Dyk, P. H., & Jones, K. (2012). Adolescent involvement in extracurricular activities: Influences on leadership skills. *Journal of Leadership Education* 11(1), 84–101.

- Hart, D., & Atkins, R. (2002). Civic competence in urban youth. *Applied Developmental Science, 6*(4), 227–236. doi:10.1207/S1532480XADS0604\_10
- Horstmeier, R. P. & Ricketts, K. G. (2009). Youth leadership development through school-based civic engagement activities: A case study. *Journal of Leadership Education, 8*(2), 238–252. Retrieved from [http://bigcat.fhsu.edu/jole/issues/JOLE\\_8\\_2.pdf#page=251](http://bigcat.fhsu.edu/jole/issues/JOLE_8_2.pdf#page=251)
- Jacobsen, R. & Casalaspí, D. (2016). If someone asked, I'd participate: Teachers as recruiters for political and civic participation. *Journal of Adolescent Research, 33*(2), 153–186. doi: 10.1177/0743558416674813
- Langston, S. (1987). Strengthening citizen participation. *National Civic Review, 76*(1), 225–226. doi: <http://dx.doi.org/10.1017/S1537592708080584>
- Lerner, R. (2017). *Liberty: Thriving and civic engagement among America's youth*. Thousand Oaks, CA: SAGE Publications.
- Levine, P., & Higgins-D'Alessandro, A. (2010). Youth civic engagement: Normative issues. In L. R. Sherrod, J. Torney-Purta, & C. A. Flanagan (Eds.), *Handbook of research on civic engagement in youth* (pp. 115–138). Hoboken, NJ: John Wiley & Sons, Inc.
- Lin, A. (2015). *Citizenship education in American schools and its role in developing civic engagement: A review of the research*. *Educational Review, 67*(1), 35–63. doi: <http://dx.doi.org/10.1080/00131911.2013.813440>
- McGuire, J. K., & Brown, M. (2015). Types and conditions of service learning. In J. Field, B. Schmidt-Hertah, & A. Waxenegger (Eds.), *Universities and engagement: International perspectives on higher education and lifelong learning* (pp. 117–129). New York, NY: Routledge, Taylor, & Francis Group.
- McIntosh, H., Metz, E., & Youniss, J. (2005). Community service and identity formation in adolescents. In J. Mahoney, R. Larson, & J. Eccles (Eds.), *Organized activities as contexts of development: Extracurricular activities, after-school, and community programs* (pp. 331–351). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Mondak, J. J., & Gearing, A. F. (1998). Civic engagement in a post-communist state. *Political Psychology, 19*(3), 615–637. doi:10.1111/0162-895X.00121
- National Center for Educational Statistics. (1999). *The condition of education* [Data file]/ Retrieved from <http://nces.ed.gov/annuals/>
- National FFA Organization. (2018). Living to serve. Retrieved from <https://www.ffa.org/livingtoserve/>.
- Nunnally, J. C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.
- Oliver, J. D., & Hinkle, D. E. (1982). Occupational education research: Selecting statistical procedures. *Journal of Studies in Technical Careers, 4*(3), 199–207.
- Parker, E. A., Myers, N., Higgins, H. C., Oddsson, T., Price, M., & Gould, T. (2009). More than experiential learning: A case study of community service learning within the Australian

- context. *High Education Research and Development*, 28(6), 585–596.  
doi:10.1080/07294360903161147
- Pearce, N., Walker, K., & Larson, R. (2005). A comparison of youth-driven and adult-driven programs: Balancing inputs from youth and adults. *Journal of Community Psychology*, 33(1), 57–74. doi:10.1002/jcop.20035
- Reeve, J. (2002). Self-determination applied to educational settings. In R. Ryan & E. Deci (Eds.), *Handbook of self-determination research* (pp. 3-36). Rochester, NY: University of Rochester Press.
- Reeve, J. (2006). What teachers say and do to support students' autonomy during a learning activity. *Journal of Educational Psychology*, 98(1), 209–218. doi:10.1037/0022-0663.98.1.209
- Reeve, J., Bolt, E., & Cai, Y. (1999). Autonomy-supportive teachers: How they teach and motivate students. *Journal of Educational Psychology*, 91(3), 537.
- Ricketts, C., & Ricketts, J. C. (2011). *Leadership: Personal growth and career success*. Clifton Park, NY: Delmar.
- Roberts, R., Terry Jr, R., Brown, N. R., & Ramsey, J. W. (2016). Students' Motivations, Value, and Decision to Participate in Service-Learning at the National FFA Days of Service. *Journal of Agricultural Education*, 57(2), 187–202.
- Rose-Krasnor, L., Busseri, M. A., Wiloughby, T., & Chalmers, H. (2006). Breadth and intensity of youth involvement as contexts for positive development. *Journal of Youth and Adolescence*, 35(3), 385–499. doi:10.1007/s10964-006-9037-6
- Ryan, R. M., & Deci, E. L. (2000). *When awards compete with nature: The undermining of intrinsic motivation and self-regulation*. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 13–54). San Diego, CA: Academic Press.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin Company.
- Skinner, R., & Chapman, C. (1999). *National student service-learning and community service survey*. Washington, DC: U.S. Department of Education.
- Stafford, J. R., Boyd, B. L., & Lindner, J. R. (2003). The effects of service learning on leadership life skills of 4-H members. *Journal of Agricultural Education*, 44(1), 10–21.  
doi:10.5032/jae.2003.01010
- Terry, A. W., & Bohnenberger, J. E. (2004). Blueprint for incorporating service learning: A basic, developmental, K-12 service learning typology. *Journal of Experiential Education*, 27(1), 15–31.
- Torney-Purta, J. (2002). The school's role in developing civic engagement: A study of adolescents in twenty-eight countries. *Applied Developmental Science*, 6(4), 203–212.  
doi:10.1207/S1532480XADS0604\_7

- Vézina, M. & Poulin, F. (2017). Investigating civic participation developmental trajectories among Canadian youths transitioning into adulthood. *Applied Developmental Science, 1*(1), 1–15. doi: 10.1080/10888691.2017.1301816
- Vialle, W., Lysaght, P. & Verenikina, I. (2000). *Handbook on child development*. Katoomba, NSW: Social Science Press.
- Warter, E. H., & Grossman, J. M. (2002). An application of developmental-contextualism to service-learning. In A. Furco & S. H. Billig (Eds.), *Service-learning: The essences of the pedagogy* (pp. 83–102). Greenwich, CT: Information Age Publishing.
- Waterman, A. S. (1997). An overview of service-learning and the role of research and evaluation in service-learning programs. In A. S. Waterman (Ed.), *Service-learning: Applications from the research* (pp. 39–56). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Wikenfeld, B., Lauckhardt, J., & Torney-Purta, J. (2010). The relationship between developmental theory and measures of civic engagement in research on adolescents. In L. R. Sherrod, J. Torney-Purta, & C. A. Flanagan (Eds.), *Handbook of research on civic engagement in youth* (pp. 193–220). Hoboken, NJ: John Wiley & Sons, Inc.
- Yates, M., & Youniss, J. (1999). Promoting identity development: Ten ideas for school-based service programs. In J. Claus & C. Ogden (Eds.), *Service learning for youth empowerment and social change* (pp. 43–68). New York, NY: Peter Lang Publishing, Inc.
- Youniss, J. & Yates, M. (1997). *Community service and social responsibility in youth: Theory and policy*. Chicago, IL: University of Chicago Press.

## **Discussant Remarks**

### **Factors Impacting Civic Responsibility Development During FFA Civic Engagement Activities**

Discussant: Leslie D. Edgar, University of Georgia

#### **Summary of Article**

This manuscript addresses a significant issue related to civic responsibility and engagement in FFA. I want to commend the authors on their research design and contributions to the agricultural education profession. The conceptual framework, created by the authors, of this article was based on the three dimensions of civic responsibility: “connection to the community, awareness of existing community needs, and civic efficacy.” The conceptual model, using existing youth development and civic engagement literature, should serve as a guide for other researchers interested in this space. The methods consisted of a quasi-experimental, nonequivalent control group pretest-posttest design and were detailed, save the state where the research occurred. The conclusions provide insight in to explained variables in students’ community needs awareness and civic efficacy for determining self-perceived FFA civic engagement and responsibility. The article may have been more impactful if specific examples of each of the autonomy constructs were provided to help the reader better consider the “so what” of integrating civic responsibilities into FFA civic engagement activities.

#### **Selected Questions for Discussion and Further Research or Future Practice**

- 1) As noted in your article, “civic attitudes will not significantly change unless youth are presented with long-term exposure of civic problems.” What are some examples of these types of programs/activities that currently occur in FFA programs?
- 2) As a part of this study, you posed that students should have more autonomy in decision-making responsibilities (specifically in control and decision making) during civic engagement. What are some examples of these possibilities?
- 3) As agricultural education teacher educators, how should courses/education be adjusted to include increased understanding in the developmental importance of allowing students to learn from making decisions?
- 4) What training should occur for current teachers regarding how to offer/expand FFA civic engagement activities?
- 5) As a discipline and within limited/reduced hours, how do we prepare our students (future agriculture teachers) with the competencies they will need to be successful teachers that encourage civic engagement?

# Benefits of Using Service-Learning in the Preparation of Teachers: An Analysis of Agricultural Education Teacher Educators' Beliefs and Intentions

Richie Roberts, *Louisiana State University*  
M. Craig Edwards, *Oklahoma State University*  
J. Shane Robinson, *Oklahoma State University*

## Abstract

*In the 1990s, higher education institutions began to dedicate substantial resources to support the integration of service-learning (SL) in courses across university campuses. However, a dearth in the knowledge base endures in regard to understanding how faculty members', and especially agricultural education teacher educators', underlying beliefs about the benefits of SL may influence their intentions and associated planned behaviors. Therefore, this study sought to understand the behavioral beliefs and intentions of agricultural education teacher educators regarding their use of SL as a method of instruction. To accomplish this, we used descriptive statistics to describe results derived from measures of relationships among the variables of interest. Overall, the teacher educators perceived that SL could provide benefits to classrooms and communities. Findings also revealed statistically significant relationships ( $p < .05$ ) among the dependent variables and participants' prior SL experiences. Despite reporting positive beliefs about the method, participants generally indicated they did not intend to use or highlight SL in their teaching methods courses. Future research should explore the chasm that exists between teacher educators' beliefs and their intentions to use the method in the preparation of agricultural education teachers.*

## Introduction

At the close of the 20th century, the Kellogg Commission on the Future of State and Land-Grant Universities (1999) released *Returning to Our Roots*; a report that called for higher educational institutions to begin to reemphasize *engagement, community partner-building, and practical educational experiences*. As the report gained national attention, many faculty members in higher education *chose to* implement service-learning (SL) to address the principles outlined by the Kellogg Commission (Speck & Hoppe, 2004). It is important to note that faculty members who decided to invest in SL meant a fundamental pedagogical change occurred at individual levels, and preceded the method diffusing more broadly and becoming routinized over time at their respective institutions (Vogel, Seifer, & Gelmon, 2010). Thereafter, the popularity of SL grew immensely across many university campuses. However, confusion remains in regard to its meaning. For instance, *community service* and *SL* are frequently used interchangeably and overlap considerably in the literature. Despite sharing an element of volunteerism, SL scholars (Giles & Eyler, 1994; Eyler, 2002) have argued the two practices should be understood independently. In differentiating between the terms, *community service* is often conceptualized as a voluntary act and independent of coursework or related learning assignments (Astin & Sax, 1998; Astin, Sax, & Avalos, 1999). In contrast, SL is integrated into the curriculum and seeks to foster academic achievement while also generating greater social and cultural understanding through student reflection and subsequent actions (Crews, 2002).

From university students' perspectives, courses that involve a SL element have a number of unique benefits. Those benefits include (a) opportunities to apply learning to a real-world setting, (b) deeper relationships with instructors, (c) opportunities for personal growth and development, and (d) a heightened sense of social and civic responsibility (Eyler & Giles, 1999; Eyler, Giles, Stenson, & Gray, 2001). Although numerous higher education institutions had woven *civic engagement* and *service* into the framework of their missions, Wade and Demb (2009) theorized faculty members' beliefs about the perceived benefits and barriers associated with using SL could be categorized as one of three factors: (a) institutional, (b) professional, or (c) personal.

In the 1990s, higher education *institutions* began to dedicate substantial amounts of resources to support the integration of SL into their courses (Butin, 2010; Hinck & Brandell, 2000). To guide administrators and other decision-makers in this process, scholars (Abes, Jackson, & Jones, 2002; Antonio, Astin, & Cress, 2000; Vogel et al., 2010) articulated the *role of SL support offices and their importance* in assisting faculty with incorporating the method so student learning and university-community partnerships could be enriched. Bringle and Hatcher (1996) also provided case examples to assist universities in (a) providing training and professional development for SL, (b) developing SL mentorship programs, and (c) publicizing faculty members' SL successes. The manifestation of these institutional changes positively influenced faculty members' use of SL at some schools (Abes et al., 2002).

Another area of particular emphasis portrayed throughout the SL literature is the role of faculty members' *professional factors* such as their academic ranks – a variable yielding mixed results. In particular, some studies reported faculty members in lower ranking positions were more predisposed to using SL as an instructional approach (Abes et al., 2002; Banerjee & Hausafus, 2007); however, other investigators (Furco & Moely, 2012; Russell-Stamp, 2015) indicated non-statistically significant relationships regarding this professional attribute. One reason for this inconsistency was that an interaction existed between faculty members' professional characteristics and perceptions of impediments to using the method, such as the *time commitment* needed to produce high-quality SL experiences (Abes et al., 2002). For instance, Abes et al. (2002) reported that faculty members at research-focused institutions often articulated they found it difficult to balance their professional roles when using time-consuming instructional methods. And because service is often the least rewarded aspect of the tenure process, many faculty members viewed SL as a *distraction* (Banerjee & Hausafus, 2007). In addition, these perceived barriers negatively influenced the likelihood of faculty members pursuing resources for SL (Kezar, 2013), a notion also connected to their *unique personal characteristics*.

To identify the personal characteristics of faculty members more likely to implement SL in their courses, McKay and Rozee (2004) conducted in-depth interviews. Using Rogers' (2003) diffusion of innovations theory, they found faculty members were more likely to implement SL if they viewed it as complementary or *compatible* with their teaching philosophies. Moreover, the instructors perceived SL offered unique benefits to their classrooms as well as to the local community (McKay & Rozee, 2004), i.e., it held *relative advantage* (Rogers, 2003) over other teaching methods. Building on these findings, Pribbenow (2005) explored the impacts SL had on faculty members and found they expressed having more meaningful teaching experiences, deeper

relationships with students, and that students had higher academic achievement. These findings have fueled calls for teacher educators to purposefully integrate SL into their courses while also outlining the use of SL as a pedagogy for preservice teachers – a notion also emphasized by recent literature in agricultural education (Roberts & Edwards, 2015, 2018; Roberts, Edwards, & Ivey, 2018; Roberts, Edwards, & Robinson, 2018; Roberts, Terry, Brown, & Ramsey, 2016). Existing empirical evidence demonstrates that SL may improve the perceived *career readiness* of teacher candidates (Anderson, 2000; Meaney, Griffin, & Bohler, 2009). However, teacher educators of agricultural education perceive that deterrents exist at the classroom level, which influences their intentions to use the method in teacher preparation programs (Roberts, Edwards, & Robinson, 2018). In addition to classroom barriers, agricultural education teacher educators also articulated that lack of understanding, restrictive teacher credentialing policies, and time constraints were obstacles to implementing the method (Roberts, Edwards, & Ivey, 2018). We now comprehend better the factors that discourage SL's adoption in agricultural education. However, a dearth in the knowledge base endures in regard to understanding how agricultural education teacher educators' underlying beliefs about the benefits of SL may influence their intentions and associated planned behaviors (Ajzen, 1991).

### **Theoretical/Conceptual Framework**

Such deficiencies in the literature reflect the complicated space occupied by SL in teacher education. In the current study, Ajzen's (1991, 2002) theory of planned behavior (TPB) was employed as a basis for investigating the beliefs and intentions expressed by teacher educators of agricultural education regarding SL as an instructional method for them *and* their preservice students. TPB lies at the intersection of work regarding individuals' beliefs, decision-making behaviors, and motivations (Ajzen, 1991). Through the lens of TPB, Ajzen (2006) posited that behaviors are the product of an individual's underlying beliefs and intentions. Ajzen (1991) also theorized that beliefs are understood best by viewing them through three distinct lenses: (1) behavioral, (2) normative, and (3) control. Behavioral beliefs reflect the attitudes an individual exhibits regarding a behavior, whether positive or negative (Ajzen & Fishbein, 1980). Meanwhile, normative beliefs refer to the level of social pressure an individual perceives (Ajzen, 1991, 2006). Finally, control beliefs represent the level of difficulty an individual perceives is involved with actualizing a specific behavior. Ajzen (1991) maintained such beliefs foreground the intentions an individual holds about future actions. TPB has been used to analyze a range of planned behaviors such as college retention (Sutter & Paulson, 2017), environmental consciousness (DeLeeuw, Valois, Ajzen, & Schmidt, 2005), and instructional practices (Kumar, Karabenick, & Burgoon, 2015), among others.

For this study, we examined the behavioral beliefs of teacher educators of agricultural education concerning SL by using the Web-based Faculty SL Beliefs Inventory [wFSLBI] (Hou, 2010). Their intentions were assessed by collecting participants' course syllabi and analyzing such using Gelmon et al. (2001) Service-Learning Syllabus Analysis Guide (SLSAG). It should be noted that existing SL literature was also important in shaping the conceptual basis of this study. For instance, through previous research on faculty members' SL beliefs, we identified six variables, i.e., the external variables for this study, which influence the planned behaviors of faculty members (Abes et al., 2002; Banerjee & Hausafus, 2007; Barth, Bent, Fischer, Richter, & Rieckmann, 2014; Bringle & Hatcher, 1996; Bulot & Johnson, 2006; Butin, 2006; Colbeck & Wharton-Michael, 2006; Conway, Amel, & Gerwien, 2009; Cooper, 2014; Hou, 2010; Hou &

Wilder, 2015). The variables include faculty members (a) SL experience, (b) gender, (c) age, (d) education, (e) tenure/rank, and (f) institution type. Based on Ajzen’s (1991) TPB and the identified external variables, a conceptual model (see Figure 1) was developed to guide this investigation. The conceptual framework is comprised of the six external variables as well as four factors consistent with the TPB (Ajzen, 1991).

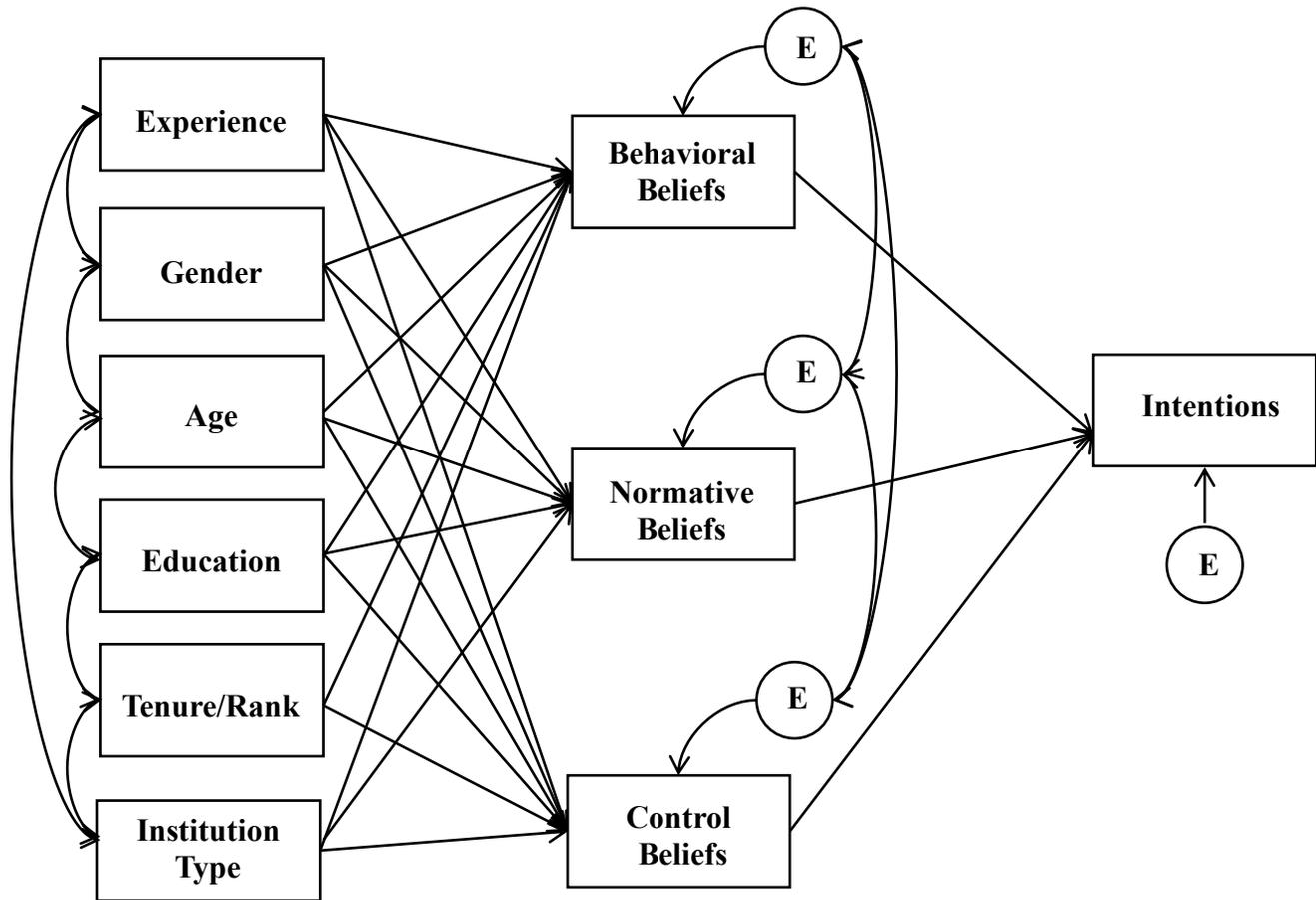


Figure 1. The conceptual framework for this study as derived from Ajzen’s (1991) theory of planned behavior and related SL literature. Note. “E” represents the study’s external variables in regard to influencing the beliefs of agricultural education teacher educators.

### Purpose and Objectives

Our investigation sought to describe the *behavioral beliefs* and *intentions* of teacher educators of agricultural education. This manuscript features one aspect of a larger investigation. The participants’ *normative* and *control* beliefs were reported in a separate work (Roberts, Edwards, & Robinson, 2018). Because this study was positioned to examine teacher educators’ views about a method of instruction, i.e., SL, which could be used to assist in building the capacity of communities, it addressed the American Association for Agricultural Education’s Research Priority Area 6: *Vibrant, Resilient Communities* (Graham, Arnold, & Jayaratne, 2016).

Three research objectives guided the study: 1. Describe agricultural education teacher educators' *behavioral beliefs*; 2. describe agricultural education teacher educators' *intentions* in regard to using SL as a method of instruction; and 3. describe the relationships among agricultural education teacher educators' *behavioral beliefs*, *intentions*, and the study's *external variables*.

## Methods and Procedures

We conducted a national census of agricultural education teacher educators' *behavioral beliefs* and *intentions* regarding SL's use as a method of instruction. To accomplish such, the American Association for Agricultural Education's (AAAE's) membership directory provided the study's respondent frame. In addition, we employed Dillman's, Smyth's, and Christian's (2014) tailored design method to collect data using a web-based instrument, which was created using Qualtrics™ online software and administered through AAAE's electronic mail listserv. The agricultural education teacher educators were also requested to upload a course syllabus to the web-based instrument or transmit it to the lead researcher by electronic mail to assess their *intentions* about using SL as a method of instruction.

## Data Collection and the Population

More than 80 higher education institutions in the United States prepare school-based, agricultural education (SBAE) instructors (Birkenholz & Simonsen, 2011; Kantrovich, 2010). To ensure the population of interest was identified, we requested that participants indicate if they "taught at least one agricultural education teaching methods course during the three previous academic years or would do such in the spring academic term of 2017" (Roberts, 2017). The responses to this item were used as a sorting variable to determine whether their participation should end or if the teacher educators should complete the instrument. Using this procedure, we identified 46 (59%) usable responses from 43 institutions across the United States. Of note, 31 responses were disregarded from analysis because they did not meet one or more of the following criteria: (1) completion of the instrument, (2) submission of a course syllabus, or (3) the relevant contact information required to link data, as warranted by the larger study, was not provided. In accord with Dillman et al. (2014) tailored survey design, we sent a pre-notice message as well as a formal invitation and three reminders at timed intervals to maximize participation in the study.

Agricultural education teacher educators exhibited a variety of personal, professional, and institutional characteristics, but similarities among participants were also reported. For example, the population was composed of 33 males (71.7%) and 13 females (28.3%) with a(n) racial/ethnic composition of 97.8% White ( $f = 45$ ) and 2.2% African American ( $f = 1$ ). A wide range of diversity, however, was reported in regard to participants' ages, which ranged from 29 to 71 years old. Slightly more than one-third of the teacher educators were 31 to 40 years old ( $f = 17$ ) and 13 (28.3%) ranged from 41 to 50. Participants represented 26 states. Of all states, 15.2% ( $f = 7$ ) of the respondents were from Texas; meanwhile, Kentucky, North Carolina, Oklahoma, and Tennessee had three representatives or 6.5% each. When asked about their professional characteristics, 97.8% ( $f = 45$ ) indicated they had earned doctoral degrees and 22 (47.8%) held the rank of assistant professor. More than 40% ( $f = 20$ ) were either associate professors or professors. Moreover, nearly one-half ( $f = 22$ ) were tenured, and 18 (39.1%) reported navigating the tenure track. To gain deeper insight regarding the teacher educators' institutional factors, the participants were asked whether their universities were land-grant institutions and ranking on the

Carnegie Classification for Higher Education Institutions. Of the 46 participants, 31(67.4%) specified they were employed by a land-grant institution, and 15 (32.6%) were not. Regarding their Carnegie Classification, 58.7% ( $f = 27$ ) of the participants indicated they worked at a Research 1 Institution, and 26% ( $f = 12$ ) were employed at doctoral-granting institutions classified as either Research 2 or Research 3.

In the literature (Abes et al., 2002; Hou, 2010; Russell-Stamp, 2015), experience has been noted as a variable that influences university faculty members' SL beliefs. As such, this variable was examined at three different levels: (a) teaching experience, (b) experience as a student at the postsecondary level, and (c) experience as a student at the secondary level. In the current study, more than 50% ( $f = 26$ ) of the teacher educators indicated they had taught using SL as a method of instruction; the other participants had not. On the other hand, 31 participants or more than two-thirds (67.4%) did not experience SL as a student at the postsecondary level; however, almost one-third ( $f = 15$ ) had. Personal experience was more scant at the secondary level with 76.1% ( $f = 35$ ) of the participants reporting no SL experience at that point in their schooling.

### **Instrumentation and Analysis of Data**

The web-based instrument used in this study consisted of two major sections: (1) items modified slightly from Hou's (2010) wFSLBI, and (2) items designed to collect the participants' personal, professional, and institutional characteristics. Further, teacher educators submitted course syllabi through Qualtrics™ or by electronic mail, which were assessed by three external raters using Gelmon et al. (2001) SLSAG. Hou (2010) created the wFSLBI as a way to more intimately understand faculty members' SL beliefs through the lens of Ajzen's (1991) TPB. Using factor analysis procedures, Hou (2010) confirmed four unique factors: (1) perceived benefits at the classroom level (PROS\_CLS), (2) perceived benefits at the community level (PROS\_COM), (3) perceived barriers at the institutional level (CONS\_INST), and (4) perceived barriers at the classroom level (CONS\_CLS). Based on Hou's (2010) recommendations, PROS\_CLS and PROS\_COM were conceptualized as participants' *behavioral beliefs*. Findings related to the other two subscales, CONS\_INST and CONS\_CLS have been previously reported (see Roberts, Edwards, & Robinson, 2018). Through instrument validation procedures, Hou (2010) indicated that all four subscales of the wFSLBI yielded satisfactory reliability estimates. In accord, post hoc reliability estimates demonstrated that each of the subscale's produced Cronbach's alphas of .71 or larger and, thus, were considered acceptable (Field, 2013). On the web-based instrument, we presented the wFSLBI on a five-point, Likert-type scale to determine level of agreement: 1 = *Strongly agree*, 2 = *Agree*, 3 = *Neutral*, 4 = *Disagree*, and 5 = *Strongly disagree* (Hou, 2010).

We also inquired about the participants' personal, professional, and institutional characteristics, as reported above. The variables in this section were primarily categorical and dichotomous. The participants' syllabi were used to examine their *intentions* to use SL as a method of instruction, which was assessed using Gelmon et al. (2001) SLSAG. The SLSAG was developed to evaluate faculty members' intentions to integrate SL into their courses using 10 quality indicators. In this study, we slightly modified the instrument's items to more closely reflect the context of agricultural education. The lead researcher recruited two external raters to assist in scoring syllabi and assigning *intention* scores (Bornmann, Mutz, & Daniel, 2010). To improve interrater reliability, the lead researcher provided a training session for the two external raters to explain best practices associated with using the SLSAG. During this session, raters

practiced by scoring a randomly selected syllabus as well as discussed and negotiated their discrepancies to enhance reliability. When scoring syllabi, raters followed Gelmon et al. (2001) recommendations by which syllabi were analyzed using the 10 quality indicators of SL. A score was assigned on each indicator as described by the SLSAG; “1” if present and “0” if not. To determine interrater reliability, we analyzed raters scores using intraclass correlation coefficients (ICCs) (Shrout & Fleiss, 1979), which resulted in a *satisfactory* ICC of .88.

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20 for Macintosh computers. For research objectives one and two, findings are reported using descriptive statistics, including percentages and measures of central tendency, such as means and standard deviations. Regarding research objective three, we conducted bivariate correlational analysis to describe relationships (Gay, Mills, & Airasian, 2012) among teacher educators’ behavioral beliefs, intentions, and the study’s external variables. Due to the range of variables (categorical, dichotomous, and ordinal) tested, point bi-serial and Spearman’s Rho bivariate correlational analyses were employed. To report the magnitude of the correlation coefficients, Davis’ conventions (as cited in Miller, 1994) were used:  $0.1 \geq r \geq .09 = \textit{Negligible}$ ;  $.10 \geq r \geq .29 = \textit{Low}$ ;  $.30 \geq r \geq .49 = \textit{Moderate}$ ;  $.50 \geq r \geq .69 = \textit{Substantial}$ ; and  $.70 \geq r \geq .99 = \textit{Very High}$ .

## Findings

Research objective one sought to describe agricultural education teacher educators’ *behavioral beliefs*. For this study, behavioral beliefs were measured through benefits to the classroom (PROS\_CLS) and benefits to the community (PROS\_COMM) subscales on the wFSLBI. Both were assessed on a Likert-type scale ranging from 1 = *Strongly Agree* to 5 = *Strongly Disagree* and positively worded. The PROS\_CLS subscale was composed of seven items. For the purpose of interpretation, the real limits of the subscales were 1.00 to 1.49 = *Strongly agree*, 1.50 to 2.49 = *Agree*, 2.50 to 3.49 = *Neutral*, 3.50 to 4.49 = *Disagree*, and 4.50 to 5.00 = *Strongly disagree*. For the PROS\_CLS items, the subscale produced an overall mean score of 2.08 ( $SD = .527$ ) or *agree* that benefits existed to using SL at the classroom level. Table 1 presents the individual items for the PROS\_CLS subscale and response percentages for each corresponding item.

Table 1

*Item Response Percentages for the PROS\_CLS Subscale of the wFSLBI*

Item	1	2	3	4	5
Service-learning enriches classroom discussions and lectures in my courses.	52.2%	43.5%	4.3%	0.0%	0.0%
I enjoy teaching more when the class involves service learning.	15.2%	50.0%	32.6%	0.0%	2.2%
Service-learning helped me to understand my professional strengths and weaknesses.	23.9%	37.0%	32.6%	6.5%	0.0%

Item	1	2	3	4	5
Using service-learning helped me clarify areas of focus for my scholarship.	10.9%	32.6%	32.6%	21.7%	2.2%
Using service-learning in courses has resulted in a change in my teaching style(s).	23.9%	54.3%	21.7%	0.0%	0.0%
Using service-learning is an important component of my professional portfolio.	26.1%	43.5%	28.3%	2.2%	0.0%
I was able to develop a good relationship with the students in my service-learning course(s) because of the community work.	37.0%	43.5%	17.4%	2.2%	0.0%

*Note.* 1 = *Strongly agree*; 2 = *Agree*; 3 = *Neutral*; 4 = *Disagree*; and 5 = *Strongly disagree*

The PROS\_COMM subscale, comprised of six items, was used to assess participants' behavioral beliefs regarding SL's benefits to the community. Overall, participants reported agreement ( $M = 1.74$ ;  $SD = .469$ ) with items on the PROS\_COMM subscale. Table 2 presents the individual items for the PROS\_COMM subscale and response percentages for corresponding items.

Table 2

*Item Response Percentages for the PROS\_COMM Subscale of the wFSLBI*

Item	1	2	3	4	5
The service my students completed was beneficial to the community.	45.7%	41.3%	13.0%	0.0%	0.0%
I value working with community partners to structure and deliver the service-learning experience for students.	30.4%	52.2%	15.2%	2.2%	0.0%
I learned something new about the community from my community partners.	63.0%	28.3%	8.7%	0.0%	0.0%
The community members with whom I partner play an active role in the planning or development of my service-learning course(s).	37.0%	30.4%	30.4%	2.2%	0.0%
The work my students and I performed enhanced my ability to communicate my ideas in the community.	26.1%	52.2%	21.7%	0.0%	0.0%

Item	1	2	3	4	5
I can make a difference in the community.	56.5%	39.1%	4.3%	0.0%	0.0%

*Note.* 1 = *Strongly agree*; 2 = *Agree*; 3 = *Neutral*; 4 = *Disagree*; and 5 = *Strongly disagree*

For research objective two, three external raters evaluated the participants' course syllabi on 10 quality indicators of SL using Gelmon et al. (2001) SLSAG. The raters assigned "0" if an element was not present in a syllabus and "1" if it was found. Thereafter, raters' item selections were examined through composite means and standard deviations to allow for direct comparison of the SLSAG items. The item "time dedicated to outlining the use of service-learning as an instructional method" emerged as the most frequently identified criterion ( $M = 4.00$ ;  $SD = .266$ ) by the raters. However, items "course objectives that are directly related to the teaching and learning of service-learning as an instructional method" and "course objectives that identify teaching the *philosophy* of service-learning as an instructional method" were not identified by the raters for any of the 46 syllabi assessed. To evaluate participants' intention scores, the SLSAG items were summed and averaged across raters. The following quality standards were used to interpret the scores: 0 = *Nonexistent*; 1 to 2 = *Poor*; 3 to 5 = *Fair*; 6 to 7 = *Strong*; 7 to 9 = *Excellent*; 10 = *Outstanding* (Gelmon et al., 2001). As such, one participant's course syllabus received a rating of *fair*, 18 received a *poor* rating, and 27 of the syllabi did not have any SL elements present. Using this procedure, we calculated the composite mean of the agricultural education teacher educators' intentions, which resulted in a score of 0.70 ( $SD = .846$ ). Therefore, the teacher educators' intentions to use SL were largely *nonexistent* (Gelmon et al., 2001), as evinced by their course syllabi.

Regarding the study's third objective, we investigated relationships between participants' beliefs, intentions, and the study's external variables. Two bivariate correlational analyses, i.e., Spearman's Rho and point-biserial, were employed to address this research objective. To interpret the strength of relationships, Davis' conventions (as cited in Miller, 1994) were used to interpret the magnitude of associations. The relationships between participants' beliefs and intentions about the use of SL as a method of instruction were analyzed. A substantial and positive association ( $r_s = .553$ ;  $p < .01$ ) existed between PROS\_CLS and PROS\_COMM (see Table 3). However, the relationship between PROS\_CLS and Intentions ( $r_s = -.201$ ) was not statistically significant. Further, no significant relationships ( $p < .05$ ) existed between PROS\_COMM and the other variables of interest.

Table 3

*Spearman's Rho Correlation Matrix for Agricultural Education Teacher Educators' SL Beliefs and Intentions*

Variables	1	2	3
1. PROS_CLS <sup>a</sup>	-		
2. PROS_COMM <sup>a</sup>	.553**	-	
3. Intentions <sup>b</sup>	-.201	-.098	-

Note. \*\*Significant correlation coefficient at the 0.01 level. <sup>a</sup>PROS\_CLS and PROS\_COMM were derived from the wFSLBI and presented on a five-point, Likert-type scale: 1 = *Strongly agree* to 5 = *Strongly disagree* (Hou, 2010). <sup>b</sup>Intentions were calculated using three external raters by which participants' course syllabi were assessed against 10 quality indicators of SL: assigning "0" if an element was not present and "1" if it was found.

Relationships among the dependent variables, which measured agricultural education teacher educators' SL beliefs and intentions as well as their selected personal, professional, and institutional characteristics, were assessed using point-biserial correlational analysis. As a result, several statistically significant relationships were found at  $p < .01$ . For example, Intentions ( $r_{pb} = -.736$ ) yielded a very high and negative relationship with SL teaching experience, as well as moderate and positive relationships with PROS\_CLS ( $r_{pb} = .388$ ) and PROS\_COMM ( $r_{pb} = .319$ ). In addition, PROS\_CLS exhibited moderate and positive associations with experience as a student at the postsecondary ( $r_{pb} = .323$ ) and secondary ( $r_{pb} = .347$ ) levels, indicating that SL experiences as students were positively related to how teacher educators perceived the benefits of SL in the classroom. Other relationships between the variables were not statistically significant at  $p < .05$  (see Table 4).

Table 4

*Point-biserial Correlations for Dependent Variables Measuring the Agricultural Education Teacher Educators' Beliefs and Perceptions of Barriers Regarding SL as a Method of Instruction and their selected Personal and Professional Characteristic*

Dependent Variables	Gender	SL <sup>c</sup> Teaching Experience	SL <sup>c</sup> Postsecondary Experience	SL <sup>c</sup> Secondary Experience	Land-grant Institution Employment
PROS_CLS <sup>a</sup>	-.214	.388**	.323**	.347**	.254
PROS_COMM <sup>a</sup>	-.051	.319**	.155	.241	-.293
Intentions <sup>b</sup>	.253	-.736**	-.185	-.282	-.098

Note. \*\*Significant correlation at the 0.01 level. <sup>a</sup>PROS\_CLS and PROS\_COMM, were presented on a five-point, Likert-type scale: 1 = *Strongly agree* to 5 = *Strongly disagree* (Hou, 2010). <sup>b</sup>Intentions were calculated using three external raters by which participants' course syllabi were assessed against 10 quality indicators of SL: assigned "0" if an element was not present and "1" if it was found. <sup>c</sup> Dichotomous items were coded as "0" if participants did not have experience and "1" if they reported having SL experience.

## Conclusions

The study's purpose was to describe the *behavioral beliefs* and *intentions* (Ajzen, 1991) of agricultural education teacher educators in regard to using SL as a method of instruction. Responding to the first subscale, PROS\_CLS, participants *agreed* ( $M = 2.08$ ;  $SD = .527$ ) that

benefits to the classroom existed (see Table 1). Regarding the PROS\_COMM subscale, the respondents also generally *agreed* ( $M = 1.74$ ;  $SD = .469$ ) that SL could provide benefits to the community. To examine the teacher educators' intentions to use SL as a method of instruction, Gelmon et al. (2001) SLSAG was applied. The composite mean of the teacher educators' intention scores was 0.70 ( $SD = .846$ ), or largely *nonexistent* as based on an analysis of their course syllabi.

Findings also revealed a substantial and positive relationship ( $r_s = .553$ ;  $p < .01$ ) between PROS\_CLS and PROS\_COMM suggesting that participants' who perceived SL as benefitting the classroom also viewed it as a way to make contributions to their local communities. Regarding the point-biserial relationships, a very high and negative association ( $r_{pb} = -.736$ ) was found between SL teaching experience and teacher educators' intentions to use the method. Even though teacher educators indicated having personal experience with SL as instructors, their intention to use the method, as identified in course syllabi, was inversely related. Further, SL teaching experience exhibited moderate and positive relationships with PROS\_CLS ( $r_{pb} = .388$ ) and PROS\_COMM ( $r_{pb} = .319$ ). Finally, moderate and positive relationships also existed between SL experience as a student at the postsecondary ( $r_{pb} = .323$ ) and secondary levels ( $r_{pb} = .347$ ) and PROS\_CLS, indicating that participants' SL experiences as students positively influenced how they viewed the benefits of SL to their classrooms.

### **Limitations of the Study**

Several potential limitations of this study should be addressed. First, the data reported in this study were collected through an online questionnaire and as such was self-reported. Therefore, threats to validity may exist (Gay et al., 2012). Further, the possibility of coverage error (Dillman et al., 2014) also existed. For example, AAEE's listserv provided this investigation's respondent frame. Before completing the instrument, individuals were asked to self-identify as an agricultural education teacher educators. However, it is possible that educators who matched the parameters of the population did not receive an invitation to participate because they were not subscribed to the listserv. In addition, some participants may have misinterpreted the population parameters and chose to participate, despite not fitting the study's criteria.

### **Implications, Recommendations, and Discussion**

During the past three decades, SL has been used on many U.S. university campuses to *enhance*, *fortify*, and *infuse* didactic experiences by which students apply course-based knowledge to benefit their local communities (Banerjee & Hausafus, 2007; Smith, 2008). As gatekeepers of curricular and pedagogical decisions, faculty members are central to the method's diffusion (McKay & Rozee, 2004). Therefore, understanding faculty members', including teacher educators', beliefs and intentions is critical to developing the support needed to promote the method's widespread adoption. In this study, agricultural education teacher educators recognized the benefits, i.e., their behavioral beliefs (Ajzen, 1991), SL could provide to their *classrooms* and *communities*. However, despite these beliefs, their intentions and associated planned behaviors (Ajzen, 1991) to use the method were mostly *nonexistent*.

Related literature highlights four key strategies for achieving greater faculty buy-in for educational innovations such as SL: (1) clearly communicate the purpose of the innovation; (2) allow faculty to gain experience by trying out the change in a safe, non-judgmental environment; (3) demonstrate that institutional commitment is high; and (4) provide opportunities for faculty to personally observe the advantages of adoption (Boice, 1990; Davidson-Shivers et al., 2005; Eisen & Barlett, 2006). Therefore, future research should explore how implementing such strategies might help bridge the chasm between teacher educators' beliefs and intentions regarding SL as a method of instruction. Investigators should also explore the role that *self-efficacy* may play in mediating the relationship between teacher educators' beliefs and intentions about their use of SL.

The lack of intention to use SL also indicates the need for more understanding about opinion leaders (Rogers, 2003) in the professional networks of agricultural education teacher educators who most profoundly influence their decisions regarding curricular choices for teaching methods courses intended to prepare SBAE instructors. Such research may reveal aspects of teacher educators' perceptions about subjective norms (Ajzen, 1991) influencing their intentions to use SL. Perhaps this knowledge could help explain the ways in which educators' actual behaviors are presaged by the influence of opinion leaders within the discipline. This lack of intention also illuminates the need for more awareness about the method and its usefulness for preservice and inservice teachers of agricultural education. Because teacher educators' beliefs about SL were generally positive, perhaps future research should explore the *value* they assign to the method in comparison to other instructional approaches. By more clearly understanding the value teacher educators assign to SL, a basis might be established to articulate better its utility for achieving *student and community outcomes* as well as improving the *relevance* of the teacher education curriculum. Equipped with this knowledge, the discipline should also consider what may be the implications of stifling SL's use in its pedagogical curriculum regarding the future outcomes and impacts of SBAE programs (Graham et al., 2016).

This study also found that prior experiences, such as SL teaching experiences and personal involvement with the method as students, affected teacher educators' beliefs (Ajzen, 1991) about using SL to instruct preservice students of agricultural education. The view that previous SL experience influences the beliefs of university faculty members is well situated in existing literature outside of agricultural education (Abes et al., 2002; Hou, 2010; Russell-Stamp, 2015). However, unique to this study, agricultural educators' experiences as students at the secondary and postsecondary levels were examined, which revealed statistically significant relationships with their beliefs. Therefore, these findings expand both the SL and agricultural education literature in regard to the role of prior experiences with SL as a student and a teacher educator's predisposition to use the method.

Other than illuminating the fracture between teacher educators' SL beliefs and intentions, this investigation also revealed the critical role that prior experience plays in shaping their perspectives on this method of instruction. As a consequence, future investigations should explore the types and intensities of experiences that foreground agricultural education teacher educators' use of the method in the preparation of SBAE instructors. By more intimately understanding such experiences, work could be done to align better their beliefs and intentions. In the analysis of teacher educators' *behavioral beliefs* (Ajzen, 1991), it was apparent they

viewed SL as a benefit to classrooms and communities. Perhaps this optimistic view has created unrealistic perceptions of SL, i.e., regarding *control beliefs* (Ajzen, 1991), by which teacher educators perceive they do not have the resources, support, or time required to facilitate such an in-depth learning process given the confines of higher education. Therefore, additional questions warrant further consideration. First, should SL be operationalized as a method of instruction in teacher preparation or rather viewed as an educational philosophy for proffering, measuring, and explaining the long-term goals and impacts of agricultural education? If the latter, how should we balance SL's valuable attributes against its potential limitations or shortcomings to arrive at an appropriate philosophical stance?

### References

- Abes, E. S., Jackson, G., & Jones, S. R. (2002). Factors that motivate and deter faculty use of service-learning. *Michigan Journal of Community Service Learning*, 9(1), 5-17. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0009.101>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decisions Processes*, 50(1), 179-211. doi:10.1016/0749-5978(91)90020-T
- Ajzen, I. (2002). *Constructing a TpB questionnaire: Conceptual and methodological considerations*. Amherst: University of Massachusetts System. Retrieved from <http://www.people.umass.edu/aizen/pdf/TpB.measurement.pdf>
- Ajzen, I. (2006). *Behavioral interventions based on the theory of planned behavior*. Amherst: University of Massachusetts System. Retrieved from <http://www.people.umass.edu/aizen/pdf/tpb.intervention.pdf>
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Anderson, J. B. (2000). *Learning in deed: Service-learning and preservice teacher education*. Denver, CO: Education Commission of the States.
- Antonio, A. L., Astin, H. S. & Cress, C. M. (2000). Community service in higher education: A look at the nation's faculty. *Review of Higher Education*, 23(4), 373-398. doi: 10.1353/rhe.2000.0015
- Astin, A.W., & Sax, L. J. (1998). How undergraduates are affected by service participation. *Journal of College Student Development*, 39(3), 251-263. Retrieved from <http://digitalcommons.unomaha.edu/slcehighered/7>
- Astin, A. W., Sax, L. J., & Avalos, J. (1999). Long-term effects of volunteerism during the undergraduate years. *Review of Higher Education*, 22(2), 187-202. Retrieved from <https://muse.jhu.edu/article/30068/summary>
- Banerjee, M., & Hausafus, C.O. (2007). Faculty use of service-learning: Perceptions, motivations, and impediments for the human sciences. *Michigan Journal of Community*

*Service Learning*, 14(1), 32-45. Retrieved from  
<http://hdl.handle.net/2027/spo.3239521.0014.103>

- Barth, M., Bent, M., Fischer, D., Richter, S., & Rieckmann, M. (2014). Learning to change universities from within: A service-learning perspective on promoting sustainable consumption in higher education. *Journal of Cleaner Production*, 62(1), 72-81. doi: 10.1016/j.jclepro.2013.04.006
- Birkenholz, R. J., & Simonsen, J. C. (2011). Characteristics of distinguished programs of agricultural education. *Journal of Agricultural Education*, 52(3), 16-26. doi: 10.5032/jae.2011.03016
- Boice, R. (1990). Faculty resistance to writing-intensive courses. *Teaching of Psychology*, 17(1), 13-17. doi:10.1207/s15328023top1701\_3
- Bornmann, L., Mutz, R., & Daniel, H. D. (2010). A reliability-generalization study of journal peer reviews: A multilevel meta-analysis of inter-rater reliability and its determinants. *PLoS ONE*, 5(12), 1-10. doi:10.1371/journal.pone.0014331
- Bringle, R. G., & Hatcher, J. A. (1996). Implementing service learning in higher education. *Journal of Higher Education*, 67(2), 221-239. doi:10.2307/2943981
- Bulut, J. J., & Johnson, C. J. (2006). Rewards and costs of faculty involvement in service-learning. *Educational Gerontology*, 32(8), 633-645. doi:10.1080/03601270500494121
- Butin, D. W. (2006). The limits of service-learning in higher education. *The Review of Higher Education*, 29(4), 473-498. doi:10.1353/rhe.2006.0025
- Butin, D. W. (2010). *Service-learning in theory and practice: The future of community engagement in higher education*. New York, NY: Palgrave.
- Colbeck, C. L., & Wharton-Michael, P. (2006). Individual and organizational influences on faculty members' engagement in public scholarship. *New Directions for Teaching and Learning*, 2006(105), 17-26. doi:10.1002/tl.220
- Conway, J. M., Amel, E. L., & Gerwien, D. P. (2009). Teaching and learning in the social context: A meta-analysis of service learning's effects on academic, personal, social, and citizenship outcomes. *Teaching of Psychology*, 36(4), 233-245. doi:10.1080/00986280903172969
- Cooper, J. R. (2014). Ten years in the trenches: Faculty perspectives on sustaining service-learning. *Journal of Experiential Education*, 37(4), 415-428. doi:10.1177/1053825913513721
- Crews, R. J. (2002). *Higher education service-learning: Sourcebook*. Westport, CT: Oryx Press.

- Davidson-Shivers, G. V., Salazar, J., & Hamilton, K. M. (2005). Design of faculty development workshops: Attempting to practice what we preach. *College Student Journal*, 39(3), 528-539. Retrieved from <https://eric.ed.gov/?id=EJ725588>
- DeLeeuw, A., Valois, P., Ajzen, I., & Schmidt, P. (2015). Using the theory of planned behavior to identify key beliefs underlying pro-environmental behavior in high-school students: Implications for educational interventions. *Journal of Environmental Psychology*, 42, 128-138. Retrieved from <https://doi.org/10.1016/j.jenvp.2015.03.005>
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). Hoboken, NJ: John Wiley & Sons.
- Eisen, A., & Barlett, P. (2006). The Piedmont project: Fostering faculty development toward sustainability. *The Journal of Environmental Education*, 38(1), 25–35. doi: 10.3200/JOEE.38.1.25-36
- Eyler, J. (2002). Reflection: Linking service and learning: Linking students and communities. *Journal of Social Issues*, 58(3), 517-534. doi:10.1111/1540-4560.00274
- Eyler, J., & Giles, D. E. (1999). *Where's the learning in service-learning?* San Francisco, CA: Jossey-Bass.
- Eyler, J., Giles, D. E., Stenson, C. M., & Gray, C. J. (2001). *At a glance: What we know about the effects of service-learning on college students, faculty, institutions, and communities, 1993-2000* (3rd ed.). Nashville, TN: Vanderbilt University.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Thousand Oaks, CA: Sage.
- Furco, A., & Moely, B. E. (2012). Using learning communities to build faculty support for pedagogical innovation: A multi-campus study. *Journal of Higher Education*, 83(1), 128-153. doi:10.1353/jhe.2012.0006
- Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Boston, MA: Pearson.
- Gelmon, S. B., Holland, B. A., Driscoll, A., Spring, A., & Kerrigan, S. (2001). *Assessing service learning and civic engagement: Principles and techniques*. Providence, RI: Campus Compact.
- Giles, D. E., Jr., & Eyler, J. (1994). The theoretical roots of service-learning in John Dewey: Toward a theory of service-learning. *Michigan Journal of Community Service Learning*, 1(1), 77-85. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0001.109>
- Graham, D. L., Arnold, S., & Jayaratne, K. S. U. (2016). Research priority 6: Vibrant, resilient communities. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds.), *American*

- Association for Agricultural Education national research agenda: 2016-2020* (pp. 49-56). Gainesville: Department of Agricultural Education and Communication, University of Florida.
- Hinck, S. S., & Brandell, M. E. (2000). The relationship between institutional support and campus acceptance of academic service learning. *American Behavioral Scientist*, 43(5), 868-881. doi:10.1177/00027640021955522
- Hou, S. I. (2010). Developing a faculty inventory measuring perceived service-learning benefits and barriers. *Michigan Journal of Community Service Learning*, 16(2), 78-89. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0016.206>
- Hou, S. I., & Wilder, S. (2015). How ready is higher education faculty for engaged student learning? Applying transtheoretical model to measure service-learning beliefs and adoption. *SAGE Online Journal*, 5(1), 1-9. doi:10.1177/2158244015572282
- Kantrovich, A. J. (2010). *The 36th volume of a national study of the supply and demand for teachers of agricultural education 2006-2009*. West Olive, MI: American Association for Agricultural Education. Retrieved from <http://aaeonline.org/Resources/Documents/2010%20Supply%20and%20Demand%20study%20report%20v5.pdf>
- Kellogg Commission on the Future of State and Land-Grant Universities. (1999). *Returning to our roots: The engaged institution*. Washington, DC: National Association of State Universities and Land Grant Colleges. Retrieved from <https://eric.ed.gov/?id=ED426676>
- Kezar, A. (2013). Departmental cultures and non-tenure track faculty: Willingness, capacity, and opportunity to perform service-learning at four-year institutions. *Journal of Higher Education*, 84(2), 153-183. doi:10.1353/jhe.2013.001
- Kumar, R., Karabenick, S. A., & Burgoon, J. N. (2015). Teachers' implicit attitudes, explicit beliefs, and the mediating role of respect and cultural responsibility on mastery and performance-focused instructional practices. *Journal of Educational Psychology*, 107(2), 533-545. Retrieved from <http://psycnet.apa.org/doi/10.1037/a0037471>
- McKay, V. C., & Rozee, P. D. (2004). Characteristics of faculty who adopt community service learning pedagogy. *Michigan Journal of Community Service Learning*, 10(2), 21-33. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0010.202>
- Meaney, K., Griffin, K., & Bohler, H. (2009). Service-learning: A venue for enhancing pre-service educators' knowledge base for teaching. *International Journal for the Scholarship of Teaching and Learning*, 3(2), 1-17. doi:10.20429/ijstl.2009.030221
- Miller, L. E. (1994). Correlations: Description or inference? *Journal of Agricultural Education*, 35(1), 5-7. doi:10.5032/jae.1994.01005
- Pribbenow, D. A. (2005). The impact of service-learning pedagogy on faculty teaching and learning. *Michigan Journal of Community Service Learning*, 11(2). Retrieved from

<http://hdl.handle.net/2027/spo.3239521.0011.20>

- Roberts, R. (2017). *The beliefs and intentions of agricultural education teacher educators regarding service-learning as a method of instruction: A mixed methods study* (Doctoral Dissertation). Oklahoma State University: Stillwater.
- Roberts, R., & Edwards, M. C. (2015). Service-learning's ongoing journey as a method of instruction: Implications for school-based, agricultural education. *Journal of Agricultural Education*, 56(2), 217-233. doi:10.5032/jae.2015.02217
- Roberts, R., & Edwards, M. C. (2018). Imaging service-learning in *The Agricultural Education Magazine* from 1929 to 2009: Implications for the method's reframing and use. *Journal of Agricultural Education*, 59(3), 15-35. Retrieved from <https://doi.org/10.5032/jae.2018.03015>
- Roberts, R., Edwards, M. C., & Ivey, T. A. (2018). *Planned behavior typologies of agricultural education teacher educators in regard to service-learning as a method of instruction: A national, mixed methods study*. Paper presented at the 45th Annual Conference of American Association for Agricultural Education, Charleston, SC.
- Roberts, R. Edwards, M. C., & Robinson, J. S. (2018). *Deterrents to service-learning's use as a method of instruction in the preparation of agricultural education teachers: The beliefs and intentions of teacher educators*. Paper presented at the 45th Annual Conference of American Association for Agricultural Education, Charleston, SC.
- Roberts, R., Terry, R., Jr., Brown, N. R., & Ramsey, J. W. (2016). Students' motivations, value, and decision to participate in service-learning at the National FFA Days of Service. *Journal of Agricultural Education*, 57(2), 187-202. doi:10.5032/jae.2016.02187
- Smith, C. P. (2008). *Perceptions, motivations, and concerns of post-secondary faculty regarding implementing service-learning pedagogy into curriculum* (Doctoral dissertation). Available from ProQuest. (UMI No. 3444942)
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: The Free Press.
- Russell-Stamp, M. (2015). Faculty use of community-based learning: What factors really matter? *Michigan Journal of Community Service Learning*, 21(2), 37-48. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0021.203>
- Shrout, P. E., & Fliess, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin*, 86(2), 420-428. doi:10.1037/0033-2909.86.2.420
- Speck, B. W., & Hoppe, S. L. (2004). *Service learning: History, theory, and issues*. Westport, CT: Praeger Press.
- Sutter, N., & Paulson, S. (2017). Predicting college students' intention to graduate: A test of the

theory of planned behavior. *College Student Journal*, 50(3), 409-421. Retrieved from <https://www.ingentaconnect.com/contentone/prin/csj/2017/00000050/00000003/art00013>

Vogel, A. L., Seifer, S. D., & Gelmon, S. B. (2010). What influences the long-term sustainability of service learning? Lessons from early adopters. *Michigan Journal of Community Service Learning*, 17(1), 59-76. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0017.105>

Wade, A., & Demb, A. (2009). A conceptual model to explore faculty community engagement. *Michigan Journal of Community Service Learning*, 15(2), 5-16. Retrieved from <http://hdl.handle.net/2027/spo.3239521.0015.201>

## Discussant Remarks

### **Benefits of Using Service-Learning in the Preparation of Teachers: An Analysis of Agricultural Education Teacher Educators' Beliefs and Intentions**

Discussant: Leslie D. Edgar, University of Georgia

#### **Summary of Article**

This manuscript addresses a significant issue related to preparing teachers and the use of service-learning (SL) to assist with community and civic engagement. I want to commend the authors on an excellent, well-written article. The theoretical/conceptual framework of this article was based on Ajzen's (1991, 2002) theory of planned behavior (TPB) and "was employed as a basis for investigating the beliefs and intentions expressed by teacher educators of agricultural education regarding SL as an instructional method for them *and* their preservice students." Additionally, the researchers modified TPB to include identified external variables in the conceptual model. This model is comprehensive and would serve as a good baseline for others interested in research focused on SL. The methods used were in-depth and limitations were reported. The conclusions provide a good summary of the research, and lead the reader to consider more deeply the "so what" of SL integration into our teacher preparation coursework.

#### **Selected Questions for Discussion and Further Research or Future Practice**

1. As a discipline, we tout we are the experts in preparing students to be teachers. As your article outlines, "SL is integrated into the curriculum and seeks to foster academic achievement while also generating greater social and cultural understanding through student reflection and subsequent actions". Why, then, as a discipline, have we been slow to integrate SL into our courses/classrooms, even though we understand the importance of it?
3. I appreciated the questions you posed in your recommendation section. These are important and I want to repeat them here for discussion: "First, should SL be operationalized as a method of instruction in teacher preparation or rather viewed as an educational philosophy for proffering, measuring, and explaining the long-term goals and impacts of agricultural education? If the latter, how should we balance SL's valuable attributes against its potential limitations or shortcomings to arrive at an appropriate philosophical stance?"
4. As a discipline and within limited/reduced hours, how do we prepare our students with the competencies they will need to be successful teachers in the future? As we consider this question, should SL competencies be integrated in our required core courses?
5. What is your advice regarding how others can purposefully integrate SL into their courses to effectively prepare students teachers? Why is this an important instructional method to assist our new teachers with understanding their beliefs, decision-making behaviors, and motivations as outlined in Ajzen's (1991) work?

# **Agriculture Organization Members' Communication Preferences and Motivation to Contact Elected Officials about Agriculture and Natural Resources Issues**

Levy George Randolph II, University of Florida  
Caroline R. Warwick, University of Florida  
Shelli D. Rampold, University of Florida  
Ricky W. Telg, University of Florida

## ***Abstract***

*The agriculture sector has been influenced significantly by agriculture and natural resources (ANR) policies developed and voted in by national, state, and local elected officials. As many agriculture agencies and organizations have served as a voice for members of the ANR sectors, it is necessary for such organizations and their members to be able to use that voice effectively and when needed to communicate ANR policy information to elected officials. This study was conducted to examine the communication preferences of members of Florida agriculture organizations and factors that motivate them to contact elected officials about an ANR issue or policy. Members in this study least preferred to be contacted by their organization(s) via phone call or text message. However, members indicated a phone call or text message from their organization(s) would motivate them to contact an elected official about an ANR issue or policy. When contacting members to spur their involvement in ANR policy decisions, leaders of agricultural organizations should use phone calls to convey to members how the ANR policy may impact them and their community. Moreover, to better convey the policy impact to members, organization leaders should provide members with information from local Extension offices and the university. Future research is needed to examine other factors that may influence agriculture organization members' communication with elected officials, as well as examine the types of messaging strategies organizational leaders can use to further involve their members in ANR policy decisions. This study should be replicated with members of other agriculture organizations in other states to better assess how the voice of the larger agriculture industry can impact ANR policy decisions.*

Key terms: agriculture and natural resources (ANR) policy, agricultural organization members, communication preferences, elected officials, motivation

## **Introduction**

The U.S. agriculture sector produces an abundant output of food and resources for the nation and world, which has been made possible through the implementation of innovative practices and new technologies (Enns, Martin, & Spielmaker, 2016). In Florida, the agriculture industry is robust, with more than 47,000 farms spanning across nearly 9.5 million acres and commodities accounting for approximately \$4 billion in U.S. exports (Florida Department of Agriculture and Consumer Services, 2018). The agriculture industry in Florida has been shaped significantly by agriculture and natural resources (ANR) policies pertaining to topics such as the

implementation of innovative practices and technologies, production, trade, and conservation (Florida Farm Bureau, 2018). Moreover, ANR policies and associated regulations have been closely connected to the income and livelihood of farmers and ranchers (Kaufman, Israel, & Irani, 2008). Such policies and regulations have often been determined and voted in by elected officials (Effland, 2000). Therefore, elected officials have become a key role in the functions of agricultural operations.

Prior research has highlighted the importance of sources of communication that influence policy, such as constituents and opinion leaders (Noble, 2005; Salazar, 2015; Shipley, 2000). Agricultural organizations and their members are key constituents who are well-positioned to share first-hand stories and pertinent information to elected officials. Agricultural organizations have also sought to serve as a “voice” for the ANR industry in Florida and engage policymakers in ANR issues (Florida Farm Bureau, 2010). However, information from these organizations may not reach policymakers to the degree intended. In a study conducted with elected officials’ aides, Boone, Tucker, and McClaskey (2002) found aides often sought ANR related information first from government and internal sources before consulting contacts within the ANR communities. With more organizations making a push for their members to email, call, and/or write their representatives, it is imperative to identify the best routes for establishing communication between ANR organization members and elected officials.

To better influence ANR policy, it is important for agricultural organizations to utilize effective methods of communicating ANR policy information to their members, as well as be cognizant of methods to prepare and motivate members to communicate with elected officials (Effland, 2000). According to Grunig (2008), the organizational effectiveness of such groups is largely driven by how their communication system is organized. Grassroot efforts to influence elected officials’ views and decision-making regarding ANR policies can be better focused by organizations understanding the communication preferences of both their members and officials (Salazar, 2015). While face-to-face communication has remained a popular method in politics among aides, lobbyists, and interest groups, these communication channels commonly used in the past are being replaced by new, technology-driven communication processes (Salazar, 2015). As such, organizational communication about policies impacting the ANR sector will likely be driven by new technologies in years to come (Salazar, 2015). Therefore, research is needed to examine the current communication preferences held by members of agricultural organizations, elected officials, and the aides of elected officials.

It is also important for agricultural organization leaders to utilize methods of communication that may motivate their members to take an active role in ANR policy decisions by contacting elected officials about an ANR issue. Hinkle, Fox-Cardamonde, Haseleu, Brown, & Irwin (1996) proposed a model to better examine and explain the intentions of organizational members to become active in the grassroots, political endeavors of their organizations. According to Hinkle et al. (1996), the communicated felt norms and social pressures of the organization play a large role in motivating members to act on behalf of the group. In the context of this study, clear communication from agricultural organization leaders regarding the need to contact elected officials about an ANR issue may influence the likelihood members will contact

an elected official about that issue. It may also be important for organizational leaders to consider the framing of the messages being communicated to their members (Telg, Brasford, & Irani, 2005). Telg et al. (2005) maintained an issue must be framed to appeal to agriculture organization members' sense of responsibility to fellow farmers, their community, and the agricultural industry as a whole. Further research is needed to better understand how agricultural organization leaders should frame messages communicated to their members to increase the likelihood members will contact elected officials about ANR issues and policies.

### Conceptual Framework and Review of Literature

Weick's (1979) Model of Organizing was modified by the researchers to propose a comprehensive framework for examining agriculture organizations members' communication preferences and motivation to communicate with elected officials (see Figure 1). Organizations are defined as "structures of mutual expectation, attached to roles which define what each of its members shall expect from others and from himself," (Vickers, 1967, p. 109). When communicating with members, organizations both have expectations of their membership and are held to expectations by their membership. Per the proposed model, communication between agriculture organizations and their membership follows a linear model, beginning with an ecological change that spurs information retention, selection, and enactment.

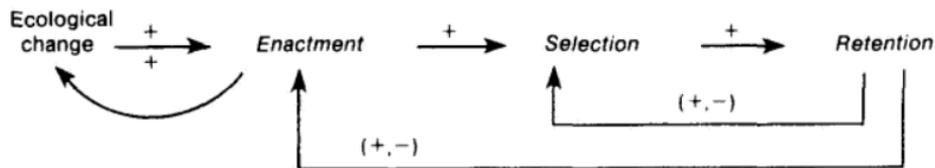


Figure 1. Conceptual model to explain agriculture organization members' communication preferences and motivation. Reprinted from "Model of Organizing" by Weick, K. E. (1979). *The social psychology of organizing*. Reading, MA: Addison-Wesley

An *ecological change*, also referred to as an environmental change, can be any disruption in standard practices, activities, rules, laws, systems, or organizations that are cause for discussion or concern (Haveman, 1992). Ecological changes primarily involve an actor, organization or change agent, an action, and an unanticipated consequence for the actor, organization, or stakeholders (Jennings & Greenwood, 2009). Once a change is occurring, organization members decide how to make sense of the change and how to proceed with the change. Members often respond in one of two ways: with the creation of new rules or by employing outside action (Weick, 1979). Organizations also have responses to ecological change. This response may take the form of encouraging members to act or changing internal systems to address organizational problems or needs (Mumby, 2012). When it comes to ecological change, the agricultural industry is unique in that it is constantly in the midst of major structural change (i.e. changes in product characteristics, technology, scale, scope and pace) while also facing constant change in industry regulation (Kaufman, Israel, & Irani, 2007;

Boehlje, 1999). In addition to being constant, change is quick, forcing agricultural organizations to reply rapidly on behalf of their membership to proposed legislation, new regulations, and demands (Kaufman, Israel, & Irani, 2007; Telg, Basford, & Irani, 2005).

*Retention* refers to an individual's storage of information for future application (Weick, 1979). Every day, individuals receive thousands of messages, both directly and indirectly, in attempts to change their opinion, attitudes, behaviors or purchasing decisions (Hunt, 2004; Funkhouser & Parker, 1999). Retention explores information's ability to compete with other messages and make a lasting impact in an individual's memories (Mumby, 2012; Weick, Sutcliffe & Obstfeld, 2005). Most often, an individual's retention of specific information is often based on their previous experiences and prioritizations. These previous experiences serve as frames, continuously building on earlier actions and reactions (Jennings & Greenwood, 2009). As an individual becomes more familiar with a message, change or communication, they begin to have better message retention on a particular topic (Mumby, 2012; Jennings & Greenwood, 2009). Communicating with elected officials can be challenging for agriculture community members, although policymakers often turn to trusted industry representatives for information on policy and stakeholder impacts (Shanley & Lopez, 2009). Information about scientific findings is often inaccessible, equivocal, often underreported and seldom takes into account the calendars of executive or legislative policymakers (Gregrich, 2003).

The *selection* of information refers to the process by which information is made meaningful (Weick et al., 2005). As individuals make information meaningful, the number of possible meanings gets reduced as a combination of mental models, articulation and retrospective attention reduce the amount of information available into a coherent idea or option (Weick et al., 2005). Selection is often seen as the most complex of the organizational communication process, as it can be difficult to define, encompasses various components and criteria can be attributed to an infinite number of sources (Simon, 1957; Weick, 1979). Selection criteria are paramount for organizations and decision makers, as what cues they use, why they use those cues and the process of scanning and monitoring information all have an impact on an organization's communication (Weick, 1979). Selection criteria expand beyond existing knowledge, however, as trust plays a large factor in an individual's acceptance of information from an organization (Settle, Rumble, McCarty, & Ruth, 2017). Individuals become affiliated with a group or organization when they inherently support what the group does, and is particularly true in agriculture (Telg, Basford, & Irani, 2005; Hinkle, Fox-Cardamonde, Haseleu, Brown, & Irwin, 1996). Individuals, even when misinformed or uninformed, will rely on trusted organizations to shape their opinions on science-based issues (Brossard & Nisbet, 2017). If an individual trusts an organization, they are more likely to trust an organization's communications (Brossard & Nisbet, 2007). Therefore, understanding individuals' communication preferences when interacting with agricultural organizations is paramount for organizations hoping to inform, educate, and connect with members or influence policymakers (Shanley & Lopez, 2009).

The *enactment* pertains to the fact that "when people act, they bring events and structures into existence and set them in motion," (Weick, 1988, p. 306). In a broad sense, enactment refers to an individual's response to a change, their motivations for their change and actions brought

about because of their decision (Jennings & Greenwood, 2009). When organizations are working with members, broadening the number of ways members can interact and provide feedback to the organization is important, as well as the number of issues the organization pays attention to (Weick, 1979). Organizations interact with their environment by not only responding to changes but also by what they choose to pay attention to (Mumby, 2012). As a part of the communication process, enactment presents yet another challenge for agricultural organizations even when members act. Public participation in science-legislation related action, whether through public hearings, conferences, demonstrations, or other events, is made complex by legislations' or organizations' ability to successfully host, much less have attended, events that promote discussion and educate policymakers or the public (Janse & Konijnendijk, 2007).

Sensemaking may also influence agriculture organizations members' communication preferences and motivation to communicate with elected officials. Defined as one of the primary functions of organizational communication (Neher, 1997), sensemaking accounts for the process by which issues are "turned into situations that serve as a springboard to action," (Taylor & Van Every, 2000, p. 275). The sensemaking process is ongoing, instrumental, social, and easily taken for granted, positioning its central role in determining human behavior (Weick et al., 2005). When new issues arise, individuals go through a multi-step process to try and find meaning. Individuals first look to reasons for the issue, whether institutional constraints, traditions, or organizational standards that may have caused the issue. Individuals then seek information, often from opinion leaders or organizations, about the issue and its direct impact on their day-to-day lives. As individuals begin to understand the issue, sensemaking accounts for the process by which meaning materializes, informing action and becoming an issue of communication (Mills, 2003; Weick et al., 2005). It is important to distinguish, however, the difference between educating members and persuading membership. Education is used to increase knowledge and broaden horizons whereas persuasion is used to narrow options to assist a decision maker (Lamm, 2017). When working with membership, agricultural organizations must be sure to encourage and educate members rather than try to persuade them to interact with public officials (Lamm, 2017). In this study, agricultural organizations often did not distinguish between using educational and persuasive communication techniques, and although they were engaged with membership, still did not understand the most effective way to communicate with individuals. The inclusive findings or prior research in this area, especially in challenges faced in communication, suggests the need for further study regarding agriculture organizations members' communication preferences and motivation to communicate with elected officials.

### **Purpose and Objectives**

The purpose of this descriptive study was to examine Florida agriculture organization members' communication preferences for receiving agriculture and natural resources (ANR) information and their motivation to communicate with elected officials about ANR issues. The following objectives guided this study:

1. Describe how often and through which communication methods Florida agriculture organization members prefer to receive ANR information from their organization(s).

2. Describe Florida agriculture organization members' perceived trustworthiness of select sources as sources of ANR information.
3. Describe the degree to which methods of communication from Florida agriculture organizations would motivate members to contact local, state, or national elected officials about an ANR issues or policy.
4. Describe the degree to which types of impact of an ANR policy motivate Florida agriculture organization members to contact a local, state, or national elected official.

## Methodology

### Population and Sample

The targeted population of this study consisted of active listserv members of the following Florida agricultural organizations: Florida Farm Bureau ( $n = 839$ ); Florida Nursery, Growers and Landscape Association ( $n = 3,934$ ); Florida Cattlemen's Association ( $n = 5,920$ ); Florida Fruit and Vegetable Association ( $n = 1,061$ ); and Wedgworth Leadership Institute ( $n = 306$ ). Useable responses were collected from 439 members across all organizations. Multiple membership was high among this population, and participants were asked to take the survey only once. A true response rate could not be reported due to the possibility of study participants being members of more than one of the agriculture organizations. In addition, data collection methods did not allow for the random sampling of non-respondents to compare to respondents. As such, nonresponse bias was assessed by comparing early to late respondents (Miller & Smith, 1983). This method has been used frequently in agricultural education research (Lindner et al., 2003; Johnson & Shoulders, 2017), as well as been identified as appropriate for addressing nonresponse based on the assumption that late respondents are similar to nonrespondents (Burkell, 2003; Lindner et al., 2003; Miller & Smith, 1983). Two-tailed independent  $t$ -tests were used to determine if statistically significant differences existed at the .01 alpha level between early respondents (those responding prior to the third reminder email;  $n = 317$ ) and late respondents ( $n = 122$ ) on the variables of interest in this study (i.e. communication preferences, motivation to contact an elected official, source trustworthiness). No significant differences for any variable were found between early and late respondents.

Agriculture organization members who participated in this study were members of: Florida Farm Bureau ( $f = 306$ ; 70%); Florida Cattlemen's Association ( $f = 299$ ; 68%); Florida Fruit and Vegetable Association ( $f = 61$ ; 14%); Wedgworth Leadership Institute ( $f = 59$ ; 13%); and Florida Nursery, Growers and Landscape Association ( $f = 46$ ; 10%; note that percentages may not add up to 100% due to the ability for respondents to be members of more than one organization). The majority of respondents were white ( $f = 403$ ; 92%), male ( $f = 334$ ; 76%), and were distributed evenly across age categories ranging from 30 to 69 years old. Few respondents were 29 years of age or younger ( $f = 17$ ; 4%) or 70 years of age or older ( $f = 46$ ; 10%). More respondents ( $f = 167$ ; 38%) reported a yearly household income \$75,000 to \$149,999 than any other income bracket. Regarding their political beliefs and affiliations, half of the respondents ( $f = 221$ ; 50%) held conservative beliefs, and the majority ( $f = 321$ ; 73%) identified as Republican.

Lastly, half of the respondents ( $f = 221$ ; 50%) lived on a farm in a rural area, and the majority ( $f = 348$ ; 79%) were currently involved in agriculture for a living.

### **Data Collection**

Data was collected using an online survey questionnaire. Leaders of each organization were contacted and asked to distribute an introductory email, as well as three follow-up reminder emails to the members of their organization. Each email included a brief description of the study and an online link to the survey questionnaire. The lack of direct contact between researchers and the population of this study may have posed limitations to the effectiveness of the data collection efforts. The agricultural organization leaders distributed the initial email, as well as were responsible for sending the follow-up emails. The lack of ability to report an exact response rate due to the possibility of multiple membership was also a limitation of this study.

### **Instrument**

A survey questionnaire was developed by the researchers and used as the instrument for this study. The questionnaire was reviewed for face and content validity by an expert panel that consisted of three agricultural communication faculty members, executive directors from three Florida agricultural organizations, an agricultural organization policy director, a communications director, and one agricultural leadership organization director. The panel provided feedback to enhance the alignment of the questionnaire with the goals of this study and the interests of the participating organizations. The panel provided recommendations for edits to the questionnaire regarding item wording, item inclusion, and response option scales. These recommendations were taken into consideration by the researchers to produce the final questionnaire, which was deemed acceptable by the panel. Post hoc reliability estimates were calculated using Cronbach's alpha.

The first section of the instrument was designed to examine how often and through which methods Florida agriculture organization members preferred to receive ANR information from their organization(s). First, respondents were asked to indicate how frequently they like to receive information from their organization(s) (e.g. daily, twice a week, once a month, etc.). Respondents were then asked to indicate their degree of preference for being contacted by their organizations via various communication channels (e.g. email newsletter, phone call, social media posts). Responses were collected using a 5-point Likert-type scale: 1 = *not at all preferred*; 2 = *slightly preferred*; 3 = *moderately preferred*; 4 = *very preferred*; and 5 = *extremely preferred*. Real limits were set for the interpretation of responses: 1.00 to 1.49 = *not at all preferred*; 1.50 to 2.49 = *slightly preferred*; 2.50 to 3.49 = *moderately preferred*; 3.50 to 4.49 = *very preferred*; and 4.50 to 5.00 = *extremely preferred*. The internal reliability for this scale was  $\alpha = .52$ . Members who indicated some degree of preference (i.e. slightly, moderately, very, or extremely) for receiving information via social media platforms were asked to indicate, by checking all that apply, which social media platforms they would like their organization(s) to use.

The second section of the instrument was designed to measure agricultural organization members' perceived trustworthiness of sources of ANR information. Respondents were asked to indicate the degree of trustworthiness associated with 21 items, such as "internet news sources," "local TV news channels," and "federal agriculture and natural resource organizations/agencies." Responses were collected using a 5-point Likert scale: 1 = *very untrustworthy*; 2 = *untrustworthy*; 3 = *neither trustworthy nor untrustworthy*; 4 = *trustworthy*; and 5 = *very trustworthy*. Real limits were set for the interpretation of responses: 1.00 to 1.49 = *very untrustworthy*; 1.50 to 2.49 = *untrustworthy*; 2.50 to 3.49 = *neither trustworthy nor untrustworthy*; 3.50 to 4.49 = *trustworthy*; and 4.50 to 5.00 = *very trustworthy*. The internal reliability for this scale was  $\alpha = .88$ .

The third section of the instrument was intended to examine which methods of communication from agricultural organizations would motivate members to contact an elected official about an ANR issue or policy. Respondents were asked to indicate their level of agreement with eight statements, such as "an email newsletter from my agricultural organization(s) would motivate me to contact an elected official about an agriculture or natural resources issue" and "a phone call from my organization(s) would motivate me to contact an elected official about an agriculture or natural resources issue." Responses were collected using a 5-point Likert scale: 1 = *disagree strongly*; 2 = *disagree*; 3 = *neither disagree nor agree*; 4 = *agree*; and 5 = *agree strongly*. Real limits were set for the interpretation of responses: 1.00 to 1.49 = *disagree strongly*; 1.51 to 2.50 = *disagree*; 2.51 to 3.50 = *neither disagree nor agree*; 3.51 to 4.50 = *agree*; and 4.51 to 5.50 = *agree strongly*. The internal reliability for this scale was  $\alpha = .74$ .

The fourth section of the instrument was designed to determine the types of impact that would motivate Florida agriculture organization members to contact an elected official about an ANR issue. Respondents were asked to indicate their level of agreement with four items such as "I would contact a local, state, or national elected official about legislation that has a direct negative impact on me," and "I would contact a local, state, or national elected official about legislation that has a direct negative impact on Florida farmers." Responses were collected using the previously mentioned 5-point Likert-type scale of agreement, and the same real limits were used for the interpretation of responses. An overall mean was calculated to represent agriculture organization members' agreement with negative legislative impact as motivation to contact an elected official. The internal reliability for this scale was  $\alpha = .90$ .

## **Data Analysis**

Descriptive statistics were used for all objectives. Frequencies and percentages were reported for nominal and ordinal variables, while means and standard deviations were reported for all interval level data.

## **Findings**

### **Objective One**

Objective one sought to describe agricultural organization members' preferred methods of being communicated to by their organization(s). Members in this study reported the highest degree of preference for being communicated to by their organization(s) via email ( $M = 3.97$ ;  $SD = 1.01$ ) or printed magazine ( $M = 3.53$ ;  $SD = 1.23$ ). All other forms of communication were only moderately or slightly preferred, with phone calls ( $M = 1.90$ ;  $SD = 1.15$ ) being the least preferred (see Table 1).

Table 1

*Florida Agriculture organization members' preferences for communication methods used by their organization(s) to communicate ANR information to them.*

Item	<i>M</i>	<i>SD</i>	Interpretation
Email Newsletter	3.97	1.014	Very preferred
Printed Magazine	3.53	1.227	Very preferred
Printed Newsletter	2.91	1.299	Moderately preferred
Social Media Posts	2.52	1.437	Moderately preferred
Videos delivered via Social Media	2.47	1.372	Slightly preferred
Text Message	2.45	1.267	Slightly preferred
Webinars	2.15	1.173	Slightly preferred
Phone Call	1.90	1.145	Slightly preferred

*Note:* Real Limits: 1.00 to 1.49 = *Not at all preferred*, 1.50 to 2.49 = *Slightly preferred*, 2.50 to 3.49 = *Moderately preferred*, 3.50 to 4.49 = *Very preferred*, 4.50 to 5.00 = *Extremely preferred*

## Objective Two

Objective two was to describe Florida agriculture organization members' perceived trustworthiness of select sources as sources of ANR information. Members in this study identified several sources as trustworthy sources of ANR information (see Table 2). The members in this study identified local Extension offices ( $M = 4.22$ ;  $SD = .758$ ), the university ( $M = 4.21$ ;  $SD = .758$ ), and the Center for Public Issues Education in Agriculture and Natural Resources ( $M = 4.15$ ;  $SD = .745$ ) as the most trust worthy sources for ANR information. Nine items were identified by members as neither trustworthy nor untrustworthy, such as community events ( $M = 3.48$ ;  $SD = .746$ ) local news channels ( $M = 2.93$ ;  $SD = .900$ ) and lobbyists ( $M = 2.75$ ;  $SD = .900$ ). Lastly, members identified only two sources of information as untrustworthy, including network TV news channels ( $M = 2.37$ ;  $SD = 1.05$ ) and social media ( $M = 2.33$ ;  $SD = .870$ ).

Table 2

*Florida agriculture organization members' perceived trustworthiness of sources of ANR information*

Item	<i>M</i>	<i>SD</i>	Interpretation
Local Extension Office	4.22	.758	Trustworthy
University	4.21	.758	Trustworthy
UF/IFAS Center for Public Issues Education in Agriculture and Natural Resources (PIE Center)	4.15	.745	Trustworthy
Agricultural Specialists	4.14	.658	Trustworthy
Peer Reviewed Journal Articles	3.98	.832	Trustworthy
Fact Sheets	3.98	.710	Trustworthy
Technical Reports	3.98	.708	Trustworthy
Seminars or Conferences	3.90	.671	Trustworthy
State agriculture and natural resource organizations/agencies	3.80	.790	Trustworthy
Federal agriculture and natural resource organizations/agencies	3.57	.836	Trustworthy
Community Events	3.48	.746	Neither trustworthy nor untrustworthy
Magazines	3.13	.843	Neither trustworthy nor untrustworthy
News radio channels	2.96	.867	Neither trustworthy nor untrustworthy
Local TV news channels	2.93	.900	Neither trustworthy nor untrustworthy
Newspaper	2.80	.972	Neither trustworthy nor untrustworthy
Lobbyists	2.75	.900	Neither trustworthy nor untrustworthy
Internet news sources	2.70	.868	Neither trustworthy nor untrustworthy
TV programs (not news)	2.65	.905	Neither trustworthy nor untrustworthy
National Cable TV News Channels	2.54	.995	Neither trustworthy nor untrustworthy
National Network TV News Channels	2.37	1.051	Untrustworthy
Social Media	2.33	.870	Untrustworthy

*Note:* Real Limits: 1.00 to 1.49 = *Very untrustworthy*, 1.50 to 2.49 = *Untrustworthy*, 2.50 to 3.49 = *Neither trustworthy nor untrustworthy*, 3.50 to 4.49 = *Trustworthy*, 4.50 to 5.00 = *Very trustworthy*

### Objective Three

Objective three sought to describe agricultural organization members' level of agreement with select forms of communication from their organization(s) as motivation to contact an elected official about an ANR issue or policy. Members in this study demonstrated the highest

level of agreement with email newsletters ( $M = 3.82$ ;  $SD = .866$ ) and printed letters ( $M = 3.53$ ;  $SD = .998$ ) as methods of communication that would motivate them to contact elected officials. Members neither agreed nor disagreed with the remaining methods of communication as motivating them to contact an elected official.

Table 3

*Florida Agriculture organization members' agreement with select methods of communication from their organization(s) as motivating them to contact an elected official about an ANR issue*

Item	<i>M</i>	<i>SD</i>	Interpretation
Email Newsletter	3.82	.866	Agree
Printed Letter	3.53	.998	Agree
Phone Call	3.32	1.294	Neither agree nor disagree
Printed Magazine	3.22	1.022	Neither agree nor disagree
Text Message	3.13	1.242	Neither agree nor disagree
Social Media Posts	2.89	1.249	Neither agree nor disagree
Videos delivered via Social Media	2.82	1.218	Neither agree nor disagree
Webinars	2.58	1.093	Neither agree nor disagree

*Note:* Real Limits: 1.00 to 1.49 = *Disagree strongly*, 1.50 to 2.49 = *Disagree*, 2.50 to 3.49 = *Neither agree nor disagree*, 3.50 to 4.49 = *Agree*, 4.50 to 5.00 = *Agree strongly*

#### **Objective Four**

Objective four sought to describe the degree to which the type of impact resulting from ANR legislation would motivate Florida agriculture organization members to contact a local, state, or national elected official. Members in this study *agreed* with all statements pertaining to the types of impact that would motivate them to contact an elected official about an ANR policy. The statements with which members indicated the highest agreement were “I would contact a local, state, or national elected official about legislation that has a direct negative impact on me” ( $M = 4.44$ ;  $SD = .66$ ) and “I would contact a local, state, or national elected official about legislation that has a direct negative impact on my community” ( $M = 4.32$ ;  $SD = .66$ ). The statements with which members indicated the lowest agreement were “I would contact a local, state, or national elected official about legislation that has a direct negative impact on Florida farmers/ranchers” ( $M = 4.29$ ;  $SD = .69$ ) and “I would contact a local, state, or national elected official about legislation that has a direct negative impact on agriculture in Florida” ( $M = 4.27$ ;  $SD = .67$ ).

#### **Conclusions, Discussion, and Recommendations**

This study aimed to address the gaps in literature pertaining to agriculture organization members' communication preferences and motivation to contact elected officials about ANR policies. While the methods used do not allow the results to be generalized beyond the scope of the participants, the results from this study help provide insight into the communication

preferences and perceptions of this group of agricultural organization members that may hold implications for other agricultural groups. Regarding agriculture organization members' preferences for being communicated to by their organization(s) and perceived trustworthiness of information sources, the findings of this study revealed members most preferred to be communicated to via email or printed magazines. Members also identified information from local Extension offices and the university as the most trustworthy sources of information. Only two sources were identified as untrustworthy, including national network TV news and social media. A possible recommendation for future research is to conduct qualitative research to identify the "why" behind perceptions of trustworthiness and credibility regarding ANR information sources. Further, despite prior research supporting the growth of social media as an avenue information sharing and engagement (Kerpen, 2015), members in this study identified social media posts and videos as only moderately or slightly preferred. These methods were also found to neither motivate nor discourage members to communicate with elected officials about ANR policies or issues. Future research should be conducted to examine discrepancies between this study and others regarding social media as an effective means of communicating information to members of agricultural organizations. With a growing population and changing agriculture industry (American Farm Bureau Federation, 2018), effective communication with elected officials is imperative to the successful shaping of agricultural policy. As such, further research on the communication behaviors of elected officials and members of agriculture organizations may help provide a holistic picture of effective two-way engagement in communication between agriculture members and elected officials.

Policy in agriculture is created by elected officials and influenced, whether large or small, by agricultural lobbyists, agricultural and natural resource organizations, and ANR organization members (Shanley & Lopez, 2009). As such, this study sought to provide insight into how to motivate members of agricultural organizations to play an active role in ANR policy by contacting their elected officials. Respondents indicated email newsletters, printed letters, and phone calls to had the most influence when driving them to contact elected officials. This counteracts findings by Doerfert & Miller (2006), which indicated monthly newsletters and printed materials were not sufficient when meeting the information needs of agricultural audiences. Regarding the findings of this study, it should be noted that some differences were observed in members' preferred methods of being communicated to by their organizations and the types of communication they identified as motivating them to contact an elected official about an ANR policy. While phone calls were the least preferred methods of being communicated to by their organization(s), members identified email newsletters, printed letters, or phone calls as the types of communication from their organization(s) that would most motivate them to contact an elected official. As such, it is recommended leaders of agricultural organizations utilize different methods of communicating with their members depending on the purpose of the communication. Janse and Konijendijk (2007) noted the range of stakeholders with varying perspectives in agriculture and natural resources makes accomplishing a successful communication process among members complex and, therefore, advised the use of multiple communication methods.

While not directly within the scope of the findings of this study, one possible challenge faced by agricultural organizations is agricultural communications students' lack of preparedness to make phone calls. In a study conducted with agricultural communication professionals, Morgan (2010) found telephone skills were perceived as the least important communication competencies for graduates (Morgan, 2010). Considering the potential of phone calls to motivate agricultural organization members to contact elected officials, it could be beneficial for agricultural organizations to train their communications professionals to deliver effective phone calls and compete with other forms of messaging to ensure maximum information retention and encourage action (Mumby, 2012; Weick, 1979).

Whether communicating to share information or motivate members to contact elected officials, organizational leaders should still utilize the sources of information members perceived as most trustworthy to deliver effectively the necessary information. As members in this study indicated they would most likely contact an elected official about an ANR policy that had a direct, negative impact on them or their community, organizational leaders should also make efforts to share trustworthy information with members that highlights the personal and communal impacts of the ANR policy about which they want members to contact elected officials.

Future research should seek to further explore the findings of this study by quantifying the influence of communication methods on members' communication with elected officials. For example, it may be beneficial to examine the emails, newsletters, and phone calls delivered to agricultural organization members that spurred the highest click-rates, discussions, or results of contacting elected officials to provide insight to which forms of communication are given the most attention. Future research may also consider the influence of demographic characteristics on the targeted outcome of communicating with elected officials. Glass (2007) suggested different generations have different communication preferences. While this study did not analyze the influence of demographic characteristics on members' communication preferences, future research of such nature may provide insight into the current communication landscape of ANR organizations' members by demographic characteristics and key data on how to effectively disseminate messages using the most effective channels based on those characteristics.

Lastly, this area of research could benefit from qualitative inquiry. Further research should involve interviews or focus groups to understand why certain communication channels are preferred over others or why certain communication sources are perceived as trustworthy. Additional research should examine how often elected officials use each of the sources identified in this study.

## References

- Boehlje, M. (1999). Structural changes in the agricultural industries: How do we measure, analyze and understand them?. *American Journal of Agricultural Economics*, 81(5), 1028–1041. doi:10.2307/1244080

- Boone, K. M., Tucker, M., & McClaskey, J. M. (2002). What's the impact with congressional aides? A study of communication attitudes and behaviors. *Journal of Applied Communications*, 86(2), 17–44. doi:10.4148/1051-0834.2170
- Brossard, D., & Nisbet, M. C. (2007). Deference to scientific authority among a low information public: Understanding U.S. opinion on agricultural biotechnology. *International Journal of Public Opinion Research*, 19(1), 24–52. doi:10.1093/ijpor/edl003
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method*. Hoboken, NJ: John Wiley & Sons, Inc.
- Effland, A. B. (2000). U.S. farm policy: The first 200 years. *Agricultural Outlook*, 269, 21–25. Retrieved from <https://www.cabdirect.org/cabdirect/abstract/20001809068>
- Enns, K., Martin, M., & Spielmaker, D. (2016). Research priority 1: Public and policy maker understanding of agriculture and natural resources. In T. Roberts, A. Harder, & T. Brashears (Eds.), *American Association for Agricultural Education National Research Agenda 2016–2020* (pp.13–18). Retrieved from [http://aaaeonline.org/resources/Documents/AAAE\\_National\\_Research\\_Agenda\\_2016-2020.pdf](http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf)
- Funkhouser, G. R., & Parker, R. (1999). An action-based theory of persuasion in marketing. *Journal of Marketing Theory and Practice*, 7(3), 27–40. Retrieved from <http://www.jstor.org/stable/40469966>
- Gregrich, R. J. (2003). A note to researchers: Communicating science to policy makers and practitioners. *Journal of Substance Abuse Treatment*, 25, 233–237. doi:10.1016/S0740-5472(03)00120-X
- Grunig, J. E. (2008). Excellence theory in public relations. In W. Donsbach (Ed.), *The International Encyclopedia of Communication*. doi:10.1002/9781405186407.wbiece047
- Haveman, H. A. (1992). Between a rock and a hard place: Organizational change and performance under conditions of fundamental environmental transformation. *Administrative Science Quarterly*, 37(1), 48–75. doi:10.2307/2393533
- Hinkle, S., Fox-Cardamonde, L., Haseleu, J. A., Brown, R., & Irwin, L. (1996). Grassroots political action as an intergroup phenomenon. *Journal of Social Issues*, 52(1), 39–51. doi:10.1111/j.1540-4560.1996.tb01360.x
- Huffman, W. E., Rousu, M., Shogren, J. F., & Tegene, A. (2004). Who do consumers trust for information: The case of genetically modified foods? *American Journal of Agricultural Economics*, 86(5), 1222–1229. doi:10.1111/j.0002-9092.2004.00669.x
- Hunt, S. K. (2004). Theories of persuasion. In J. R. Baldwin, S. D. Perry, & M. A. Moffitt (Eds.), *Communication theories for everyday life* (pp. 138–155). Boston, MA: Pearson Education, Inc.

- Janse, G., & Konijnendijk, C. C. (2007). Communication between science, policy and citizens in public participation in urban forestry—Experiences from the Neighbourwoods project. *Urban Forestry & Urban Greening*, 6(1), 23–40. doi:10.1016/j.ufug.2006.09.005
- Jennings, P. D., & Greenwood, R. (2009). Constructing the iron cage: Institutional theory and enactment. In R. I. Westwood, & S. Clegg (Eds.), *Debating organization: Point-counterpoint in organization studies* (pp. 195–207). Malden, MA: Blackwell.
- Johnson, D. M., & Shoulders, C. W. (2017). Power of statistical tests used to address nonresponse error in the Journal of Agricultural Education. *Journal of Agricultural Education*, 58(1), 300–312. doi:10.5032/jae.2017.01300
- Kaufman, E. K., Israel, G. D., & Irani, T. A. (2008). Voter confidence in the agricultural industry. *Journal of Applied Communications*, 92(1), 31–55. doi:10.4148/1051-0834.1214
- Lamm, A. J. (2013). *Speaking with policymakers about current issues* (AEC489). Gainesville: UF/IFAS. Retrieved from <http://www.edis.ifas.ufl.edu>
- Lindner, J. R., Murphy, T. H., Briers, G. G. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43–53. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.507.7093&rep=rep1&type=pdf>
- Miller, L. E., & Smith, K. L. (1983). Handling nonresponse issues. *Journal of Extension*, 21, 45–50. Retrieved from <https://joe.org/joe/1983september/83-5-a7.pdf>
- Mills, J. H. (2003). *Making sense of organizational change*. London, UK: Routledge.
- Mumby, D. K. (2012). *Organizational communication: A critical approach*. Thousand Oaks, CA: SAGE Publications, Inc.
- Neher, W.W. (1997). *Organizational communication – Challenges of change, diversity, and continuity*. Boston, MA: Allyn and Bacon.
- Noble, E. L. (2006). *Sources of information utilized by California agricultural interest groups*. College Station, TX.: Texas A & M University.
- Salazar, V. K. (2015). *Communication among agricultural policy influencers: A delphi study (Unpublished master's thesis)*. Texas A&M University, College Station, TX.
- Settle, W., Rumble, J. N., McCarty, K., & Ruth, T. K. (2017). Public knowledge and trust of aricultural and natural resource organizations. *Journal of Applied Communications*, 101(2), 86–98. doi:10.4148/1051-0834.1007
- Shanley, P., & Lopez, C. (2009). Out of the loop: Why research rarely reaches policy makers and the public and what can be done. *Biotropica*, 41(5), 535–544. doi:10.1111/j.1744-7429.2009.00561.x
- Simon, H. A. (1957). *Administrative behavior*. New York, NY: Free Press.

- Florida Department of Agriculture and Consumer Services. (2018). *Florida agriculture overview and statistics*. Retrieved from <https://www.freshfromflorida.com/Agriculture-Industry/Florida-Agriculture-Overview-and-Statistics>
- Florida Farm Bureau. (2010). *History: Florida Farm Bureau*. Retrieved from <http://www.floridafarmbureau.org/history/>
- Florida Farm Bureau Federation. (2018). Retrieved from [www.floridafarmbureau.org](http://www.floridafarmbureau.org)
- Taylor, J. R., & Van Every, E. J. (2000). *The emergent organization: Communication as its site and surface*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Telg, R. W., Basford, A., & Irani, T. A. (2005). Communication preferences of politically active agricultural leaders. *Journal of Applied Communication, 89*(2), 7–14. doi:<https://doi.org/10.4148/1051-0834.1302>
- Weick, K. E. (1979). *The social psychology of organizing*. Reading, MA: Addison-Wesley
- Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science, 16*(4), 409–421. doi:10.1287/orsc.1050.0133
- Vickers, G. (1967). *Towards a sociology of management*. New York, NY: Basic Books.

## **Discussant Remarks**

### **Agriculture Organization Members' Communication Preferences and Motivation to Contact Elected Officials about Agriculture and Natural Resources Issues**

Discussant: Leslie D. Edgar, University of Georgia

#### **Summary of Article**

This manuscript addresses a significant issue related to communication preferences and motivation to contact elected officials. The conceptual framework of this article was based on Weick's (1979) Model of Organizing. However, the researchers modified the model to propose a comprehensive framework for examining agriculture organizations members' communication preferences and motivation to communicate with elected officials. This model is comprehensive and would serve as a good baseline for others interested in research focused on communication preferences and motivation. The methods used was survey research of multiple agriculture organization members. Appropriate sampling and collection criteria were followed. The conclusions had citations that should likely be updated (Doerfert & Miller (2006) and Janse & Konijendijk (2007)), but lead the reader to consider more deeply the "why" behind perceptions of trustworthiness and credibility beyond this research.

#### **Selected Questions for Discussion and Further Research or Future Practice**

- 1) Communication preference and motivation are important areas to consider as we work with organizations, commodity groups, and elected officials. What is your advice regarding how others can seek areas of collaboration with these important stakeholder groups?
- 2) Please speak to the acceptability/variability of your internal reliability scales, ranging from alpha level .52 to .90. As a discipline, where should we be with scale reliability?
- 3) It was exciting to see in your research both Extension and the University were listed as trustworthy sources. What can we do today to ensure that these entities remain sources of trustworthy information in the future, especially as demand to seek extramural funding increases?
- 4) As a discipline and within limited/reduced hours, how do we prepare our students with all the competencies they will need to be successful in their future professional careers?
- 5) As institutions of higher learning, how can we work together to use our expertise across departmental disciplinary areas (agricultural education, agricultural communication, agricultural leadership, extension education, international agriculture/development) to impact legislation and government funding beyond your study?
- 6) Additionally, and likely outside of this study, how can we work together to move our individual research agendas from department/college/state initiatives to regional/national/international initiatives that seek greater understanding and impact?

## **Developing Metrics for Predicting Student Motivation to Enroll in a Short-Term Study Abroad Course from an Expectancy-Value-Cost Perspective**

Brandon M. Raczkoski, Oklahoma State University  
J. Shane Robinson, Oklahoma State University  
M. Craig Edwards, Oklahoma State University  
Marshall A. Baker, North Carolina State University  
Sarah R. Gordon, Arkansas Tech University  
Ki L. Matlock-Cole, Oklahoma State University

### **Abstract**

*This study investigated the factor structure of the Perceived Costs of Studying Abroad Instrument (PCoSAI), adapted from the expectancy-value-cost model instrument, with exploratory factor analysis (EFA) from 1 independent sample of students who were enrolled in the College of Agricultural Sciences and Natural Resources (CASNR) at Oklahoma State University. The EFA sample consisted of 381 students who were assessed during an in-class recruitment event for international courses or experiences offered through CASNR in the 2017 Fall semester. There were approximately 113 male and 268 female students, and 118 had previously travel abroad at least once. The mean composite score for the sample varied from average to somewhat below average and evinced substantial differences among scores. The 4-factor solution was considered using principal axis factoring with Promax rotations. Selected extraction criteria and parameter estimates supported the 4-factor PCoSAI. Fourteen perceived costs items emerged from the EFA to form 4 perceived costs factors, explaining 81% of the variance. The four factors were moderately and substantially correlated with students' motivations to enroll in a short-term study abroad course. Cronbach's alpha scores for the four sub-scales ranged from .90 to .93.*

### **Introduction**

U.S. institutions of higher learning endeavor to provide educational opportunities for students to learn about complex issues such as identity, power, privilege, human rights, and culture (Doerr, 2013; Kuh, 2008). Modern teaching and learning practices suggest that high-impact experiences are useful for acquiring knowledge and beneficial for college students from diverse backgrounds (Kuh, 2008). As such, high-impact learning practices are fundamental for developing college student attributes that employers value (Starkey & Osler, 2001), especially those interested in agricultural sciences and related sectors. Such efforts, ultimately, prepare students for a globally connected and multicultural society (NAFSA, 2006). To these aims, the goal of the current research is to adapt a general perceived costs scale into the context of high-impact, international agricultural learning experiences for college students and encourage further adaptation of the same into specific domains of the agricultural education sphere.

Nearly 98% of the world population lives outside of the United States, and population projections suggest that is where a majority of future growth will occur (United Nations, 2017). Specifically, that growth represents a large potential market for U.S. agricultural products. Growing international markets for U.S. food, fiber, and natural resources exports will require a globally literate citizenry (Commission on the Future of Higher Education [CFHE], 2006). Providing future agricultural leaders, employees, business people, and educators, with

opportunities and skills with practical significance in the workplace and classroom is an imperative task if the United States is to remain competitive and function across a global economy (CFHE, 2006). Such efforts will support and inspire the next generation of agriculturally minded persons.

The Commission on the Abraham Lincoln Study Abroad Fellowship Program [CALSAFP] (2005) reflected a similar sentiment by stating, “what nations don’t know can hurt them. The stakes involved in study abroad are that simple, that straightforward, and that important. For their own future and that of the nation, college graduates today must be internationally competent” (p. iv). As international markets grow, U.S. agricultural producers will become increasingly reliant on skilled workers with expertise in international trade, cross-cultural communication, cultural competence, and global awareness (NAFSA, 2006). According to Kuh (2008), there exist a number of high-impact learning experiences, such as study abroad, educators can facilitate. In particular, diversity and global learning, including study abroad, offers students opportunities to explore and learn about cultures and worldviews different from their own (Kuh, 2008).

College often is the first time a student experiences the notion of diversity and global learning (American Council on Education [ACE], 2008). Despite the increased emphasis on education abroad participation, these efforts have translated little into enrollment growth (IIE, 2017). The increased enrollment patterns that do exist distribute unevenly among differing student populations (IIE, 2017). The documented benefits of study abroad, however, are vast. In fact, a number of U.S. institutions of higher education have adopted international strategic plans with the goal of having one-half of all undergraduate students participate in some type of international learning experience before graduation (Estes, Hansen, & Edgar, 2016). For faculty, administrators, and related agricultural professionals to encourage students to participate in high-impact learning experiences, it is important to use up-to-date psychometric tools to aid in identifying specific types of impediments that might prevent them from participating (Shultz, Whitney, & Zickar, 2014). These tools evolve constantly and are used to collect information regarding factors that may influence students’ decisions. For example, recent advances in motivation science offer a firsthand glimpse into the affective domain, an understudied area of psychology (Barron & Hulleman, 2015), and the perceived barriers students face when planning and making decisions (Flake, Barron, Hulleman, McCoach, & Welsh, 2015). To this end, it is important for students to challenge their schemata, or pattern of thought or behavior, especially if it helps them overcome perceived costs that might preclude their participation in high-impact learning experiences, such as study abroad courses or experiences.

### **Review of Cost Literature**

Researchers have revitalized their efforts to understand the effect of perceived costs in different academic domains and settings (Barron & Hulleman, 2015; Eccles & Wigfield, 2002; Flake et al., 2015; Raczkoski et al., 2018; Wigfield & Cambria, 2010). Yet in previous research, they often neglected or ignored altogether the costs dimension (Barron & Hulleman, 2015) of the expectancy-value theory (EVT). Recent motivation research into theories integrating expectancy and value, however, has focused on the forgotten or ignored EVT cost component. They suggested that cost is a critical component value and such conceptions include the negative aspect of engaging in a task. Wigfield and Cambria (2010) proposed that researchers should

investigate the understudied cost factor more deeply. As a result, a surge in the number of research studies focused on expanding the definition of cost and developing better ways for its measurement in various academic settings occurred (Barron & Hulleman, 2015; Flake et al., 2015; Raczkoski et al., 2018).

Eccles (2005) defined cost as the amount of effort exerted and what is lost or foregone because of task completion. Researchers, initially, introduced cost as a mediator and believed it affected subjective task value. However, researchers' understanding of the notion of cost resulted in a growing body of literature and, over time, conceptions of such changed. The first attempt to measure cost began in a 1980 report generated by Eccles under her given name (see Parsons et al., 1980; as cited in Flake et al., 2015). Eccles et al. (1983) described cost as a factor that might affect individuals' achievement-related choices and performance. They concluded that cost demotivates students from participating in certain academic tasks. In other words, researchers conceived that cost subtracted negatively from the overall value a student placed on a task. Moreover, researchers have posited that motivation for academic subjects deteriorates during the course of an academic experience (Barron & Hulleman, 2015; Eccles et al., 1983; Wigfield, Tonks, & Klauda, 2009), therefore, highlighting the importance of early-targeted interventions, such as the application and use of a perceived costs scale to identify barriers that might preclude participation in short, term study abroad courses or experiences.

Later, Eccles and Wigfield (1995) revisited the measurement properties of the scale. Their work provided psychometric evidence of three task value factors, i.e., interest, attainment, and utility, referred to globally as *subjective task value*, a combined expectancy/ability-related beliefs factor, and task difficulty factors, i.e., difficulty and effort. However, this research included no direct measure of cost. This inspired Wigfield and Eccles (2000) to expand their definition of psychological cost to include anxiety and affective perceptions of task engagement. As a result, psychological cost was renamed *emotional cost*. Other researchers have even developed psychometric measures of students' perceptions of cost (Battle & Wigfield, 2003; Conley, 2012; Perez, Cromley, & Kaplan, 2014; Trautwein et al., 2012). Overall, their findings provided empirical evidence that the three sub-dimensions of cost differed from the components of task value. However, no clear consensus emerged regarding how to measure cost (Flake et al., 2015).

### **Expectancy-Value-Cost Instrument**

Flake et al (2015) expanded upon previous measures of cost and developed the most comprehensive measure of such to date. When developing the expectancy-value-cost instrument, they conducted several focus group interviews with college students to determine the perceived costs related to coursework. Their efforts resulted in the development of a 19-item scale that built on previous research on cost. Flake and colleagues (2015) confirmed their cost scale using exploratory and confirmatory factor analyses. The researchers found that cost was separate from expectation for success and subjective task value. In addition, they provided evidence for an additional cost sub-dimension. Their work led to the development of a 19-item cost scale, which included four theorized sub-dimensions of cost. The empirical research supporting the new cost

sub-factor, called *outside effort cost*, relates to the amount of time, effort, and resources put forth for tasks other than the task of interest (Flake et al., 2015).

Although a few instruments helpful in identifying students' perceived barriers have been developed recently, these instruments do not measure perceived costs in the context of short-term, study abroad course or experience participation. Therefore, a need remains for the development of an empirically based instrument that measures students' cost perceptions that have been identified as being related to achievement and potential interventions to determine how internal cognitive dynamics influence their choices to study abroad. Data collected with such a measurement tool can support and inform faculty, administrators, and other agricultural professionals to inspire change in students and make meaningful contributions to developing a globally educated citizenry. It is likely that high-impact learning experiences for students, such as study abroad, can inspire the next generation of agricultural professionals to explore worldviews different from their own (Kuh, 2008). The cumulative effect is a globally educated citizenry, a strengthened national security, and an improved society. The present study describes the development of the Perceived Costs of Studying Abroad Instrument (PCoSAI) including item development and an exploratory factor analysis. This study aligns with Research Priority 4: Meaningful, Engaged Learning in All Environments (Roberts, Harder, & Brashears, 2016).

### **Objectives**

This study's purpose was to articulate the development of the Perceived Costs of Studying Abroad Instrument. The instrument was adapted from its original version to measure perceived costs identified as most critical for long-term achievement-related choices and performance that are experienced typically by college-age students regarding their decisions to enroll in a short-term study abroad course. Four objectives were used to guide the development process.

1. Examine the fit of a four-factor EVC model;
2. Estimate lower-order factor reliability scores;
3. Describe the descriptive statistics of the set of items that measured perceived costs; and
4. Describe and interpret the correlations between perceived costs.

### **Population**

The population of interest was freshmen students who enroll in the College of Agricultural Sciences and Natural Resources (CASNR) at Oklahoma State University (OSU). Incoming freshmen within CASNR are required to complete the Freshman Orientation (AG 1011) course to satisfy their undergraduate degree program requirements. Students from all seven sections ( $N = 566$ ) of the AG 1011 course were chosen to acquire a representative sample of students who enroll in the course over time (Oliver & Hinkle, 1982). Four hundred and thirty-nine students completed IRB consent forms and participated in the study for a 77.5% response rate. After excluding incomplete questionnaires, the sample size was reduced to 381 (67.3%). Non-response error was handled by comparing selected characteristics requested from the students to the population of students over time (Institutional Research and Information

Management [IRIM], 2018). Differences in gender were non-significant, meaning that the gender of the study’s participants did not differ from the population.

### Participant Description

Descriptive statistics of the sample were obtained through the questionnaire administered. Freshmen students (113 males; 268 females) were recruited from seven sections of the AG 1011 course offered by the CASNR at OSU University during the Fall 2017 semester. Students self-reported first generation status (87 first-generation college students; 294 non-first-generation college students) and previous international experience (118 with previous international experience; 263 without previous international experience). Table 1 illustrates gender, first generation status, and previous international experience for freshmen enrolled in the AG1011 course during the Fall 2017 semester.

Table 1

*Selected Student Characteristics (N = 381)*

Characteristic	Category	<i>f</i>	(%)
Gender	Male	113	30.0%
	Female	268	70.0%
	Other	0	0.0%
Status	First generation college student	87	23.0%
	Not a first generation college student	294	77.0%
Experience abroad	Previous experience abroad	118	31.0%
	No experience abroad	263	69.0%

*Note.* Respondents did not select the *Other* option.

### Method and Procedure

The procedure began with designing the study and submission of the OSU IRB application. The Board approved the research protocol. The consent of CASNR’s international programs coordinator and interim assistant dean of academic programs followed the approved protocol. Their permission was necessary to gain access and approval to administer the questionnaire to AG 1011 students. Students who did not want to participate in the research study were given an opportunity to earn extra credit points by completing an alternative assignment. None of the students chose to complete the alternative assignment option. An informed consent sheet accompanied each questionnaire. The form explained the benefits and risks of participating in the research study. Students understood their participation was voluntary and anonymous. Students reported their name and email address when submitting their questionnaire and received 10 extra credit points in AG 1011 for their participation. Data

collection occurred at the beginning of September and lasted approximately one week. The AG 1011 course is an introductory course for all majors in CASNR and is hosted on OSU's main campus in Stillwater. The entire course was chosen to assess a representative sample of a typical, entering freshman class in CASNR.

### **Sampling Procedure**

To ensure adequate coverage of this *time and place* sample (Oliver & Hinkle, 1982), all students who enrolled in AG1011 during the Fall 2017 semester were invited to participate. Data were compared by college, classification, and gender over the last ten years (IRIM, 2018). Through this comparison, no statistically significant differences were detected. Therefore, students who were enrolled in the course were a representative sample of the population of all freshmen students who enroll in AG 1011 over time. According to Oliver and Hinkle (1982), “[s]uch an assumption permits the use of inferential statistics and, if made, must be defended by the researcher as being reasonable” (p. 200). For these reasons, the researcher determined that a *time and place* sample methodology (Oliver & Hinkle, 1982) was appropriate.

### **Instrumentation**

The Perceived Costs of Studying Abroad Instrument was used in this study (Flake et al., 2015; Raczkoski et al., 2018). The questionnaire contained 29 items divided into three sections: Section One assessed students' intent and motivation regarding short-term study abroad courses or experiences; Section Two assessed students' conceptions about perceived cost, i.e., outside effort, task effort, loss of valued alternatives, and emotional cost, regarding study abroad participation; and Section Three requested information about students' personal characteristics. Because motivation implies some future psychological state or idealized self-image or projection, item stems for the cost subscales were written in future tense so that students could account for some future state of perceived cost as opposed to a real-time appraisal. Motivation is the antecedent or expectation of committing to a future task or behavior; therefore, forecasted perceived costs factors were compared to the future state of being motivated. Both future tense and motivation implied an affective state to come.

**Study Abroad Motivation.** Three items measured agricultural students' motivation and intent to study abroad. Participants rated these statements on a 5-point, Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The average of the three items formed a composite mean score. This continuous variable represented students' motivation to study abroad. Cronbach's alpha reliability estimate revealed a value of .94. The following limits were used to categorize students' mean motivation scores: participants who responded 1 or 2 were categorized as the *unmotivated* group; participants who responded 3 were categorized as the *no preference* group; and participants who answered 4 or 5 were categorized as the *motivated* group.

**Perceived Costs.** Raczkoski et al.'s (2018) PCoSAI measured students' perceived costs factors. The scale adapted items from Flake et al.'s (2015) EVC measure to the context of short-term study abroad course or experience participation. The 20-item scale was rated on a 5-point, Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The average of the items that clustered together formed composite mean scores for each of the factors. The scale has

not been used widely in previous research; however, it follows closely Flake et al.'s (2015) definition of perceived cost, including its theorized four sub-dimensions. Reliability analysis using Cronbach's alpha correlation verified the subscales in the modified version by Raczkoski et al. (2018) to be reliable ( $\alpha > .80$ ).

***Emotional cost.*** The 5-item Emotional Cost measure assessed the psychological or emotional facet of short-term study abroad learning experience participation. Higher scores indicated students' perceptions of more emotional cost. The internal consistency of this measure was .94 on the original Flake et al. (2015) scale and .85 on the modified scale by Raczkoski et al. (2018).

***Outside effort cost.*** The 5-item outside effort cost sub-scale assessed the students' conceptions about the time and effort devoted to tasks other than in the participation in a short-term study abroad course or experience. Reliability analysis for this sub-scale reported a Cronbach's alpha score of .93 on the original Flake et al. (2015) scale and .89 on the modified scale by Raczkoski et al. (2018). The higher the score on this 5-item sub-scale, the more apprehension students had about future time and effort devoted to tasks other than studying abroad.

***Loss of valued alternatives cost.*** The 5-item Loss of Valued Alternatives (opportunity cost) sub-scale was a measure of what is lost, given up, or sacrificed because of short-term study abroad course or experience participation. Reliability analysis for this sub-scale reported a Cronbach's alpha score of .89 on the original Flake et al. (2015) scale and .86 on the modified scale by Raczkoski et al. (2018). Higher scores indicated greater perceived loss of valued alternatives cost.

***Task effort cost.*** The 5-item Task Effort Cost sub-scale assessed students' perceptions about the amount of mental or physical effort they expected to exert as a result of participation. Higher scores indicated the perceived need for more effort toward participation. The internal consistency of this measure was .95 on the original Flake et al. (2015) scale and .86 on the modified scale by Raczkoski et al. (2018).

### **Instrument Pilot Study**

An expert panel reviewed the PCoSAI for content and face validity during the Fall 2016 semester. The panel included faculty in CASNR at OSU. Faculty panel members were considered experts in research methods, psychometrics, and international agricultural education. In the pilot study, items were presented online using Qualtrics Survey Software in random order, with a 5-point Likert-type rating scale: 1 = *completely disagree*, 3 = *either agree nor disagree*, and 5 = *completely agree*. The convenience sample included 219 CASNR students, 70.3% female (0.9% did not indicate gender), with an average age of 21.5 years ( $SD = 5.4$ , 6.4% did not indicate age). The ethnic breakdown of participants was as follows: White (73.5%), Native American/Alaskan Native (12.8%), International (9.1%), Black (5.5%), Hispanic (5.0%), and Asian American (2.3%).

### **Data Analysis**

Data were analyzed using the Statistical Program for Social Sciences (SPSS) Version 21, by which descriptive statistics, exploratory factor analysis procedures, and standard multiple regression were implemented. A principal axis factoring method of extraction and Promax rotation were used to identify the underlying factor structure of the adapted PCoSAI, specifically the 20 items intended to measure perceived costs of outside effort, task effort, loss of valued alternatives, and emotional costs. Researchers used a Promax rotation because in the social sciences a correlation among factors is generally expected (Costello & Osborne, 2005). Kaiser's criteria and a Scree Plot were used to determine the number of factors to extract (Costello & Osborne, 2005).

The factor loadings presented in the pattern matrix were used to determine which items to retain or remove from subsequent analyses. Factors with fewer than three factor loadings ( $\leq .50$ ) were considered to be weak or unstable (Costello & Osborne, 2005). The sample size used in this study exceeded the recommend item ratio of 10:1 for an instrument with 20 items. Internal reliability was established 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 examined closely, both conceptually and theoretically, to determine their suitability and interpretability for inclusion within the underlying factor structure (Beavers et al., 2013; Fabrigar, Wegener, MacCallum, & Strahan, 1999).

## Results

This investigation began with an exploratory factor analysis (EFA) for the instruments' items using principal axis factoring (PAF) to evaluate the underlying dimensionality of the scale within this population (Shultz et al., 2014). PAF also 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  $1.494E - 10$ , which indicated no multicollinearity, and EFA of the dataset was feasible. The Kaiser-Meyer-Olkin Test of Sampling Adequacy (KMO) was .973, 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 ( $p < .000$ ). Therefore, it was concluded that EFA was useful for detecting the underlying factor structure of the 20 items in the adapted EVC scale.

### Fit of a Four-Factor EVC Model

Before extraction, SPSS identified 20 factors within the data set. Eigenvalues associated with each factor represented the percentage of variance explained by each factor. The first few factors explained relatively large amounts of variance. The four factors with eigenvalues greater than 1 were extracted. Before rotation, Factor 1 accounted for considerably more variance than the remaining three factors. According to Field (2013), Kaiser's criterion is accurate when there are fewer than 30 variables, communalities are greater than .7, or when the sample size exceeds 250 and the average communality is greater than .6. All of the communalities exceeded .7. Together, these criteria suggested Kaiser's rule was appropriate for these data.

The scree plot indicated one point of inflection at four factors. Therefore, four factors were extracted. The four extracted factors explained 81% of the variance prior to rotation of the factors: emotional cost (68.9%), outside effort cost (6.2%), loss of valued alternatives cost (3.4%), and task effort cost (2.6%). Factors were obliquely rotated using Promax rotation. Each factor had at least three items with loadings that were .50 or larger (Costello & Osbourne, 2005). Five items had cross-loadings, i.e., factor loadings > .32, on two factors: item TE4, item EM5, item LOVA1, item TE5, and item TE1. Cross-loaded items deemed to be problematic were removed one at a time. The EFA was re-run after each time an item was removed, and the emergent factor structure was re-examined without the presence of the problematic item. This process was repeated until an approximate simple structure was achieved (Sass & Schmitt, 2010) that met the extraction criteria. The factors loaded as anticipated, to a degree. A reduction in the total number of items occurred and the factors were renamed as a results of the analysis. Item loadings are presented in Table 2.

Table 2

*Final Factor Loadings for Exploratory Factor Analysis with Promax Rotation of Perceived Cost Sub-Scales (N = 381)*

Item	Emotional Cost	Outside Effort Cost	Loss of Valued Alternatives Cost	Task Effort Cost
EM1	.874			
EM3	.827			
EM6	.799			
OE5		.870		
OE2		.668		
OE4		.601		
OE3		.597		
LOVA2			.786	
LOVA5			.741	
LOVA4			.733	
LOVA3			.699	
TE2				.744
TE5				.736
TE3				.735

*Note.* Factor loadings < .32 were suppressed. LOVA = Loss of Valued Alternatives; OE = Outside Effort Cost; EM = Emotional Cost; TE = Task Effort Cost. Principal Axis Factoring

w/Promax Rotation and 81% variance explained. Scale: 1 = *Strongly disagree*; 2 = *Somewhat disagree*; 3 = *Neither agree nor disagree*; 4 = *Somewhat agree*; 5 = *Strongly agree*.

**Lower Order Factor Reliabilities**

Reliability coefficients were computed using Cronbach’s alpha scores ( $N = 381$ ). The four emergent factors had reliability coefficients greater than .70, which were considered acceptable (Nunnally, 1978). The reliability estimates for each cost factor were: EM = .91 (three items); OE = .90 (four items); LOVA = .93 (four items); and TE = .93 (three items). Items from each sub-scale, i.e., emotional cost, outside effort cost, loss of valued alternatives and task effort cost, were averaged together to create an observed mean score for each construct.

**Descriptive Statistics of the Set of Items that Measured Perceived Costs**

Item analysis revealed issues with normality. However, the factor analysis method used, principal axis factoring, does not rely on normally distributed data (Costello & Osbourne, 2005). Mean scores ranged from 2.18 to 3.00. Students consistently indicated higher agreement with items from outside effort and LOVA perceived cost subscales. Students expressed a moderate level of disagreement with most of the items. Items OE5 ( $M = 3.00$ ;  $SD = 1.09$ ) and TE5 ( $M = 2.18$ ;  $SD = 1.05$ ) were the highest and lowest appraisals of perceived costs reported by the participants, respectively. Table 3 shows the means and standard deviations among 14 perceived costs items.

Table 3

*Descriptive Statistics for 14 Perceived Costs related to Students’ Motivations to Enroll in a Short-Term Study Abroad Course or Experience before Graduation*

Item	Perceived Cost	<i>M</i>	<i>SD</i>
EM1	I will worry too much about a study abroad course or experience.	2.36	1.16
EM3	A study abroad course or experience will be emotionally draining.	2.33	1.15
EM6	Considering a study abroad course or experience makes me feel too anxious.	2.37	1.17
OE5	I will be so busy with other courses or experiences that I will not have the time for a study abroad course or experience.	3.00	1.09
OE2	Because of all the other demands on my time, I will not be able to enroll in a study abroad course or experience.	2.56	1.15
OE4	Because of other things I do, I will not have time to put into a abroad course or experience.	2.65	1.19
OE3	I will have so many responsibilities that I am unable to put forth the effort that is necessary for a study abroad course or experience.	2.68	1.14
LOVA2	A study abroad course or experience will require me to give up too many other activities I value.	2.55	1.20

LOVA5	A study abroad course or experience will prevent me from spending time doing other things I like.	2.63	1.15
LOVA4	I will not spend as much time doing the other things that I would like because of a study abroad course or experience.	2.54	1.16
LOVA3	Taking a study abroad course will cause me to miss out on too many other things I care about.	2.60	1.16
TE2	I will have to put too much energy into a study abroad course or experience.	2.29	1.10
TE5	A study abroad course or experience will require too much effort.	2.18	1.05
TE3	A study abroad course or experience will be too long.	2.26	1.15

*Note.* A higher score indicated more agreement to the item. Scale: 1 = *Strongly disagree*; 2 = *Somewhat disagree*; 3 = *Neither agree nor disagree*; 4 = *Somewhat agree*; 5 = *Strongly agree*. LOVA = Loss of Valued Alternatives; OE = Outside Effort Cost; EM = Emotional Cost; TE = Task Effort Cost

### Correlations between Cost Variables

Statistically significant relationships ( $p < .01$ ) were found between four perceived costs composite scores. For example, statistically significant positive, very strong correlation coefficients were reported between emotional cost with outside effort cost ( $r = .67$ ), LOVA ( $r = .70$ ), and task effort cost measures ( $r = .79$ ). Table 4 displays the correlation coefficients among the sub-dimensions of cost. The four factors had fairly large correlations, which suggested the constructs measured were interrelated (Field, 2013).

Table 4

*Correlation Coefficients Among Perceived Cost Sub-Scales (N = 381)*

Cost Sub-Scale	1	2	3	4
1. Emotional cost	-			
2. Outside effort cost	.67**	-		
3. LOVA <sup>a</sup>	.70**	.83**	-	
4. Task effort cost	.79**	.71**	.78**	-

*Note.* Magnitude:  $.01 \geq r \geq .09$  = Negligible,  $.10 \geq r \geq .29$  = Low,  $.30 \geq r \geq .49$  = Moderate,  $.50 \geq r \geq .69$  = Substantial,  $r \geq .70$  = Very Strong (Davis, 1971). LOVA<sup>a</sup> = Loss of Valued Alternatives  
\*\*  $p > .01$ .

### Discussion

The results of this study suggest that the PCoSAI could be a potentially useful self-report tool for measuring students' perceived costs of short-term study abroad course or experience participation. The absence of valid and reliable instruments that measure perceived costs associated with such participation is a limitation in short-term study abroad research. The PCoSAI has the potential for use as a rapid assessment tool for identifying students' largest

affective barriers to participation and as an evaluation instrument to measure the impact of international experiences on perceived costs. The factor structure of the PCoSAI is consistent with a decade of education research regarding cost (Barron & Hulleman, 2015; Battle & Wigfield, 2003; Conley, 2012; Flake et al., 2015; Perez et al., 2014; Shultz et al., 2014; Trautwein et al., 2012). Four factors explained 81% of the variance in agricultural students' motivations to enroll in a short-term study abroad course. Reliability estimates indicate strong and reliable sub-scales ( $\alpha > .70$ ). Regarding the PCoSAI factors, *Study Abroad Emotional Cost*, relates closely to negative appraisals of a psychological state resulting from exerting effort. *Study Abroad Outside Effort Cost* relates closely to negative appraisals of the amount of time and effort exerted for tasks. *Study Abroad Loss of Valued Alternatives Cost* relates closely to negative appraisals of what is lost or given up. *Study Abroad Task Effort Cost* relates closely to negative appraisals of the amount of effort exerted. The findings of this study are encouraging in that they appear consistent with previous empirical research.

With additional research, the instrument employed in this study can be used by course administrators, faculty, and coordinators/directors of international programs as a tool for planning, promoting, and recruiting students for short-term study abroad courses. The tool can help create programs and shape advising efforts in at least two ways: 1) it can provide guidance on how to develop targeted interventions to help students overcome perceived costs so additional students participate, and 2) it can identify students early in their college career who have a desire to study abroad, so they can connect with faculty and begin preparing for the experience.

The PCoSAI is beneficial because it can be administered during class time, contains only 14 items, and takes students only a few minutes to complete. Data collected with the PCoSAI can help course administrators, faculty, and coordinators/directors of international programs monitor changes in affective perceptions of cost following educational interventions, identify specific types of perceived costs influencing academic-related choices and performance, and increase knowledge regarding factors that affect students' decisions to participate in short-term study abroad courses. The PCoSAI data potentially can identify motivational differences between groups, such as students with and without previous international experience and gender, and identify opportunities to develop educational interventions for each of them. Analysis of PCoSAI data could lead to the revision of international strategic planning goals and discussions between study abroad recruiters and administrators regarding program improvement. Finally, it might be useful to share with students their results on the PCoSAI to understand the drivers of behavior and perhaps change their attitude and knowledge regarding the matter. In addition, the PCoSAI could be used as a pre- and posttest measure in conjunction with short-term study abroad experiences to demonstrate how such international learning experiences can impact students' academic achievement-related choices and performance.

To determine the utility of the PCoSAI, a confirmatory factor analysis should be performed with another independent sample from a similar population to test the factor structure. This will be useful for determining whether the instrument performs across different populations and how adapting the scale from its original version affects its psychometric characteristics. Thus, an additional study is warranted. It is also possible the current form of the instrument affected readability due to items being worded in future tense. A large percentage of freshmen indicated intentions to study abroad. The time lag between intent and action presents a

significant substantial challenge on how to promote study abroad opportunities to college students. Researchers have argued the longer the time lag, the weaker the connection between intent and action becomes (Chintagunta & Lee, 2012; Sheeran & Webb, 2016). We attempted to control for this time lag by asking students about their motivation in the future tense. Subsequent studies should be mindful of the effect of future tense on students' responses.

## References

- American Council on Education. (2008). *College-bound students' interests in study abroad and other international learning activities*. Author. Retrieved from <http://www.acenet.edu/news-room/Documents/2008-Student-Poll.pdf>
- Barron, K. E., & Hulleman, C. S. (2015). Expectancy-value-cost model of motivation. *Psychology, 84*, 261–271. Retrieved from [https://www.researchgate.net/profile/Chris\\_Hulleman/publication/265965932\\_Expectancy-Value-Cost\\_Model\\_of\\_Motivation/links/542214600cf26120b7a010a8.pdf](https://www.researchgate.net/profile/Chris_Hulleman/publication/265965932_Expectancy-Value-Cost_Model_of_Motivation/links/542214600cf26120b7a010a8.pdf)
- Battle, A., & Wigfield, A. (2003). College women's value orientations toward family, career, and graduate school. *Journal of Vocational Behavior, 62*(1), 56–75. doi:10.1016/S0001-8791(02)00037-4
- 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>
- Chintagunta, P. K., & Lee, J. (2012). A pre-diffusion growth model of intentions and purchase. *Journal of the Academy of Marketing Science, 40*(1), 137–154. doi:10.1007/s11747-011-0273-2
- Commission on the Abraham Lincoln Study Abroad Fellowship Program [CALSAFP]. (2005). *Global competence and national needs: One million Americans studying abroad*. Retrieved from [http://www.nafsa.org/uploadedFiles/NAFSA\\_Home/Resource\\_Library\\_Assets/CCB/lincoln\\_commission\\_report\(1\).pdf?n=6097](http://www.nafsa.org/uploadedFiles/NAFSA_Home/Resource_Library_Assets/CCB/lincoln_commission_report(1).pdf?n=6097)
- Commission on the Future of Higher Education [CFHE]. (2006). *A test of leadership: Charting the future of U.S. higher education*. Retrieved from <https://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf>
- Conley, A. M. (2012). Patterns of motivation beliefs: Combining achievement goal and expectancy-value perspectives. *Journal of Educational Psychology, 104*(1), 32–47. doi:10.1037/a0026042.
- 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>

- Davis, J. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice Hall.
- 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. (2005). Subjective task value and the Eccles et al. model of achievement-related choices. In A. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 105–121). Retrieved from <http://www.rcgd.isr.umich.edu/garp/articles/eccles05d.pdf>
- 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.
- Eccles, J. S., & Wigfield, A. (1995). In the mind of the actor: The structure of adolescents' achievement task values and expectancy-related beliefs. *Personality and Social Psychology Bulletin*, 21(3), 215–225. doi:10.1177/0146167295213003
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53(1), 109–132. doi:10.1146/annurev.psych.53.100901.135153
- Estes, S., Hansen, M. J., & Edgar, L. D. (2016). University student and faculty needs, barriers, and expectations of international efforts and opportunities: A closer look at one land-grant university's college of agriculture. *Journal of International Agricultural & Extension Education*, 23(1). doi:10.5191/jiaee.2016.23103
- 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
- Institute of International Education. (2017). *Open doors 2017 fast facts*. Author. Retrieved from <http://www.iie.org/Researchand-Publications/~media/Files/Corporate/Open-Doors/Fast-Facts/Fast%20Facts%202017.ashx>
- Oklahoma State University. (2018). *Institutional research and information management: Student profile*. Stillwater, OK: Oklahoma State University. Retrieved from <https://irim.oklahoma.edu/SPdownload#2017>
- Kuh, G. D. (2008). *High impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.

- North Association of Foreign Student Advisors [NAFSA]. (2006). *International education experiences help prepare global-ready graduates for the twenty-first century workplace*. Retrieved from [https://www.nafsa.org/\\_/File/\\_/global\\_workers\\_inted\\_2006.pdf](https://www.nafsa.org/_/File/_/global_workers_inted_2006.pdf)
- Oliver, J. D., & Hinkle, D. E. (1982). Occupational education research: Selecting statistical procedures. *Journal of Studies in Technical Careers*, 4(3), 199-208. Retrieved from <https://eric.ed.gov/?id=EJ262812>
- Perez, T., Cromley, J. G., & Kaplan, A. (2014). The role of identify development, values, and costs in college STEM retention. *Journal of Educational Psychology*, 106(1), 315–329. doi:10.1037/a0034027
- Raczkoski, B. M., Robinson, J. S., Edwards, M. C., & Baker, M. A. (2018). Forecasting college students' motivations to study abroad: A pilot study. *Journal of Agricultural Education*, 59(2), 123–142. doi:10.5032/jae.2018.02123
- 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.
- Sheeran, P., & Webb, T. L. (2016). The intention–behavior gap. *Social and Personality Psychology Compass*, 10(9), 503–518. doi:10.1111/spc3.12265
- Shultz, K. S., Whitney, D. J., & Zickar, M. J. (2013). *Measurement theory in action: Case studies and exercises*. New York, NY: Taylor & Francis.
- Teichler, U., & Janson, K. (2007). The professional value of temporary study in another European country: Employment and work of former ERASMUS students, *Journal of Studies in International Education*, 11(3-4), 486–495. Retrieved from <http://jsi.sagepub.com/content/11/3-4/486.full.pdf>
- Trautwein, U., Marsh, H. W., Nagengast, B., Lüdtke, O., Nagy, G., & Jonkmann, K. (2012). Probing for the multiplicative term in modern expectancy–value theory: A latent interaction modeling study. *Journal of Educational Psychology*, 104(3), 763–777. doi:10.1037/a0027470
- United Nations. (2017). *Population*. Author. Retrieved from <http://www.un.org/en/sections/issues-depth/population/index.html>
- Wigfield, A., & Cambria, J. (2010). Students' achievement values, goal orientations, and interest: Definitions, development, and relations to achievement outcomes. *Developmental Review*, 30, 1–35. doi:10.1016/j.dr.2009.12.001
- Wigfield, A., & Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. *Contemporary Educational Psychology*, 25(1), 68–81. doi:10.1006/ceps.1999.1015
- Wigfield, A., Tonks, S., & Klauda, S. L. (2009). Expectancy-value theory. In K. Wentzel & A.

Wigfield (Eds.), *Handbook of Motivation at School* (pp. 55–75). New York, NY: Routledge.

**No Discussant Remarks**

# The Ugly Truth of Student-Teacher (Dis)engagement: An Autoethnographic Account

Ashley M. Yopp, University of Georgia  
Billy R. McKim, Texas A&M University  
Yvonna S. Lincoln, Texas A&M University

## Abstract

*A lack of engagement has been reported to contribute to an ever-widening gap between how students develop knowledge, skills, and abilities and how teachers provide instruction. At the onset of this study, the purpose was to understand how depth and sequence of experience influenced student engagement, yet an emergent etic perspective emerged. Data were collected from hundreds of hours of student interviews and observations, student and teacher reflexive journals, and classroom dialogue. Results of this study included a personal autoethnographic narrative describing the complex and unforeseen realities of (dis)engagement experienced by teachers and students. At the conclusion, it was evident the scope of the study needed to be expanded to not only describe the influence of how depth and sequence of experience engaged and, in some cases, disengaged students and teachers alike, but also the role meaningful connection plays in teaching in high stakes learning environments.*

## Introduction

Engaged students are more motivated to learn, but understanding how to engage students is a complex task (Coates, 2007). Teaching and learning are not mutually exclusive. The ability of a teacher to engage students is met with an unlimited number of extraneous variables and ever-changing policies that continuously disrupt their daily approach. Issues of student engagement become more difficult in high-stakes educational settings. According to Heubert and Hauser (1999), the context and standards of high-stakes environments have unintended consequences that discourage teachers from improving instruction to engage students. Additionally, teachers in high-stakes environments exhibit more controlling behaviors and are less likely to use practices that support student engagement, including exploration and experimentation (Sheldon & Biddle, 1998; Bain, 2004).

The challenges of teaching today's student require teachers to adapt to a new reality that is far from the classroom many educators experienced as students. Priority 4 of the *American Association for Agricultural Education National Research Agenda* (Edgar, Retallick, & Jones, 2016) included the need to understand "meaningful, engaged, learning opportunities is paramount to future learning environments," signaling a "paradigm shift" in the way teachers prepare students for the 21st century (pg. 38). However, perceptions that foster ideas of "edutainment" and quick fixes to student engagement only create misrepresentations of the problems teachers are facing in their classrooms (Sorathia & Servidio, 2012). Teaching, without renewed perspective of learning, may create an ever-widening gap between how students develop knowledge, skills, and abilities and how teachers provide instruction.

The complex web of perspectives, approaches, and settings presents the need to understand student and teacher engagement at a basic level. Bain (2004) suggested “the best teaching cannot be found in particular practices... but in the attitudes of teachers, in their faith in students’ abilities to achieve, in their willingness to take students seriously, and let them assume control of their own learning” (p. 78-79). Although research has contributed to varied components of teaching and learning individually, a collective and reciprocal understanding could illustrate possible opportunities for teachers *and* students to engage in any learning environment – including all five disciplinary areas of our profession (agricultural communications, agricultural leadership, school-based agricultural education, extension and outreach education, and agricultural education in university and post-secondary settings).

### *What is student engagement?*

Engaged learning practices used to develop students into in-depth learners, instead of passive receptors, have been essential components of educational theory for years (Johnson, Johnson, & Smith, 2001; National Research Council, 2009). Drawing on constructivism, engaged learning requires students to construct knowledge with their own experiences instead of accepting the experiences of an all-knowing teacher (Piaget, 1976). In higher education, Chickering and Gamson (1987) provided a set of principles for practice to engage undergraduates in learning; these principles include student-faculty interaction, student cooperation and reciprocity, and active learning.

Developing a specific definition of student engagement has become increasingly important as researchers and administrators work toward practices to improve student performance. Krause and Coates (2008) defined student engagement as “the extent to which students are engaging in activities that higher education research has shown to be linked with high-quality learning outcomes” (p. 493). Similarly, Hu and Kuh (2001) defined engagement as “the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes” (p. 3). Harper and Quaye (2009) argued engagement was a more complex matter that required more than an understanding of time and effort. In their view, involvement without feeling engaged was simply compliance; students must feel an emotional connection to make meaning of their experience.

### *What are the benefits of engaging students and teachers?*

Dewey (1938) defined the most powerful learning experiences as those that engaged the human mind in meaning-making. Dewey believed the most educative learning experiences allowed learners to solve problems and build understandings through interaction with the world around them. Although students were the primary concern of most researchers in the literature, Magolda (2005) contended they’re not the only ones to benefit from increased engagement in the learning process. The reciprocal environment constructed to engage learners fosters increased teacher engagement as well (Magolda, 2005). Although the literature is rarely focused on the benefits increased student engagement has on teachers (at any level), the benefits can be inferred. For example, increased faculty-student interaction resulted in greater job satisfaction (Bensimon & Dowd, 2009) and feelings of connectedness for faculty members (Kuh, 2009).

Although the benefits of incorporating student engagement practices are well-documented in the research, there is little to illustrate the consequences of disengagement beyond mere observation of what teachers may perceive as disengaged behaviors. Further, rarely have both student and teacher data been viewed simultaneously to understand the reciprocal nature of (dis)engagement in teaching and learning.

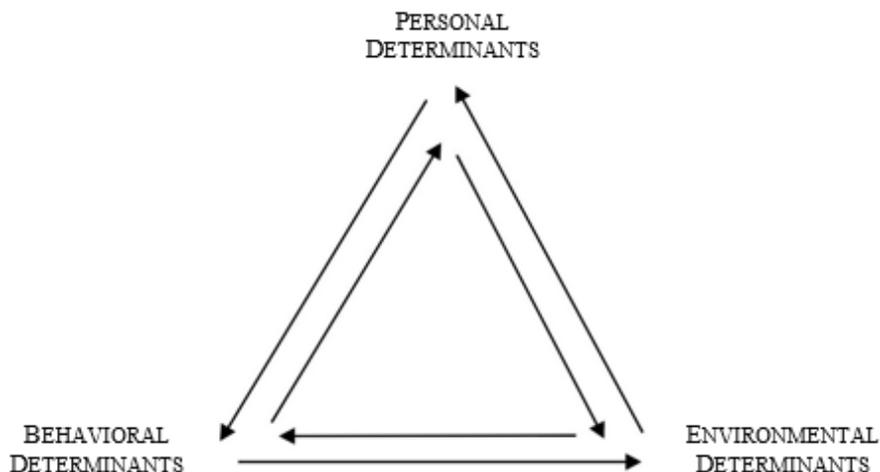
### Purpose

This study is a snapshot of a larger study describing and comparing how and when experience engages students in the learning. Although this study was an unanticipated outcome of the larger study, the phenomena of *teacher disengagement* lends insight to new challenges to teaching post-secondary courses in agriculture. Therefore, the purpose of this study was to illustrate or story the phenomena of teacher disengagement as an emergent etic perspective and consequence of implementing deep, prolonged instructional experiences in a post-secondary environment.

Research question: How can implementing deep, prolonged instructional experiences in a post-secondary environment affect teacher engagement?

### Theoretical and Conceptual Framework

Social cognitive theory (SCT; Bandura, 1986) provided structure to understand how individuals operate within and among systems of social interaction. Bandura's theory (see figure 1) depicted that human interaction can be explained best by understanding the interdependent and causal relationship between people, their behaviors, and the surrounding environment. By viewing personal characteristics as reciprocally altered by behaviors and environments, researchers can view people as both creators and products of their experiences and understand the way individual thoughts and feelings affect the different ways people approach the world (Bandura, 1986).



*Figure 1. Adapted figure of social cognitive theory (Bandura, 1986).*

For this study, I used SCT to understand change in student and teacher behavior with the use of personal and environmental determinants as stable concepts or variables. Admittedly, they weren't stable, but to simplify the concept, they will be thought of as stable. Theoretically, this can be understood best with a simple equation: the sum of personal and environmental equals behavioral ( $P + E = B$ ). Although simple on paper, this equation provides structure for the analysis of very complex human interaction. This simplification is not meant to water-down the complexity of Bandura's theory but rather to serve as a guide for more detailed understanding.

## **Method**

This autoethnography was part of a larger abductive, longitudinal, quasi-experiment that spanned one calendar year—three academic semesters (spring, summer, and fall). Although the findings of this study were focused on phenomena of teacher disengagement, the context of the course, activities, and students enrolled contributed to the findings. The larger study included four cohorts with varying levels of deep, prolonged experience. Forty-two students (six male and 36 female), between 18 and 25 years of age, agreed to participate in the study after enrolling in one of four sections of an undergraduate social science research methods course. Students represented four majors: agricultural leadership development, agricultural science, agricultural communications and journalism, and animal science.

When this study was conducted, I was a graduate student, and I co-taught the research course with my dissertation advisor and committee chair. Our students were involved as both participants and researchers. Specific learning objectives were aimed at developing students' abilities to access information, think critically, and present and support reasoned arguments. However, students studied engagement by evaluating theories, collecting data from other populations, while also being introspective about their own engagement in the course.

### *Design*

Although the larger study was an abductive, longitudinal, quasi-experiment the emergent etic perspective storied here was autoethnographic in nature. Autoethnography is a method of rigorous self-reflection and reflexivity that relies on the personal experiences of the researcher to describe and evaluate beliefs, practices, and experiences (Bochner & Ellis, 2006; Adams, 2015). By nature, "autoethnography is messy, uncertain, and emotional" (Adams, Jones, & Ellis, 2015, p. 19). The ability to use a research method to both accommodate for and acknowledge the difficult realities of social life helped me make meaning of my experiences struggling within a larger hyper-structured research design.

### *Sources of Data*

As part of the larger study, data were extracted from more than two hundred hours of interviews, four cohorts, and six hours of class per week (two courses, three times per week during spring and fall semesters), additional research meetings, conversations, and informal interactions of unknown amounts of time, and six weeks of immersive field experience. Additionally, quantitative data were collected from four commercially available instruments and used as artifacts to further increase the credibility of findings through data triangulation (Lincoln

& Guba, 1985). Although the findings presented in this study only include data from observations, reflexive journals, student-teacher dialogue, and countless hours of rigorous introspection, the influence other sources of data may have had on my interpretation cannot be untangled.

### *The Human Instrument*

Lincoln and Guba (1985) provided the characteristics that “qualify the human being as the instrument of choice for naturalistic inquiry” (p. 193). Unlike most quantitative instruments that measure specific factors, human beings are adaptable and “like a smart bomb, the human instrument can locate and strike a target without having been preprogrammed to do so” (Lincoln & Guba, 1985, pp. 193-194). As the primary instrument of data collection, I viewed this process from a nonlinear perspective, but also had the flexibility to use quantitative artifacts as sources of data. Data, regardless of method or source, were used to mold, adapt, and continuously calibrate the human instrument.

### *Observations*

Observations were made before, during, and after each class and research meeting and during the entire field experience. As an active participant in the experience, I was able to capture interaction, be inductive, and observe behaviors beyond what students would divulge during an interview (Patton, 2009). Observations brought my own perceptions to light as well as the perceptions of students as recorded in their reflexive journals.

### *Reflexive Journals*

In addition to my own journal, the reciprocal nature of the larger study required my students keep reflexive journals to reflect critically on the “human as instrument” (Guba & Lincoln, 1981). Journals served as a reservoir for our thoughts, feelings, observations, and field notes. Together, we chronicled the learning process while calibrating our instruments through self-discovery and interrogation (Lincoln, Lynham, & Guba, 2011). Journals provided insight to distinctive voices each of us brought to the classroom and led to a greater understanding of the multiple perspectives that framed the learning process (Alcoff & Potter, 2013).

### *Dialogue*

Students engaged in a constant exchange of thoughts and ideas that served as both a source of data and method of learning. Specific attention was given to Socratic dialogue to help unlock implicit ways of thinking and insights not previously explored by the group (Given, 2008). Many times, our Socratic sessions would occur spontaneously outside of the bounds of class meetings and usually near a white board. Our concepts, models, and brainstorms were captured in photos to visually recall and interpret the experience along the way.

### *Trustworthiness of Findings*

Lincoln and Guba (1985) outlined techniques for establishing trustworthiness to ensure findings are reached in a systematic and disciplined manner. Trustworthiness techniques mirror evaluation criteria found in quantitative research and provide increased “inspectability” of data

and findings. Techniques included credibility (internal validity), transferability (external validity), dependability (reliability), and confirmability (replicability). I used multiple techniques to enhance trustworthiness of findings including prolonged engagement, persistent observation, triangulation, audit trail, peer-debriefing, member-checks, reflexivity, and thick, rich description.

Extensive records (reflexive journals, sketchbooks, digital pictures of conceptual designs and models, and additional process and personal memos) were kept for confirmability and constant comparison of significant statements, codes, and emergent themes during data collection and analyses. In addition to my own journal, the nature of this study provided that my students keep reflexive journals to reflect critically on the “human as instrument” (Lincoln & Guba, 1982). Journals served as a reservoir for thoughts, feelings, observations, and field notes. Together, we chronicled the learning process while calibrating through self-discovery and interrogation (Lincoln, Lynham, & Guba, 2011). Due to the large amount of data acquired during this study, a coding structure was used to develop a detailed audit trail and is as follows:

Student data: *Ex: 014\_BR2\_079*

1. Student participant code (01 - 042)
2. Source of student data (BR = Black and Red notebook, SB = Sketchbook)
3. Page number associated with source = (001 – 175)

Teacher data: *Ex. FN\_BR3\_104*

1. Research activity (OBSV=Observation, FN = Fieldnote, RF = Reflection.
2. Source of teacher data ((BR = Black and Red notebook, SB = Sketchbook)
3. Page number associated with source = (001 – 175)

### *Data Coding, Analysis, and Presentation*

The complex task of understanding ethnographic data lies in the ability to condense mass amounts and sources of data (Merriam, 1998). I originally approached coding in a very inductive manner, using *in vivo* coding, descriptive codes, and deductive codes based on the theoretical framework of social cognitive theory (Miles, Huberman, & Saldaña, 1994). However, the use of social cognitive theory proved to only hinder the analytic process when considering the reflexive nature of my own data.

I continued with the coding process despite my frustrations; I inductively analyzed and coded data, developed additional codes to describe unexpected elements that emerged, and placed each into a matrix where they were continuously sorted into primary, secondary, and tertiary themes. It was not until much later that I discovered the process of analyzing data was not an exact science. Therefore, data were then viewed as analytic memos where I recorded additional elements of how the coding process took shape (Saldaña, 2016, p.44). The resulting findings were presented with student data alongside my own using verisimilitude—a literary strategy that captures the researchers’ thinking processes and attempts to realistically convey the intricacies of the experience with thick, rich description—thereby, enabling readers to reconstruct the experience for themselves (Creswell, 2009; Lincoln & Guba, 1985).

## Findings

### Words are Hard

#### *Native Language*

I began this process in search of a way to make learning research more engaging for undergraduate students. After considering various methods of classroom engagement, my teaching partner and I decided to forgo traditional teaching methods by avoiding the use of research terminology in class. Instead, we agreed to use common language to allow students to discover terms on their own and attach those words to experiences as they came about. For me, it was pretty easy to adhere to our native language because as a graduate student, research terminology was still new to my everyday vocabulary. However, my partner had been using research jargon for eight years and the transition was often difficult. *Words are Hard* quickly became a classroom hashtag and constant reminder to communicate in a way our students understand.

#### *Research as a Second Language*

The hashtag, #wordsarehard, became a fun “game” for our students. Our open and transparent process left very few things unsaid in our classroom, and students quickly caught on to the struggle we were experiencing with words. For students, myself included, research was a second language and “unlocking” new words was exciting... at first. For example, after observing other [University] students at various locations on campus, our students began to describe the various behaviors, environments, and personal characteristics they had observed. As one student wrote in his journal, “[Teacher] gets so excited when we figure things out. I need to Google Social Cognitive Theory” (07\_BR1\_014). My journal entry echoed their observation that day. *FN\_BR1\_029: It’s working! It’s really working! #wordsarehard #proudteacher*. I was motivated to provide them with experiences and attach terminology after they understood meaning. It seemed crazy, but research was becoming our second language and after years of learning terms just to pass a test, we were interested in how they became a permanent part of our vocabulary.

#### *Language Acquisition through Experience*

As time passed, words including “sample,” “instrument,” and “analysis” started to creep into our classroom discussions. Instead of discussing what might occur during an observation, interview, or face-to-face survey, students experienced issues first-hand and shared their successes and failures with our class. The chance to rifle through their experiences made it easier to share new terminology as we evaluated the process of understanding people. Although students seemed to be refreshed (or maybe just relieved) by the lack of terminology, a few also expressed a bit of confusion and annoyance with the process. One student was hesitant to speak up in class, but wrote “How is observing some people at the [student center] relevant to any kind of actual research” (013\_BR1\_018) in her journal. Another student wrote, “Just give [the terms] to me. I know how to do research! I’m tired of waiting around for you to give me information” (06\_BR1\_027). I wanted to understand their point of view, but was first irritated with their impatience. After returning to interview and preliminary data, I started to see the shared connection. Both students (sharing these frustrations) were double majors in animal science and

predisposed to research in the basic sciences. In a way, they were ahead of the rest of the class (and always would be), but reflections provided more insight as each progressed. One wrote, “Observations seemed like useless collections of information. I now see it was the beginning of understanding a larger process” (013\_BR1\_018).

### *Native Language Attrition*

Much to my surprise, as students gained efficacy with research terminology, I did too. Soon, my normal contributions to office banter were replaced with “what’s your unit of analysis,” and “what if we used a different conceptual framework?” I noted this transition after reflecting on time back home with friends. *FN\_BR3\_062: When will I realize that not every lunch requires #researchtalk? I’m blabbering. THEY DO NOT CARE. Obnoxious!* I found that it only got worse as time went on. Research permeated my every interaction from my first cup of coffee in the morning to the ideas I sent as text messages before bed. As the days passed, phone calls with my mom became more difficult and I could no longer explain to her what I had been up to. My “research buds” shared Piled Higher and Deeper (Ph.D.) comics on my Facebook wall poking fun at the phenomena, but I had a hard time finding humor in our shared experience. *FN\_BR3\_079: So much for being a great communicator! Might as well live under a rock.* Because I had surrounded myself with peers in the same situation, the issue didn’t really become a problem until a new crop of students began the second phase of this study. Everything I prided myself on was slipping away.

*FN\_SB2\_012: Why can’t I connect with them? ☹ #iteach?*

### *Lost in Translation*

In almost an inability to remember what it was like to struggle with the research process, I found it more difficult to engage the final cohort of students like the first. *FN\_BR3\_104: There’s a gap between cohorts that I don’t really understand quite yet. They are struggling. How do I make this better? I’m at a loss here.* It seemed my newfound connection to research terminology and the process of doing research left it difficult for me to connect student learning to new experiences and new experiences to student learning. The first cohort seemed to embrace new terms because they were anxious to finally get them. They anticipated them. They wanted them. The second cohort, however, didn’t seem to make connections in the same way. In some cases, the words seemed to pass by the experiences as if students were simply going through the motions. More times than I would like to admit, students wrote things like, “is she even talking to me?” or “I’m over trying to understand this class.” It hurt, but they were right. I was speaking a foreign language and oblivious that my connection was lost somewhere in translation.

### **Gut Punch: Cognitive Dissonance & Reciprocal Engagement**

“How can you expect me (student) to be engaged when you (teacher) aren’t?” (16\_BR1\_064)

*FN\_BR2\_084: Stop the bus. What did she just say? Are you kidding me?!*

Owww

I have no recollection of what I said in response to [student] that day, but was I completely taken aback by her comment. We had intentionally built an environment where students could feel comfortable saying things like this, but I doubt my response was indicative of that effort. I was angry. *FN\_BR2\_084: I'm giving everything I've got over here. Who do they think they are?* I spent the next few hours sitting at my desk ruminating on the remark. I started to wonder if we had given students too much power and freedom in the classroom. *FN\_BR2\_085: This is why structure is important. She would never say that to [faculty member].* My rant continued on the next two pages and finally subsided with a final thought.

*FN\_BR2\_087: Oh, wait. I told her to do that.*

### *Cognitive Dissonance*

The original remark about my perceived level of engagement resonated in eleven other student journals (all but two of the students' present) that day. Students began to question my general level of interest and motivation in the course. It was pivotal. I spent weeks (and months, really) thinking about how many times I teach students to do one thing, while modeling a completely different behavior. I also considered the many times I observed this type of behavior from my own teachers and mentors. This insight became a magnifying glass, of sorts, and I began examining almost all of my interactions. Could something as simple as "walking the walk and talking the talk" be paramount to this study? *FN\_BR3\_012: "Do as I say, not as I do."* *Looks like Dad's old mantra is coming back to haunt me.*

Although my reflection may seem trivial, to me it was revelatory. This study was originally designed to understand students and the experiences that engage them in learning, but all the while, I may have been looking in the wrong direction. I literally told them (on the first day of class) I wanted to find a new way. I told them I believed engagement to be a two-way process and I wanted their open and honest feedback. Yet, there I was ignoring my own levels of engagement in our course. [Student] provided the one piece of information that changed the way I considered this study, twelve little words that wracked my brain for months.

### **Autopilot: The Harsh Reality of (Dis)engagement**

You are different, beautifully so, and people will benefit from your perspective.

Your words mean something. This experience is teaching you far more than what can be observed – it's teaching you to believe in you." (06\_SB1\_003)

The excerpt (06\_SB1\_003), above, was written on a postcard and taped face down into the pages of a student's sketchbook. I thumbed through several times, never giving them too much thought (I assumed they were blank), but once the tape started to give, this postcard flipped over. It was one of ten she planned to send as little reminders to herself when she arrived back home. Lucky for me, she forgot to send them, and that afternoon, I sat by myself, read through each one, and bawled my eyes out.

*FN\_BR2\_114: I'm exhausted.*

When *teachers* say, “I’m exhausted”, I don’t really believe that’s what they mean. I’m sure they are tired and may *think* they are exhausted, but what I really *hear* them saying is, “I’m not excited about what I’m doing right now.” When *teachers* are *engaged*, they ignore being tired; they’re in the zone and running on fumes of passion.

*FN\_BR2\_115: I'm really exhausted.*

I fully recognize the blatant contradiction here, but that doesn’t change the reality of its occurrence. Comments like the one above peppered my field notes during the last six months of this study. I was ashamed to write down thoughts like, “What am I doing?” or “I don’t want to be here,” so I didn’t, but they occurred nearly three times as much. *There I said it. I was on autopilot.*

The shame of thinking these things, let alone including them in this study, was paralyzing. The idea of being “called out” for a *less than perfect study* because I was a *less than perfect* teacher was more than my pride (and future) could take. I felt like a big ole’ phony. Surely, I wasn’t the only one to ever feel this way, right? *Right?*

When *students* say, “I’m exhausted”, I don’t really believe that’s what they mean. I’m sure they are tired and may *think* they are exhausted, but what I really *hear* them saying is, “I’m not excited about what I’m doing right now.” When *students* are *engaged*, they ignore being tired; they’re in the zone and running on fumes of passion.

“I’m exhausted” (38\_BR1\_071).

*Huh?* It was like some form of black magic. My students couldn’t possibly be experiencing the same thing. *We’re different. They don’t know what I know.* The rare occurrence of this finding in the literature made the connection between my data and my students’ data even more difficult to accept. I needed some reassurance. *FN\_BR3\_099: HELP!! I give up. This is impossible.*

### **Cold Hard Truth**

This study took me down a long, circuitous path. Communicating the findings (on paper) has been a monumental task, but I have told this story (to anyone who would listen) every day since it began. I wrestled with my own experiences— both teaching *and* learning—at every turn. I questioned and resisted what I considered to be “conformity;” I’ve been angry, frustrated, and disenchanted; and I developed a pretty large chip on my shoulder, too. *FN\_BR3\_047: How can I communicate this experience? How do I adequately portray my own disengagement? How do I describe how much I’ve changed? I don’t even feel like a teacher anymore.*

To this point, the “pieces” or themes were like vignettes that lined the walls of my heart and mind for months, but they remained static without understanding the experience more holistically. The fact is, “words *are* hard”—hard to articulate, difficult to write, painful to digest, and often lost without the ones around them. The larger study began with specific research questions concerning the influences of experience on student engagement, however, “the path of

discovery is not clearly marked, nor should it be” (Thorp, 2001, p. 37). I could have easily described student engagement throughout the entire study, outlined findings of the hyper-focused quasi-experimental design I set out to follow, and provided more direction for others to build on for the future, however, that would have alienated the most glaring pieces of data—my own.

## Discussion

As the case with most naturalistic inquiry, the purpose of this study was not to infer to a larger population. Rather, the intent was to understand an unanticipated and, arguably, unfortunate phenomena: Teacher disengagement. Not only is the literature describing these phenomena vague, it may be nonexistent.

Experience was noted in no less than five of the seven research priority areas of the *National Research Agenda* (Roberts, Harder, & Brashears, 2016). Further, the history of, need for, and value of integration of experience into agricultural education environments was thoroughly noted by Baker, Robinson, and Kolb (2012). Despite the expansive number of researchers who have recommended integrating experiences into the educational environment, few have noted many of the potential unintended consequences of implementing deep, prolonged instructional experiences in a post-secondary environment. The occurrence of these consequences is not likely a new phenomenon. Yet, the implications of presenting *ugly data* or the unintended consequences of a study are not widely present in the agricultural education literature. Therefore, several potential elements should be further investigated and considered as parts of future studies:

### *Issues with Unrealizable Objectivity*

Although it may seem as if I abandoned the design of this study somewhere along the way, that is not entirely the case. The design was like a too-tight sweater. Uncomfortable but difficult to get rid of. The truth is I became so focused on design that I had a difficult time connecting with the most important and significant part of my study: *my students*. It was important for me to tell that story, to illustrate the many ways in which this study changed because I changed, and allow the reader to come to conclusions on their own. Ignoring the growing pains would have omitted the difficult truths of an unrealizable objectivity – something I’m afraid is all too common in research, but rarely explored. My attachment to design, and to the research process for that matter, made it more difficult for me to engage in the very environment I created. My quest to understand the complex nature of people and social interaction was beset by my own transition from teacher to researcher. I was no longer the responsive and adaptable educator, but instead a rigid and design-focused researcher.

### *Meaningful Connection in High Stakes Learning Environments*

The process of learning new information is only engaging for so long without a personal connection between teachers and students. Harper and Quaye (2009) argued student engagement required more than an understanding of the teacher’s time and effort. The findings of this study provide evidence to support the influence of time and effort, but also raise questions of where that time and effort should be placed for effective learning. In this case, I placed the most time and effort on the *process* of conducting research instead of the *people* involved. I lost the

connection with students when I stopped being responsive to their needs. There was no meaningful emotional connection to help make students connect to their learning experience, thus altering the overall learning environment.

Might the high-stakes environments discussed by Heubert and Hauser (1999) be to blame for the unintended consequences of disengagement by both students and teachers? Could the pressures of producing high quality research discourage teachers from improving instruction to engage students? Or is it simply the nature of research to become detached when adhering to more focused and structured designs? Future research should consider the environmental factors associated with faculty and graduate student expectations as it relates to student and teacher (dis)engagement in higher education.

### *Connection Between Student & Teacher Experience*

Often times, research considers the issues of student engagement independently from teacher engagement, providing a host of strategies to help foster a better learning environment. However, rarely are the variables considered side-by-side in a more holistic way. In doing so, it may be easier to notice the behaviors exhibited by students are not all that different from their teachers. Future research may benefit from observing engagement as a more universal phenomenon that affects teacher and student behavior similarly.

### *The Problem with Theories*

Although social cognitive theory was not the guiding force of this study, it served as a point of reference when considering factors of teaching and learning. At a granular level, factors suggested to change student and teacher engagement were easy to understand, but the bigger challenge required that I consider the way each and every interaction changed the next in a dynamic way. It was a sequence of interactions, changes, and behaviors too large for me to see alone and the belief that a simple formula might uncover one solution was short-sighted. The simplification was intended to guide understanding, but a more complex analysis was needed.

The static and predictable nature of many theories may lead people (especially young researchers) to believe the findings of this study (or any study for that matter) are merely formulaic in that the same person, doing the same thing, in the same way would provide the same answer every time. However, formulas are rigid and conventional, and albeit mathematical, function as a way to solve problems--human or otherwise. The sheer number of variables needed to consider the dynamic interaction between students and teachers during the process of learning is overwhelming, but should be considered, nonetheless. Could teachers be using an old formula that produces the opposite results?

The nature of human complexity requires the use of more than static formulas to understand problems. Instead, I contend student and teacher engagement, and thus, (dis)engagement to be more of a complex algorithm that adapts and changes. Although I believe key "formulas" make up an engagement algorithm, those formulas, the way they are arranged, and the many ways in which they change is more complex than what I could understand during

the course of this study. Understanding the findings of this study and the way it emerged would be too complex of a task without the consideration of a larger, more adaptable algorithm. Future research should consider student and teacher (dis)engagement as an algorithm that stretches and changes in new, more dynamic ways.

### *New Methods in Agricultural Education*

*Ok. Hear me out.* Many of the struggles of this study and my ability to adequately describe my experience may lie in our professions level of discomfort with more uncommonly used methods. As a graduate student, I worked alongside my mentors to develop a quasi-experimental study to “increase the rigor” associated with Agricultural Education research in the social sciences. All the while, this design held me back from truly understanding the phenomena at play. *I struggled.* I sought out additional qualitative methods, but rarely saw those methods in the pages of our journals. It seemed (to me) that I must adhere to a more structured design if I wanted to succeed. Might young researchers be hindered by our collective distaste for new methods? How can we encourage and mentor young researchers in rigorous methods spanning paradigms? What does the future of Agricultural Education (broadly-defined) look like when young and old researchers alike struggle with making sense of a too-tight and seemingly sterile science in a socially-constructed world? How do we help? *Help.*

### **References**

- Adams, T. E., & Manning, J. (2015). Autoethnography and family research. *Journal of Family Theory & Review*, 7(4), 350-366.
- Adams, T. E., Jones, S., & Ellis, C. (2015). Autoethnography: Understanding qualitative research. *New York: Oxford University Press*, 978(0), 19.
- Alcoff, L., & Potter, E. (Eds.). (2013). *Feminist epistemologies*. New York, NY: Routledge.
- Bain, K. (2004). *What the best college teachers do*. Cambridge, MA: Harvard University Press.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bensimon, E. M., & Dowd, A. (2009). Dimensions of the transfer choice gap: Experiences of Latina and Latino students who navigated transfer pathways. *Harvard Educational Review*, 79(4), 632-659.
- Ellis, C. S., & Bochner, A. P. (2006). Analyzing analytic autoethnography: An autopsy. *Journal of contemporary ethnography*, 35(4), 429-449.
- Charmaz, K., & McMullen, L. M. (2011). *Five ways of doing qualitative analysis: Phenomenological psychology, grounded theory, discourse analysis, narrative research, and intuitive inquiry*. Guilford Press.
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*. 39(7), 3-7.

- Coates, H. (2007) A model of online and general campus-based student engagement. *Assessment and Evaluation in Higher Education*. 32(2), 121–141.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles, CA: Sage.
- Dewey, J. (1938). *Experience and education*. New York, NY: Macmillan.
- Edgar, D. W., Retallick, M. S., & Jones, D. (2016) Research priority 4: Meaningful, engaged learning in all environments. T. G. Roberts, A. Harder, & M. T. Brashears (Eds.). *American Association for Agricultural Education national research agenda: 2016-2020* (pp. 37-40). Gainesville, FL: Department of Agricultural Education and Communication.
- Given, L. M. (Ed.). (2008). *The Sage encyclopedia of qualitative research methods*. Sage Publications.
- Glaser, B., & Strauss, A. (1967). Grounded theory: The discovery of grounded theory. *Sociology The Journal of The British Sociological Association*, 12, 27-49.
- Harper, S. R., & Quaye, S. J. (2009). Beyond sameness, with engagement and outcomes for all. In: *Student Engagement in Higher Education*. New York and London: Routledge, pp. 1–15.
- Heubert, Jay P. & Hauser, R.M. (1999). High stakes: Testing for tracking, promotion, and graduation. A report of the National Research Council. Washington, DC: National Academy Press.
- Hu, S. and Kuh, G.D. (2001) *Being (dis)engaged in educationally purposeful activities: the influences of student and institutional characteristics*. Paper presented at the American Educational Research Association Annual Conference. Seattle, WA, 10–14 April.
- Johnson, D. W., Johnson, R. T., and Smith, K. A. (2001). *Cooperative Learning: Increasing College Faculty Instruction Productivity*. ASHE-ERIC Higher Education Report No. 4. Washington, DC: The George Washington University, School of Education and Human Development.
- Krause, K. and Coates, H. (2008) Students' Engagement in First-Year University. *Assessment and Evaluation in Higher Education*. 33 (5), pp. 493–505.
- Kuh, G.D. (2009) The National Survey of Student Engagement: Conceptual and Empirical Foundations. *New Directions for Institutional Research*. 141 (Spring 2009), pp. 5–20.
- Lincoln, Y. S., & Guba, E. G. (1982). Establishing Dependability and Confirmability in Naturalistic Inquiry Through an Audit.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.

- Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Program Evaluation*, 1986(30), 73-84.
- Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011). Paradigmatic controversies, contradictions, and emerging confluences, revisited. *The Sage handbook of qualitative research*, 4, 97-128.
- Magolda, P. M. (2005). Proceed with caution: Uncommon wisdom about academic and student affairs partnerships. *About Campus*, 9(6), 16-21.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Jossey-Bass.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. Los Angeles, CA: Sage.
- National Research Council. (2009). *Transforming agricultural education for a changing world*. Washington, DC: National Academies Press.
- Patton, M. Q. (2009). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.
- Piaget, J. (1976). *Piaget's theory* (pp. 11-23). Springer Berlin Heidelberg.
- 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.
- Sheldon, K.M. & Biddle, B.J. (1998). Standards, accountability, and school reform: Perils and pitfalls. *Teachers College Record*, 100, 164-180.
- Sorathia, K., & Servidio, R. (2012). Learning and experience: Teaching tangible interaction & edutainment. *Procedia-Social and Behavioral Sciences*, 64, 265-274.
- Thorp, L. G. (2001). *The pull of the earth: An ethnographic study of an elementary school garden* (Doctoral dissertation). Texas A&M University, College Station, Texas.

**No Discussant Remarks**

# Utilizing Videos to Encourage Elaboration and Improve Attitudes toward Fertilizer Best Practices

Tiffany M. Rogers-Randolph, University of Florida  
Dr. Joy N. Rumble, University of Florida  
Dr. Laura A. Warner, University of Florida

This work was supported by the  
University of Florida Center for Landscape Conservation and Ecology.

## Abstract

*To examine the communication strategies at the disposal of Extension professionals, this study aimed to explore videos as a medium to communicate about water issues and fertilizer practices. The purpose of this study was to assess the influence of video messages on Florida residents' elaboration and attitudes toward fertilizer practices. Residents' attitudes and elaboration were investigated through the lens of framing theory and the elaboration likelihood model, with specific consideration for goal orientation in message processing. A sample of 2,000 lawn or landscape owners obtained through non-probability sampling participated in an online survey that measured attitudes and elaboration. An experimental treatment presented participants with one of two goal orientation messages and one of two videos conveying correct fertilizer application practices. One video was designed with a personal frame, the other with a social frame. Overall, respondents held favorable attitudes toward fertilizer practices; however, the control group held the lowest mean attitude. After being exposed to the video treatments, the respondents demonstrated low elaboration across all treatment groups. The existence of significant differences in attitudes held toward fertilizer practices indicated that the framing and goal-orientation of the video message did impact attitudes of respondents. Attitudes of respondents exposed to a video with a social frame and goal-orientation were significantly higher than respondents who did not view a video message and therefore were not exposed to a goal orientation message or frame. This research will help Extension professionals understand how to communicate about fertilizer practices in an effort to improve water quality.*

## Introduction

Most residential lawns are fertilized (Law, Band, & Grove, 2004), and turfgrass coverage in the United States has been estimated at more than 63 thousand square miles, an area three times greater than any of the country's irrigated agricultural crops (Milesi et al., 2005). Home fertilizer application practices can be highly variable, and residents may assume that because a small amount of a fertilizer product is helpful, greater amounts are better (Law et al., 2004; Southwest Florida Water Management District [SWFWMD], 2011).

Fertilization application where rates, products, delivery methods, or timing do not match the needs of the turfgrass and landscape plants can contribute to water quality impairment (Carey et al., 2012; Law et al., 2004; Trenholm & Sartain, 2010; Shober, Denny, & Broschat, 2010). When fertilizer is not completely taken up by plants, excess nitrogen and phosphorus can be introduced to water bodies, comprising one important component of nonpoint source pollution (NPS; EPA, 2017; Law et al., 2004). NPS is pollution that cannot be traced to a single source and consists of a combination of anthropogenic and natural pollutants (EPA, 2017). While an individual household's NPS contribution may seem minimal, each residence belongs to a watershed, or an area of land that drains to a shared water body such as a river, ocean, or aquifer (EPA, 2017). It is the additive effect of many households and other NPS contributors that leads to impaired water bodies. Impaired water bodies may exhibit eutrophication or excessive algae growth, or algal blooms, which may become toxic to people, aquatic vegetation, and fish (Carey et al., 2013). For this reason, it is beneficial to find ways to reduce the introduction of NPS to watersheds, which presents an opportunity for agricultural education and communication professionals.

While the nature of NPS means it is difficult to isolate and quantify residential contributions, studies have reported amounts approaching and exceeding half of the nitrogen in a specific watershed could be traced back to residential fertilization (Hobbie et al., 2017; Law et al., 2004). Water quality can be protected by promoting fertilizer application in rates and at times most conducive to plant uptake (Trenholm & Sartain, 2010; Shober et al., 2010). Other best management practices include applying fertilizers according to soil nutrient test results and ensuring fertilizers are removed from impervious surfaces after application (Dietz et al., 2004).

Residents have indicated clean water for various purposes is more important than plentiful water for various purposes (Warner, Kumar Chaudhary, Lamm, Rumble, & Momol, 2017). However, residents tend to feel greater dissatisfaction with the availability of clean water compared to plentiful water (Warner, Kumar Chaudhary et al., 2017). Yet, residents' landscape practices may not align with their values (Carey et al., 2012) and there is a disconnect between a household's landscape management practices and their perceived influence on water quality (Warner, Kumar Chaudhary et al., 2017). Recent studies have examined perceptions surrounding water quality. One study reported a disconnect between actual water quality issues and public perceptions (Leal, Rumble, & Lamm, 2015). Another study reported residents were somewhat less comfortable with their role in protecting water quality when compared to their role in conserving water (Warner, Lamm, & Kumar Chaudhary, 2018). For these reasons, agricultural education and communication professionals have been encouraged to address the disconnect in water quality perceptions and help people understand how their landscape management actions influence water (Leal et al., 2015; Warner, Kumar Chaudhary et al., 2017).

Educational programs encouraging residents to engage in appropriate fertilizer use should be a priority for those who work on water quality, but these programs need to change attitudes and fertilizer practices (Carey et al., 2012). Water quality programs need to employ intensive programming efforts to elicit these practice changes (Dietz, Clausen, & Filchak, 2004). Effective communication about proper fertilizer practices competes with advertising and conflicting

messages from different agencies (SWFWMD, 2011). An additional barrier to effectively communicating about this issue is the complex nature of proper fertilization (SWFWMD, 2011). Importantly, Extension professionals can contribute to the reduction of residential fertilizer as a source of NPS which will lead to improved water quality. In the realm of Extension, key leaders saw an opportunity for improved message development to prompt behavior change in areas such as fertilizer application (Warner, 2014). When communicating about water quality issues, and subsequently fertilizer practices, Warner, Rumble, Martin, and Cantrell (2015) found that the effectiveness of a water conservation message relied heavily on the selection and presentation of the given message. This study sought to explore video as a means of presentation as suggested by Warner, Ali, and Kumar Chaudhary (2017) and Perrin (2011). With a variety of communication approaches being available for Extension professionals to utilize, it becomes necessary to employ the most appropriate message and delivered through the most appropriate medium to avoid “ineffective or misleading campaigns” (Warner, Rumble et al., 2015, p. 60).

### **Theoretical Framework**

In order to further examine the communication strategies at the disposal of Extension professionals, this study aimed to explore videos as a medium to communicate about water issues. Furthermore, an in-depth examination of framing and motivation factors in message design were considered in this context. This study investigated individuals’ attitudes and elaboration through the lens of framing theory and the elaboration likelihood model (ELM), with specific considerations for goal orientation in message processing.

Framing is often compared, much as the name implies, to a frame placed around a photograph or painting (Reese, Gandy, & Grant, 2001). In this metaphor, a communicator plays the role similar to that of an artist by choosing the frame to present the scene (Bryant & Zillmann, 2002). Through this process, the communicator aims to evoke specific reactions in their audience by selecting certain elements of a topic to make more salient (Entman, 1993). In regard to an issue, audiences’ attitudes are significantly shaped by new frames as they are introduced (Bryant & Zillmann, 2002).

Extension professionals may choose to frame an issue through the lens of value framing. Value framing is effective at shaping attitudes because it accounts for individuals’ beliefs and previously-held values (Brewer & Gross, 2005). Shah, Domke, and Wackman (1996) and Shen and Edwards (2005) suggested that the likelihood of influencing audiences’ attitudes is greater when value framing is utilized. Framing research within the context of water quality and quantity has found the use of value framing by Extension professionals to be effective in appealing to their target audience (Warner, Rumble et al., 2015). Specifically, personal and social value frames are more likely to influence residential audiences’ attitudes and encourage the adoption of water conservation practices (Warner, Rumble et al., 2015).

Cacioppo, Petty, Kao, and Rodriguez (1986) posit that people are often driven to hold what they believe is the correct attitude, but frequently do not have the capacity or time to dedicate the cognitive resources to evaluate every persuasive argument. Different situational

factors surrounding persuasive messages foster different levels of cognitive processing and elaboration (Cacioppo et al., 1986). Elaboration is often defined as “the extent to which a person thinks about issue-relevant arguments” in response to a message (Petty & Cacioppo, 1986, p. 128). The ELM argues the persuasion can occur when cognition operates at a high or low level, but the elaboration process and resulting attitudes will be different. The elaboration that occurs serves as the differentiator between the two distinct routes of persuasion, central and peripheral (Petty & Cacioppo, 1986).

Engagement in central route processing demands effortful cognitive activity in that it requires individuals to draw upon their prior experiences and knowledge to evaluate the information and merits of the message (Petty, Brinol, & Priester, 2009). For these reasons, this route requires motivation, or goal orientation, and the ability to process the message on behalf of the individual. Central route processing frequently results in resilient attitude change. Due to the nature of the cognitive processes and high-level evaluation that occurs during central processing, attitudes influenced through this route are typically “easy to access from memory, held in high confidence, persistent over time, predictive of behavior, and resistant to change” (Petty et al., 2009, p. 134).

However, a change in attitude is not always preceded by laborious mental effort. Recipients of persuasive communication will not find every message relevant, important, or interesting; nor will they always be afforded the luxury of time and the opportunity to systematically scrutinize the message (Petty et al., 2009). When the aforementioned situation occurs, processing via the peripheral route allows persuasion to be initiated by simple cues. These attitude changes are cultivated through the passive acceptance or rejection of cues and frequently have an unsound foundation. The resulting attitudes differentiate themselves from those invoked by central processing by being powerful in the short-term but tending to dissipate over time (Petty et al., 2009).

An individual's goal orientation, or motivation, to process a message is a key element in determining the processing channel that one will engage in to evaluate a message (Mackenzie & Spreng, 1992). The second key factor being an individual's ability to process the message. Mackenzie and Spreng (1992) delved deeper into this concept of ELM to explore how goal orientation affects the relationship between central and peripheral processing in the context of brand attitudes. By manipulating the processing goals of message receivers, they found that increasing motivation strengthened the impact of central brand processing on brand attitude, “not by causing consumers to generate more brand-relevant thoughts, but by causing them to give greater heed to the ones they have” (Mackenzie & Spreng, 1992, p. 528). Increased motivation appeared to increase the likelihood to base the formation of their attitudes on these thoughts. Beyond this finding, increasing goal orientation or providing processing goals also increased the degree to which individuals were willing to form future behavioral intentions that were dependent upon their attitudes (Mackenzie & Spreng, 1992). Further analysis has also indicated that the provision of processing goals can influence elaboration (Keller, 1991; Shavitt, Swan, Lowery, & Wanke, 1994; Gurhan-Canli & Maheswaran, 2000).

In today's visually-heavily communication culture, it becomes a necessity to understand the role that visuals play in persuasive communication (Lazard & Atkinson, 2014). Lazard and Atkinson (2014), however, bring light to the fact that visuals have not always been taken into consideration with traditional persuasive communication theoretical frameworks. This is problematic as it ignores the holistic lens that messages are typically viewed through, "that is all visual elements of a message – both imagery and text – are seen as one constructed unit on first impression or initial glance" (Lazard & Atkinson, 2014, p. 5). These initial impressions serve a crucial role in the determination of the processing route as it has the potential to affect a recipient's interest and attention, and subsequently their motivation for engaging in elaboration. Historically, visuals contained within a message have been reserved for the role of a peripheral cue (Petty & Cacioppo, 1986). Through exposure to infographic visuals of pro-environmental behavior, Lazard and Atkinson (2014) argue that when integrating visuals with text-based content, audience evaluation of the message increased. The authors suggested the messages combining visuals and text result in greater elaboration than their text-only counterparts and that they hold "important opportunities for the communication of persuasive environmental issues" (Lazard & Atkinson, 2014, p. 22).

Previous framing and ELM research in the context of Extension programming has found effective channels to engage peripheral processing. Rumble, Lamm, Martin, and Warner (2017) discovered employing socially-framed messages to be successful at initiating peripheral attitudes. Messages boasting a personal frame were also found to prompt peripheral attitudes, but this frame was determined to be less effective as some participants maintained their original attitude (Rumble et al., 2017). Warner, Ali et al. (2017) utilized text-based messages to evaluate Extension messages around the topics of water quality and fertilizer use, however they suggested that "videos may be more effective, future research should examine the effect of short video messages, along with the combination of tailored print and video messages, on irrigation and fertilizer intent" (p. 17; Perrin, 2011).

Further justification for the exploration of videos as a medium to communicate agriculture and natural resources issues was provided through Schroeder's (2015) assertion that videos are one of the most powerful mediums for this industry. It is projected that by 2019, 80% of Internet traffic will be attributed to video consumption (Weinschenk, 2011). Beyond the numerical potential of videos as a medium, "video is a persuasive form of communication because the faces, voices, emotions, and movements depicted are rich in information and inherently attract human attention (Qu, Lamm, Rumble, & Telg, 2017, p. 1).

In fact, Qu et al. (2017) explored the framing effects of videos in the context of agriculture and natural resources issues, specifically, attitudes toward local food. The research team found that framed videos elicited more favorable attitudes toward local food, while no video exposure produced a neutral attitude. Contrary to previous research, it was discovered that strengthening social connections was not an effective frame to communicate this issue. The researchers noted this contradiction and suggested further exploration into the use of socially-framed messages. The differences in the impact of the video treatments suggested that mass media is not a magic bullet and that communication materials do not always produce the

anticipated results. Therefore, videos must be designed with messages framed appropriately for the intended audience. Furthermore, the researchers concluded that videos are an effective tool to communicate about agriculture and natural resources issues when properly framed and agricultural communicators, educators, leaders, and Extension professionals should consider them as a tool in their arsenal when conveying information about these issues. Qu et al. (2017) recommended that further research is needed on this front because understanding how to communicate about these issues “is crucial for effective communication results” (p. 12).

### **Purpose and Objectives**

The purpose of this study was to assess the influence of video messages on Florida residents’ elaboration and attitudes toward fertilizer practices. This research will help Extension professionals understand how to communicate about fertilizer practices in an effort to improve water quality. The objectives of the study were:

- 1) Describe Florida residents’ attitudes and elaboration toward fertilizer practices;
- 2) Compare Florida residents’ attitudes toward fertilizer practices among different frame and goal orientation groups after receiving a video message.
- 3) Compare Florida residents’ elaboration toward fertilizer practices among different frame and goal orientation groups after receiving a video message.

### **Methods**

The population of interest for this study was Florida residents, 18 years of age or older. Respondents were also required to meet the criteria of owning a lawn or landscape that they fertilize or that they make fertilizing decisions for. A survey sampling company was utilized to access respondents. Initially, 4,391 potential respondents were screened. Of these potential respondents, 2,870 belonged to the target population as indicated by the screening questions and of these, 2,000 participated in the study for a 69.7% participation rate. The opt-in panel sampling technique utilized to obtain this sample is a non-probability design in which all possible respondents do not have the equal chance of participation in the study (Baker et al., 2013). Because the purpose of this study intended to examine a specific audience, post-stratification weighting was not utilized due to the unknown demographics of this population.

Online survey methodology was used to collect data from respondents. The researcher-developed data collection instrument was reviewed by a panel of experts in the areas of Extension education, agricultural communication, water resources, environmentally-friendly landscaping, and soil and water sciences. Approval for the study was granted by the University of Florida Institutional Review Board allowing the study’s course of action to proceed. In addition to demographic questions, this study focused on two questions, from a larger study, for analysis regarding fertilizer practices. The development of these two questions for the larger instrument was informed by ELM and focused on the measurement of attitudes and elaboration. Final validation of the instrument was conducted with a soft launch of 50 responses, allowing the

researchers to examine the preliminary data, scale reliability, and ensure there was no missing data.

Prior to measuring attitude and elaboration, this study employed a two-by-two experimental design which exposed respondents to one of four treatments in the form of a video message (Table 1). The respondents were randomly assigned to one of the following treatment groups: personal video goal orientation (PVGO) ( $n = 401$ ), personal video non-goal orientation (PVNGO) ( $n = 401$ ), social video goal orientation (SVGO) ( $n = 400$ ), and social video non-goal orientation (SVNGO) ( $n = 400$ ). A control group was utilized to allow the effect of the videos to be assessed. The control group was not exposed to a video stimulus or goal orientation ( $n = 398$ ).

Table 1  
*Respondents of Each Treatment Group and Control Group*

Group	<i>f</i>	%
Personal Video Goal Orientation (PVGO)	401	20.05%
Personal Video Non-Goal Orientation (PVNGO)	401	20.05%
Social Video Goal Orientation (SVGO)	400	20.00%
Social Video Non-Goal Orientation (SVNGO)	400	20.00%
Control Group (No video treatment)	398	19.90%

The videos presented four tips to viewers for correct fertilizer application practices. To control for the effects of the stimuli, all of the videos were 35 seconds in length and contained the same visuals demonstrating the fertilizer practices, narration describing the practices and benefits from implementation, along with on-screen text reiterating the voice-over narration per the suggestion of Lazard and Atkinson (2014) to increase elaboration through the combination of visuals and text. The experimental treatment consisted of the goal orientation provided to respondents before viewing the video and in the framing of the video message. Following the prescription of Mackenzie and Spreng (1992), the researchers directed the processing goals of the respondents through a message prior to exposure to the media. All respondents, except those in the control group, were provided with the same plausible processing goal to examine a “peripheral aspect of the message,” half of the respondents were then provided with the “additional processing goal of evaluating the issue” (Mackenzie & Spreng, 1992, p. 524). The following were the goal orientation messages utilized for this study.

Non-goal orientation:

The purpose of this section is to investigate how people like you consume information presented in a video. Your task is to examine the video just as you would if it were a video you were interested in viewing. Following the video, you will be asked some questions about your thoughts and perceptions.

Goal orientation:

The purpose of this section is to investigate how people like you consume information presented in a video. Particularly, we are interested in how you consume information about proper fertilizer practices. Proper fertilizer practices are important in helping to protect our water resources. If proper fertilizer practices are not followed, we may damage our ecosystem. Your task is to examine the video just as you would if it were a video you were interested in viewing. Following the video, you will be asked some questions about your thoughts and perceptions.

After receiving one of the goal orientation messages, respondents in the treatment groups were exposed to a video consisting of one of two frames: personal or social (Table 2). Personal and social frames were selected to design the videos for this study as value framing, particularly personal and social value frames, have been found to be effective by Extension professionals at influencing residents to adopt environmentally conscious behaviors in the context of water conservation practices (Warner et al., 2015).

Table 2  
*Video Treatments*

Video Frames	Video URL
Personal	<a href="https://youtu.be/qeotmxztURk">https://youtu.be/qeotmxztURk</a>
Social	<a href="https://youtu.be/a_5tXdEG3fk">https://youtu.be/a_5tXdEG3fk</a>

The scripts used to express the frames were built based on prior research findings and were reviewed and validated by a panel with expertise in agricultural communications and extension programming. Respondents viewing the video with a personal frame heard the following script:

Florida’s rivers, lakes, and springs rely on you to do your part in ensuring a positive impact on the environment. Before you fertilize your lawn or landscape, read the label on the fertilizer bag to make sure you apply the right amount. Use fertilizer responsibly by sweeping any spilled fertilizer back onto your lawn or into the bag. Your efforts to properly apply fertilizer can ensure that Florida’s rivers, lakes, and springs remain a safe place for you to enjoy.

Respondents exposed to the social frame treatment heard the following script:

Florida’s rivers, lakes, and springs rely on us to do our part in ensuring a positive impact on the environment. Before you fertilize your lawn or landscape, be a role model for others by reading the label on the fertilizer bag to make sure you apply the right amount. Use fertilizer responsibly by sweeping any spilled fertilizer back onto your lawn or into the bag. Your efforts to properly apply fertilizer can ensure that Florida’s rivers, lakes, and springs remain a safe place for your friends and neighbors to enjoy.

Following the video, respondents were asked a quality check question to ensure they were attentive to the survey. Respondents were asked, “Which of the following videos were you able to view? 1) A video about using fertilizer appropriately in the landscape, 2) A video about designing a butterfly garden, 3) a video about home construction.” If they indicated that the video was about designing a butterfly garden or home construction they were dismissed from the survey.

After the presentation of the experimental treatment, elaboration of the message was measured. Elaboration was measured using the Elaboration Measure (Reynolds, 1997) which consisted of a 12-item, seven-point Likert-type scale, ranging from *entirely disagree* (1) to *entirely agree* (7). Respondents were provided with the prompt, “While viewing the video message were you...” Followed by the twelve statements, “Attempting to analyze the issues in the message,” “Not very attentive to the ideas,” “Deep in thought about the message,” “Unconcerned with the ideas,” “Extending a good deal of cognitive effort,” “Distracted by other thoughts not related to the message,” “Not really exerting your mind,” “Doing your best to think about what was said,” “Reflecting on the implications of the arguments,” “Resting your mind,” “Searching your mind in response to the ideas,” and “Taking it easy.” The negative statements were recoded for analysis. According to Field (2013), to be reliable, constructs should boast a Cronbach’s alpha of .70 or greater. This index was found to be reliable ( $\alpha = .813$ ). Final elaboration scores could range from 1 to 7.

Following the measurement of elaboration, respondents’ attitude toward fertilizer practices was measured. Attitude was measured on a six-item, 5-point semantic differential scale. Respondents were presented with the following statement, “Implementing good fertilizer practices is...” and were then asked to choose a point between the sets of opposite descriptors. In the coding process, negative adjectives were assigned a “1,” and positive adjectives were distinguished with a “5,” thus higher attitudes signified more positive attitudes toward fertilizer practices. The pairs of adjectives were as follows, “good/bad,” “important/unimportant,” “foolish/wise,” “beneficial/harmful,” “positive/negative,” and “unnecessary/necessary.” Four of the word pairings were reverse coded for analysis. The index for attitudes was also found to be reliable ( $\alpha = 0.911$ ). Final mean attitude scores could range from 1 to 5.

SPSS (version 25.0; IBM Corp., Armonk, NY) was used to analyze all data within this study. Objective one was analyzed using descriptive statistics to describe respondents’ attitudes and elaboration toward fertilizer practices. For objective two, a one-way ANOVA was utilized to analyze the data to determine if a difference in attitudes existed between the control group and those exposed to the video treatments. A one-way ANOVA was also utilized in the evaluation of objective three to determine if there was a difference in elaboration between the groups exposed to the video treatments. It should be noted that the control group was not included in the analysis of objective three as this group was not exposed to the video stimulus; therefore, elaboration in response to the video could not be measured. Prior to the conduction of the analysis, the assumptions of normality, independence, homoscedasticity, and distribution error were tested and satisfied (Field, 2013).

## Results

As evidenced in Table 3, nearly two-thirds of the respondents were female (61.4%) and approximately one-third of respondents were male (38.7%). The majority of respondents were over the age of 50. Most respondents made between \$25,000 and \$149,000 in annual income. The greatest portion of respondents had obtained a 4-year college degree (29.7%), followed by some college (20.3%). The majority of respondents were white (88.9%).

Table 3  
*Respondent demographics*

	<i>f</i>	%
Gender		
Male	773	38.7
Female	1227	61.4
Age		
18-19	18	0.9
20-29	183	9.2
30-39	240	12.0
40-49	252	12.6
50-59	402	20.1
60-69	578	28.9
70-79	293	14.6
80 and older	34	1.7
Income		
\$24,999 or less	183	9.2
\$25,000-\$49,999	417	20.8
\$50,000-\$74,999	465	23.3
\$75,000-\$149,999	694	34.7
\$150,000-\$249,999	192	9.6
\$250,000 or more	49	2.4
Education		
Less than high school	25	1.3
High school graduate (includes GED)	262	13.1
Some college, no degree	407	20.3
2-year college degree	273	13.7
4-year college degree	594	29.7
Masters' degree	313	15.7
Doctoral degree	51	2.6
Professional degree (JD, MD)	75	3.8
Race/Ethnicity		
American Indiana or Alaska Native	39	2.0

Black or African American	124	6.2
Asian or Pacific Islanders	50	2.5
Hispanic or Latino(a)	210	10.5
White	1778	88.9
Other	41	2.1

Note. Participants were able to select more than one race/ethnicity

*Objective 1: Describe Florida residents' attitudes and elaboration toward fertilizer practices.*

Overall, the respondents held favorable attitudes toward fertilizer practices. Mean attitude scores could range from 1 to 5. While members of the control group who were not exposed to a framed video treatment or goal orientation ( $n = 398$ ) expressed a favorable attitude toward fertilizer practices; when compared to the other treatment groups, they held the lowest mean attitude towards these practices ( $M = 4.68, SD = .54$ ). Those respondents exposed to the video with the personal frame and no goal orientation ( $n = 401$ ) had favorable but slightly lower attitudes ( $M = 4.76, SD = .55$ ) than those exposed to the video with a personal frame and goal orientation ( $n = 401, M = 4.78, SD = .54$ ). Respondents exposed to the video with a social frame and no goal orientation ( $n = 400$ ) had a mean attitude score of 4.78 ( $SD = .52$ ). Respondents that viewed the video with a social frame and goal orientation ( $n = 400$ ) had the highest mean attitude score ( $M = 4.82, SD = .44$ ).

After being exposed to the video treatments, the respondents demonstrated low elaboration across all treatment groups. Elaboration scores could range from 1 to 7. The respondents that viewed the videos with the personal frame exhibited an elaboration mean of 2.79 ( $SD = .92$ ) when accompanied by goal orientation ( $n = 401$ ) and a mean of 2.78 ( $SD = .96$ ) with no goal orientation ( $n = 401$ ). When exposed to the video with a social frame and no goal orientation ( $n = 400$ ), respondents expressed an elaboration mean of 2.76 ( $SD = .89$ ). Respondents that viewed the video with a social frame associated with goal orientation ( $n = 400$ ) demonstrated the highest elaboration ( $M = 2.80, SD = .85$ ). Elaboration was not measured for the control group as they were not exposed to a treatment.

*Objective 2: Compare Florida residents' attitudes toward fertilizer practices among different frame and goal orientation groups after receiving a video message.*

In order to evaluate objective two, the researchers conducted an analysis of variance (ANOVA) to determine if differences existed based on respondents' assigned treatment group. Significant differences in respondents' attitudes toward fertilizer practices were found ( $F(4,1995) = 3.49, p = .008$ ) (Table 4). Even though the results demonstrated significance, the effect size was not very large. The resulting effect size of .007 indicated only 0.7% of the total variance in attitude toward fertilizer practices was accounted for by the treatment effect.

Table 4

*One-Way Analysis of Variance for the Effects of Video Frames and Goal Orientation on Attitudes toward Fertilizer Practices*

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between Groups	3.80	4	.95	3.49	.008*
Within Groups	543.18	1995	.27		
Total	546.99	1999			

Note. \* $p < .01$

To further explore the data, a Bonferroni test was run post hoc. Only significant post hoc assessments are discussed in-text and displayed in Table 5. A significant difference in attitudes was found between respondents receiving the social video and goal orientation (SVGO) and the control group. The mean difference between the two groups ( $\Delta M = .13$ ) was significant ( $p = .003$ ). These results indicated that respondents exposed to the SVGO exhibited a significantly higher attitude toward fertilizer practices than those respondents in the control group with no video frame or goal orientation exposure. No significant differences were found in the attitudes between respondents of the other groups.

Table 5

*Bonferroni Test of the Differences of Attitude toward Fertilizer Practices among the Treatment Groups and Control Group*

<i>Group</i>	<i>(J) Group</i>	$\Delta M(I-J)$	<i>SE</i>	<i>p</i>
Control Group	SVGO Group	-.13	.04	.00*
SVGO Group	Control Group	.13	.04	.00*

Note. \* $p < .01$

*Objective 3: Compare Florida residents' elaboration toward fertilizer practices among different frame and goal orientation groups after receiving a video message.*

Objective three was also evaluated using a one-way ANOVA to determine if differences in elaboration of fertilizer messages existed between the treatment groups. Since the control group was not exposed to a video, elaboration in regard to message exposure was not measured; therefore, the control group was not included in this portion of the analysis. The results of the ANOVA indicated no significant difference existed between elaboration of the treatment groups ( $F(3,1598) = .150, p = .93$ ) (Table 6).

Table 6

*One-Way Analysis of Variance for the Effects of Video Frames and Goal Orientation on Elaboration of Fertilizer Practices*

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between Groups	.37	3	.12	.15	.930
Within Groups	1312.39	1598	.82		
Total	1312.76	1601			

Note. \* $p < .01$

## Conclusions and Recommendations

This study contributes to the literature base by assisting Extension professionals in their efforts to effectively communicate about fertilizer practices. In order to bring about further understanding of effective communication practices in this context, this study sought to assess the influence of video messages on Florida residents' elaboration and attitudes toward fertilizer practices.

Overall, the results indicated that respondents held favorable attitudes toward fertilizer practices; however, the control group held the lowest mean attitude. When considering the treatment groups, of the two videos displaying a personal frame, those exposed to goal-orientation demonstrated a higher attitude. The same held true for the videos showcasing a social frame, the video accompanied by goal-orientation elicited a higher attitude from respondents. Based on these findings, it would appear that the inclusion of a goal-orientation message, regardless of the message frame, has the ability to generate a higher attitude score. Additionally, respondents tended to express higher attitudes after exposure to the socially-framed videos. This finding aligns with prior research from Warner, Rumble, Martin, Lamm, and Cantrell (2015) and Rumble, Lamm, Martin, and Warner (2017). Furthermore, the treatment group with the highest attitude were those who received the video with a social frame and goal-orientation. While these differences in treatment groups were present, it should be noted that a significant difference in attitudes was only found between the control group and the SVGO group.

The existence of significant differences in attitudes held toward fertilizer practices indicated that the framing and goal-orientation of the video message did impact attitudes of respondents. Attitudes of respondents exposed to a video with a social frame and goal-orientation were significantly higher than respondents who did not view a video message and whose exposure was devoid of a personal or social frame and goal-orientation. This indicates that a social frame is a more effective frame for increasing favorable attitudes toward fertilizer practices and providing a goal-orientation message contributes to the effectiveness. The influence of goal-orientation messages corroborated the work of Mackenzie and Spreng (1992).

With demonstrations of low elaboration across the board, it is thought that respondents engaged in peripheral processing of the video messages. This finding is consistent with past work by Rumble, Lamm, Martin, and Warner (2017). This assumption insinuates that resulting attitude change of exposure to the video message would be short-term. It also implies that the attitudes would not be indicative of future fertilizer application behaviors. In order to strengthen the resulting attitudes and increase the likelihood of participants basing future behavioral intention on these attitudes, it is suggested that elaboration motivation variables such as goal orientation and involvement be further explored and utilized.

Extension professionals should consider the use of videos as a medium when communicating about agriculture and natural resources issues, including the promotion of proper fertilizer practices (Perrin, 2011; Qu et al., 2017; Warner, Ali, et al., 2017). Beyond the

utilization of videos, it should be ensured that the accompanying messages are framed properly using value-framing practices. Specifically, to effectively convey the impacts of proper fertilizer application, social frames should be embraced (Rumble et al., 2017). Video messages should also be accompanied by a goal-orientation message to aid in the attitude development and elaboration by viewers (Mackenzie & Spreng, 1992). If possible, socially-framed videos and goal-orientation messages should be partnered in the communication as they are most effective when paired together. It should be noted that these practices will be most effective when paired with other persuasive communication. Extension professionals should thoroughly pilot test any developed communication materials with the intended target audience prior to their wide release. Individuals who conduct trainings and professional development opportunities for Extension professionals should convey this information. The appropriate support and resources should be provided for Extension professionals to utilize social frames and goal-orientation messages in the construction of fertilizer application communication materials.

Additionally, this study established numerous other areas for future research. This study should be replicated with a longitudinal design or repeated exposure to the video messages to assess the impacts on attitudes over time. The effects of videos should also be measured in the context of fertilizer application behaviors. The small effect size produced in this study suggests that further exploration is needed to fully understand the factors at play. Therefore, participants' involvement and knowledge of fertilizer application should be examined, along with additional demographics to distinguish between urban, suburban, and rural residents. Future research should seek to explore variables within the construction of videos, such as video length, music, visuals, and on-screen text. Qualitative methods such as thought listing procedures should be employed to gain greater insight into the elaboration that occurs when exposed to these video messages. Additionally, avenues to increase elaboration and influence the utilization of the central processing route should be examined within the context of agriculture and natural resources issues communication. Future research should seek to understand the relationship between the influence of videos in this context and their dissemination across social media platforms and viewing experiences on various devices. Participants' overall attitudes toward proper fertilizer practices were already high. Therefore, it is recommended that the application of videos should be further explored for other agricultural and natural resource issues where attitudes tend to be less positive.

### References

- Baker, R., Brick, J., Bates, N., Battaglia, M., Couper, M., Dever, J., ... Tourangeau, R. (2013). Summary report of the AAPOR task force on non-probability sampling. *Journal of Survey Statistics and Methodology*, 1(2), 90-143. doi:10.1093/jssam/smt008
- Brewer, P. R. & Gross, K. (2005). Values, framing, and citizens' thoughts about policy issues: Effects on content and quality. *Political Psychology*, 26(6), 964-948. doi:10.1111/j.1467-9221.2005.00451.x
- Bryant, J., & Zillmann, D. (2002). *Media effects: Advances in theory and research*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Cacioppo, J. T., Petty, R. E., Kao, C. F., & Rodriguez, R. (1986). Central and peripheral routes to persuasion: An individual difference perspective. *Journal of Personality and Social Psychology*, *51*(5), 1032-1043. doi:10.1037/0022-3514.51.5.1032
- Carey, R. O., Hochmuth, G. J., Martinez, C. J., Boyer, T. H., Dukes, M. D., Toor, G.S., & Cisar, J. L. (2013). Evaluating nutrient impacts in urban watersheds: Challenges and research opportunities. *Environmental Pollution*, *171*, 138–149. doi:10.1016/j.envpol.2012.10.004
- Carey, R. O., Hochmuth, G. J., Martinez, C. J., Boyer, T. H., Nair, V. D., Dukes, M. D. ...., J.B. Sartain. (2012). A review of turfgrass fertilizer management practices: Implications for urban water quality. *HortTechnology*, *22*(3), 280–291. Retrieved from <http://horttech.ashspublications.org/content/22/3/280.full>
- Dietz, M. E., Clausen, J. C., & Filchak, K. K. (2004). Education and changes in residential nonpoint source pollution. *Environmental Management*, *34*(5), 684–690. doi:10.1007/s00267-003-0238-4
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, *43*(4), 51-58. doi: 10.1111/j.1460-2466.1993.tb01304.x
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Thousand Oaks, CA: Sage.
- Gurhan-Canli, Z., & Maheswaran, D. (2000). Determinants of country-of-origin evaluations. *Journal of Consumer Research*, *27*(1), 96-108. doi: 10.1086/314311
- Hobbie, S. E., Finlay, J. C., Janke, B. D., Nidzgorski, D. A., Millet, D. B., & Baker, L. A. (2017). Contrasting nitrogen and phosphorus budgets in urban watersheds and implications for managing urban water pollution. *Proceedings of the National Academies of Science USA*, *114*(16), 4177–4182. doi:10.1073/pnas.1618536114.
- Keller, K. L. (1991). Cue compatibility and framing in advertising. *Journal of Marketing Research*, *28*(1), 42-57. doi:10.2307/3172725
- Law, N. L., Band, L. E., & Grove, J. M. (2004). Nitrogen input from residential lawn care practices in suburban watershed in Baltimore County, MD. *Journal of Environmental Planning and Management*, *47*(5), 737–755. doi:10.1080/0964056042000274452
- Lazard, A. & Atkinson, L. (2014). Putting environmental infographics center stage: The role of visuals at the Elaboration Likelihood Model's critical point of persuasion. *Science Communication*, *37*(1), 1-28. doi:10.1177/1075547014555997
- Leal, A., Rumble, J. N., & Lamm, A. J. (2015). Setting the agenda: Exploring Florida residents' perceptions of water quality and quantity issues. *Journal of Applied Communications*, *99*(3). doi:10.4148/1051-0834.1058
- Mackenzie, S. B. & Spreng, R. A. (1992). How does motivation moderate the impact of central and peripheral processing on brand attitudes and intentions? *Journal of Consumer Research*, *18*(4), 519-529. Retrieved from <http://www.jstor.org/stable/2489263>
- Milesi, C., Running, S. W., Elvdige, C. D., Dietz, J. B., Tuttle, B. T., & Nemani, R. R. (2005). Mapping and modeling the biogeochemical cycling of turf grasses in the United States. *Environmental Management*, *36*(3), 426–438. doi:10.1007/s00267-004-0316-2

- Perrin, J. (2011). Emotional responses to environmental messages and future behavioral intentions. *Applied Environmental Education & Communication, 10*(3), 146-157. doi:10.1080/1533015X.2011.603612
- Petty, R. E., Brinol, P., & Priester, J. R. (2009). Mass media attitude change: Implications of the Elaboration Likelihood Model of persuasion. In J. Bryant & M.B. Oliver (Eds.), *Media effects: Advances in theory and research* (3rd ed., pp. 125-164). New York, NY: Routledge.
- Petty, R. E. & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (pp. 123-205) New York, NY: Academic Press.
- Qu, S., Lamm, A. J., Rumble, J. N., & Telg, R. W. (2017). The effects of online videos on consumers' attitudes toward local food. *Journal of Applied Communications, 101*(4), 1-20. doi:10.4148/1051-0834.1841
- Reese, S. D., Gandy, O. H., & Grant, A. E. (2001). *Framing public life: Perspectives on media and our understanding of the social world*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Reynolds, R. A. (1997). A validation test of message elaboration measure. *Communication Research Reports, 14*(3), 269-278. doi:10.1080/08824099709388670
- Rumble, J. N., Lamm, A. J., Martin, E. T., & Warner, L. A. (2017). Examining thought processes to understand the impact of water conservation messages on attitude. *Journal of Agricultural Education, 58*(3), 168-184. doi:10.5032/jae.2017.03168
- Shah, D. V., Domke, D., & Wackman, D. B. (1996). To thine own self be true: Values, framing, and voter decision-making strategies. *Communication Research, 23*(5), 509–560. doi:10.1177/009365096023005001
- Shavitt, S., Swan, S., Lowery, T. M., & Wanke, M. (1994). The interaction of endorser attractiveness and involvement in persuasion depends on the goal that guides message processing. *Journal of Consumer Psychology, 3*(2), 137-162. doi: 10.1016/S1057-7408(08)80002-2
- Shen, F. & Edwards, H. H. (2005). Economic individualism, humanitarianism, and welfare reform. A value-based account of framing effects. *Journal of Communication, 55*(4), 795–809. doi:10.1111/j.1460-2466.2005.tb03023.x
- Shober, A. L., Denny, G. C., & Broschat, T. K. (2010). Management of fertilizers and water for ornamental plants in urban landscapes: Current practices and impacts on water resources in Florida. *HortTechnology, 20*(1), 94–106. Retrieved from <http://horttech.ashspublications.org/content/20/1/94>
- Schroeder, J. (2015, August). USFRA nears its 5<sup>th</sup> anniversary. *Agri-Marketing*. Retrieved from <http://www.agrimarketingdigital.com/?iid=125401#folio=42>
- Southwest Florida Water Management District. (2011). *Final 2011 fertilizer pre- and post-advertising campaign survey study*. Retrieved from <https://cfpub.epa.gov/npstbx/files/Kerr%20and%20Downs%20Research%202011.pdf>

- Trenholm, L. E., & Sartain, J. B. (2010). Turf nutrient leaching and best management practices in Florida. *HortTechnology*, 20(1), 107–110. Retrieved from <http://horttech.ashspublications.org/content/20/1/107.short>
- United States Environmental Protection Agency (EPA). (2017). *Polluted runoff: Nonpoint source pollution*. Retrieved from <https://www.epa.gov/nps>
- Warner, L. (2014). Enhancing the capacity to create behavior change: Extension key leaders' opinions about social marketing and evaluation. *Journal of Agricultural Education*, 55(4), 176-190. doi:10.5032/jae.2014.04176
- Warner, L. A., Ali, A. D., & Kumar Chaudhary, A. (2017). Can dissatisfaction relative to perceived importance affect Extension clients' landscape management practices? *Journal of Agricultural Education*, 59(1), 7-20. doi: 10.5032/jae.2018.01007
- Warner, L. A., Kumar Chaudhary, A., Lamm, A. J., Rumble, J. N., & Momol, E. (2017). Using home irrigation users' perceptions to inform water conservation programs. *Journal of Agricultural Education*, 58(3), 101–119. doi:10.5032/jae.2017.03101
- Warner, L. A., Lamm, A. J., & Kumar Chaudhary, A. (2018). Florida residents' perceived role in protecting water quantity and quality through landscape practices. *Landscape and Urban Planning*, 171, 1–6. doi:10.1080/1533015X.2017.1388199
- Warner, L. A., Rumble, J. N., Martin, E., Lamm, A. & Cantrell, R. (2015). The effect of strategic message selection on residents' intent to conserve water in the landscape. *Journal of Agricultural Education*, 56(4), 59-74. doi: 10.5032/jae.2015.04059
- Weinschenk, S. (2011). *100 Things Every Designer Needs to Know About People*. Berkeley, CA: Pearson Education.

**No Discussant Remarks**

## **Determining the Effects of the Smartphone as a Learning Tool on the Motivation of School-Based Agricultural Education Students in Louisiana**

H. Eric Smith, Louisiana FFA Association  
J. Joey Blackburn, Louisiana State University  
Kristin S. Stair, Louisiana State University  
Michael F. Burnett, Louisiana State University

### **Abstract**

*The smartphone is perhaps the most influential device in modern society. Research has indicated students perceived that using smartphones in the classroom aided learning. However, most American high schools ban students from using phones in the classroom. Previous research supports the idea that advanced smartphone applications in student centered learning environments can improve achievement and motivation. Currently, there is little in the agricultural education literature pertaining to smartphone enhanced learning among secondary agriculture students. This study compared motivational differences between non-equivalent comparison groups. Secondary agricultural students from 13 schools across Louisiana completed the Course Interest Survey to measure motivation during a forestry unit. Data were analyzed using Hierarchical Linear Modeling. The analysis rendered no statistically significant differences between the groups in motivation. It was concluded that smartphones do not reduce motivation and should be considered in agricultural education classrooms where policy permits.*

### **Introduction and Literature Review**

In the most recent decade, information and communication technology (ICT) experienced rapid developments lead by the internet capable cellular devices (Christin, Tamin, Santosa, & Miharja, 2014). Specifically, the smartphone has changed our daily lives more than any other technology in the past decade (Romero, 2011) Kaku (2011) stated that smartphones of today even have advanced technology than NASA had in 1969 during the moon landing. Growth in wireless internet has greatly expanded the boundaries of what could be accomplished with a cellular phone. Between 1981 and the present, wireless network speed increased exponentially from first generation analog (1G) to fourth generation long term evolution (4G LTE) (Sharma, 2013). An increase in wireless internet speeds is but one reason that demand for smartphones has increased so dramatically. They have also continued a pattern of offering more power and becoming less expensive over a relatively short period of time (Shuler, 2009). In 2005, there were almost a billion more cellular subscriptions than landline telephone connections (Comer & Wikle, 2008) and smartphones began to replace personal computers almost as soon as the devices were able to access the internet. Sales of smartphones surpassed sales of laptops in 2007 and more people browsed the internet via cellular phone than traditional computers (Romero, 2011). In one tool, the smartphone incorporated all the capabilities of (a) music players, (b) cameras, (c) televisions, (d) Global Positioning Systems, (e) remote controls, (f) gaming consoles, (g) personal computers, and (h) even replaced routers by becoming wi-fi hotspots (Romero, 2011).

Millennials have grown up with a touchscreen mobile device in their hands and therefore rely heavily on technology to study and learn (Prensky, 2001). These students, defined as *digital natives* have been perceived as an academically driven group who required an updated classroom lead by a skilled teacher armed with the most recent educational technology available (Williams, Warner, Flowers, & Croom, 2014). Millennial students are motivated by cutting edge technologies and smartphones have allowed them to utilize technology to foster their creativity (Su & Cheng, 2015).

Secondary and post-secondary students have reported they believed utilizing smartphones for learning increased their academic achievement (Gikas & Grant, 2013). Despite the popularity of smartphones and students' beliefs of their effectiveness, smartphones are often viewed as a distraction by teachers and school administrators (Laskin & Avena, 2015). In fact, Commonsense Media (2010) reported that 69% of school districts in the United States currently ban mobile phones in the classroom. Similarly, Smith, Stair, Blackburn, & Easley (2017) reported that less than one-third of agriculture teachers in Louisiana were employed in school districts where smartphones were allowed in the classroom. However, bans did not effectively stop students from bringing their devices to schools. Students reported that even though they attend a school with a ban on cell phones, most carry them anyway (Lenhart, Ling, Campbell & Purcell, 2010).

The literature is mixed as to the effectiveness of the smartphone as a learning tool (Liu, Scordino, Renata, Navarrete, Yujung, & Lim, 2015; Liu & Huang, 2015; Su & Cheng, 2015). Often only basic functions such as the calendar, clock, and internet access are utilized by educators when smartphones are employed for learning (Thomas & Muñoz, 2016). Smith, Blackburn, Stair, and Burnett (2018) reported no statistically significant differences in the achievement of school-based agricultural education students who learned through the use of a smartphone versus those taught through traditional, printed materials in a forestry unit. However, empirical evidence has also suggested student achievement is increased when more advanced applications, such as (a) creating content, (b) posting information online, and (c) recordings are utilized (Liu et al., 2015; Su & Cheng, 2015).

In addition to achievement, learner motivation has been a variable of interest regarding smartphones in the classroom. Motivation has direct influence on the amount of time a student will dedicate to learning [National Research Council (NRC), 2000]. Therefore, a lack of achievement in the classroom is often linked to a lack of motivation to perform (Dowdall & Colangelo, 1982; Reis & McCoach, 2000; Whitmore, 1982). However, motivation is complex. Students can be motivated through both intrinsic and extrinsic factors and motivation can change over time (Keller, 2010). Motivation encompasses more than classroom engagement, it also includes elements that cross the affective, cognitive, and psychomotor domains and people can be motivated by many sources including but not limited to: (a) emotions; (b) psychomotor characteristics; (c) physiological factors; and (d) cognitive components. (Keller, 2010).

In terms of technology, research has indicated the implementation of the smartphone into the learning process can have a positive impact on student motivation. Specifically, Yamamota and Wakahara (2013) reported an increase in motivation when students were allowed to utilize their smartphones to participate in class activities and access a virtual learning platform. Similarly, Su and Cheng (2015) concluded allowing students to use their smartphones in a

gamified mobile learning system increased motivation to learn the content. Jung (2014) discussed that the ubiquitous nature of the smartphone increased learner satisfaction and motivation. Overall, these factors indicate that technology generally has a positive impact on motivation, despite concerns of smartphone being a distraction to the educational environment. Despite this, there is little discussion on how these technologies can be used more effectively within agricultural education.

### **Conceptual Framework**

This study was conceptually underpinned by the Attention, Relevance, Confidence, and Satisfaction (ARCS) model for measuring learner motivation on a situational basis (Keller, 2010). Keller (1987) postulated students work harder toward activities they perceive are valuable and where success is reachable. Further, motivation has accounted for 16%-38% variance in student achievement scores (Means, Jonassen, & Dwyer, 1997). Keller's (1987) ARCS model is regarded as one of the most respected instructional design models in the United States (Bohlin, 1987). The first construct of the model, Attention, has been related to interest (Keller, 1987). Capturing and maintaining student interest in a learning environment is essential to instructional success and student achievement. "Attention is a combination of some key concepts including: arousal, boredom, and curiosity" (Keller, 2010, p. 76). Being below one's optimal level of arousal due to boredom can be attributed to (a) unpleasantness, (b) constraint, (c) monotony, and (d) repetitiveness (Geiwitz, 1966).

Relevance is a construct best explained in pragmatic terms. Students often question how a lesson or topic of study will be useful in everyday life. Motivation research has suggested that more effective teachers better demonstrated relevance to their students with animated stories that were derived from a deep understanding of the material (Keller, 2010). Communication research supports relevance as the central factor in determining whether or not people respond to a novel stimulus (Sperber & Wilson, 1986). It has been reported people only pay attention to the extent that a connection is found between the stimuli and significance to the subject's personal lives (Sperber & Wilson, 1986). When a person reaches the highest state of perceived relevance they have a heightened interest in a task, they are fully concentrated and unconcerned about success/failure and they experience pleasure while working (Keller, 2010). Those who experienced this heightened state could not be distracted by environmental or psychological forces for an extended period of time (Csikszentmihalyi, 1990).

Confidence is generally aligned with how highly people expected to succeed or fail and how much control over a situation people perceived they have (Keller, 2010). Individual perception of control and predictability strongly relate to the psychological aspects of confidence (Keller, 2010). Rotter (1954) developed the notion of people's perception of control as either internal or external. Individuals with an internal locus of control tend to be more successful academically (DuCette & Wolk, 1974; Dollinger, 2000; Phares, 1976). Keller (2010) recommended teachers build confidence in students by ensuring they understood what was expected and could identify how to maximize their likelihood for success.

Satisfaction was often influenced by one's subjective reflection of a personal outcome compared to societal outcomes (Keller, 2010). People are often not satisfied if they are not achieving the same goals or receiving the same rewards as their peers (Keller, 2010). Festinger

(1957) introduced the idea of cognitive dissonance where dissonance was an uncomfortable state that people will attempt to reduce by achieving equally with their peers. To increase satisfaction, it was recommended that teachers (a) use praise for correct responses liberally, (b) avoid boring tasks and drills, (c) give students personal attention, and (d) avoid the use of threats to get results (Keller, 2010).

No research exists in agricultural education that investigates the motivational characteristics of the smartphone as a learning tool. Many school districts ban the use of smartphones in the classroom (Commonsense Media, 2010; Smith et al., 2017), therefore few accessible population of teachers may exist. Coley, Warner, Stair, Flowers, & Croom (2015) reported that few agriculture teachers in Tennessee even had access to mobile devices to use for learning. Therefore, the principle question that arose from the review of literature was: what effect does utilizing the smartphone for learning have on the motivation of Louisiana school-based agricultural education students? This research aligns with the American Association for Agricultural Education's National Research Agenda Research Priority 4: Meaningful, Engaged Learning in All Environments. Specifically, this study helps to provide answers to Research Priority Question One: "How do digital technologies impact learning in face-to-face and online learning environments?" (Edgar, Retallick, & Jones, 2016, p.39).

### **Purpose of the Study**

The purpose of this study was to compare the motivation (i.e., Attention, Relevance, Confidence, Satisfaction, and overall motivation) of students in a forestry curriculum based on learning through smartphone technology or traditional, printed materials. The following research questions guided the study:

1. Describe the motivation (eg., Attention, Relevance, Confidence, Satisfaction and overall motivation) of Louisiana school-based agricultural education students learning tree identification
2. What differences existed in overall motivation between students learning through smartphone technology and students learning through printed materials?

### **Null Hypothesis**

Ho1: There were no statistically significant differences in Attention, Relevance, Confidence, Satisfaction, and overall motivation between students learning through smartphones and students learning through printed materials.

### **Methods and Procedures**

Data collected for this study were part of a larger study that also sought to compare the achievement differences of students taught utilizing smartphones versus those taught through traditional, printed materials. Therefore the design of this study mirrors Smith et al. (2018). This pre-experimental study design employed nonequivalent comparison groups. (Campbell & Stanley, 1963; Shadish, Cook & Campbell, 2002). Seven agriculture teachers were assigned to the treatment group and fully completed all parts of the study and six were in the comparisons group. The treatment group was comprised of  $n = 128$  and  $n = 135$  students were in the comparison group who were either enrolled in Agriscience I or Agriscience II. These courses are

where an introduction to forestry unit is most commonly taught in Louisiana. Table 1 depicts the personal characteristics of the students as reported in Smith et al. (2018). The majority (73.4%) of the students were male and Caucasian (71.5%). Over 60% of the students were either 15 or 16 years of age.

Table 1

*Personal Characteristics of Louisiana Students Enrolled in Secondary Agriculture Classes Offering a Forestry Curriculum in the Fall of 2016 (n = 263)*

Variable	f	%
Gender		
Male	193	73.4
Female	70	26.6
Age		
13	10	3.8
14	37	14.1
15	77	29.3
16	82	31.2
17	44	16.7
18	12	4.6
19	1	0.4
Ethnicity		
Caucasian	188	71.5
African-American	51	19.5
Asian	3	1.1
American Indian	3	1.1
Hispanic	9	3.4
Other	9	3.4

Neither random sampling nor random assignment were utilized in this study due to the small number of school districts with policies that allowed the use of smartphones in the class. Approximately 30% of school districts in Louisiana allow the use of smartphones for learning (Smith et al. (2018)). Since randomization was not employed pretreatment equivalence was not assumed. Smith et al. (2018) reported no differences in content knowledge as measured on a 30-item pretest.

### **Participants Recruitment of and Training**

Agriculture teachers in Louisiana were invited to participate in this study as a member of the treatment group if they met the following criteria: (a) volunteered to participate; (b) taught high school courses; (c) taught 50 minute periods; and (d) were employed in a district with a policy that allowed the use of smartphones in the classroom. Comparison group teachers only had to meet the first three criteria. A total of 16 teachers were identified for the treatment group and 14 were identified for the comparison group. The 30 teachers were invited to attend a workshop during the 2016 Louisiana Agriscience Teachers' Association summer conference and 22 attended.

The beginning of the workshop focused on basic leaf identification (i.e., leaf parts, leaf arrangements, leaf margins, and leaf types). During the second phase of the workshop, teachers were separated by treatment ( $n = 10$ ) and comparison ( $n = 12$ ) groups. The teachers in the treatment group were taught how to employ two smartphone applications, LeafSnap® and V-tree, to identify 30 species of trees native to Louisiana. The treatment group was also taught how to employ Quizlet to formatively assess students. The comparison group teachers were taught how to utilize traditional, printed materials (e.g., field guides) to identify the same 30 tree species. This group was provided paper flashcards to engage students in formative assessment. The groups were then brought back together and taught how to utilize Test Generator (TG) Web© to assess students' leaf identification knowledge.

A second workshop was initially scheduled for late summer of 2016, however this workshop was cancelled due to [natural disaster] that affected a large portion of Louisiana. Small group and individual training sessions were utilized to replace the second workshop. This training focused on how to (a) follow the study protocol, (b) employ the smartphone applications (treatment group) or printed materials (comparison group), and (c) employ guided inquiry to teach the lessons. All teachers received between two and three hours of training to teach the lessons. Fidelity of the treatment was ensured by having teachers complete daily logs, which were returned at the end of the study. All data were collected between September 19, 2016 and September 27, 2016 for a total of seven instructional days. Table 2 provides a summary of the procedures utilized by both groups of teachers Smith et al. (2018).

Table 2

*Instructional Procedures Utilized by the Treatment and Comparison Groups*

Instructional Day	Specific Tasks Completed
1	Pre-test of tree leaf identification; download applications
2	Lesson on the Importance of Forestry and Leaf Identification Terminology
3	Identification of tree leaf samples; formative assessment
4	Identification of tree leaf samples; formative assessment
5	Identification of tree leaf samples; formative assessment
6	Identification of tree leaf samples; formative assessment
7	<sup>a</sup> Course Interest Survey Administered; <sup>b</sup> Post-Test of tree leaf identification

Note. <sup>a</sup>Data utilized in the current study. <sup>b</sup>Data reported in Smith et al., (2018);

**Instrumentation**

Student motivation was assessed with the Course Interest Survey (CIS) created by Keller (2010). The overall goal for the CIS is to assess how motivated students are with respect to a specific lesson or class being taught. Keller (2010) discussed that the CIS is not a general measure of motivation, but a situation specific instrument. The instrument contained 34 items, which measured the four subscales of the ARCS model. The Likert-type items recorded student levels of agreement using a five-point scale (1 = Not True; 2 = Slightly True; 3 = Moderately True; 4 = Mostly True; 5 = Very True). All students in the study completed the instrument online immediately before they completed the post-test. Keller (2010) reported all reliability coefficients for the subscales of the CIS were between  $\alpha = 0.81$  and  $\alpha = 0.95$ , therefore a pilot

study was not conducted. Post-hoc reliability analysis for this study yielded  $\alpha = 0.78$  for Attention,  $\alpha = 0.84$  for Relevance,  $\alpha = 0.71$  for Confidence, and  $\alpha = 0.81$  for Satisfaction.

### Data Analysis

Data associated with the first research objective were analyzed through measures of central tendency, specifically the mean and standard deviation. Keller (2006) outlined scoring procedures for the CIS, and included utilizing the mean for the subscales and overall motivation. It should be noted that some negatively worded items required reverse coding so that a higher mean indicated increased motivation.

The second research objective sought to determine if differences existed in student motivation between students who learned through smartphone technology and students who learned through printed materials. To accomplish this goal, hierarchical linear modeling (HLM) was employed. The independent variable was group (i.e., treatment or control). The dependent variables were the four constructs measured by the CIS (i.e., Attention, Relevance, Confidence, and Satisfaction) as well as overall Motivation. An intraclass correlation coefficient (ICC) was calculated ( $ICC = 9.4\%$ ) to ensure HLM was appropriate for the nested data. ICC values ranging from 5% to 20% warrant social sciences research to employ HLM (Muthén, 1994; Raudenbush & Bryk, 2002; Peugh, 2010). After calculating the ICC from the unconditional model, the HLM technique had three steps. The first step produced the level one model which measured student differences in each DV at the school level. The second step produced the full model which measured group level outcomes on the DV nested in schools. The third step utilized likelihood ratio testing to determine if adding a school level variable improved the level one model. This model building process was necessary to determine if adding school level effects improved the model. Most importantly, step two (full model) specifically addressed research question number two. The final analysis conducted on all variables in the model consisted of a treatment group ( $n = 128$ ) and a comparison group ( $n = 135$ ) that completed the CIS instrument after the learning process was completed.

### Findings

Research question one sought to describe the motivation of Louisiana school-based agricultural education students who learned leaf identification through smartphone technology and those taught through traditional, printed materials (see Table 4). For both the treatment group ( $M = 3.24$ ;  $SD = 0.79$ ) and comparison group ( $M = 3.42$ ;  $SD = 0.79$ ) means for Attention were in the real limits of Moderately True. Treatment group means for Relevance ( $M = 3.52$ ;  $SD = 0.85$ ), Confidence ( $M = 3.86$ ;  $SD = 0.69$ ), and Satisfaction ( $M = 3.55$ ;  $SD = 0.82$ ) fell in the real limits of Mostly True. Similarly, comparison group means for Relevance ( $M = 3.60$ ;  $SD = 0.80$ ), Confidence ( $M = 3.93$ ;  $SD = 0.68$ ), and Satisfaction ( $M = 3.61$ ;  $SD = 0.81$ ) fell in the real limits of Mostly True. The overall motivation for the treatment group ( $M = 3.54$ ;  $SD = 0.71$ ) and comparison group ( $M = 3.64$ ;  $SD = 0.69$ ) were in the real limits of Mostly True.

Table 3

*Attention, Relevance, Confidence, Satisfaction and Overall Motivation of the Treatment (n=128) and Comparison Group (n = 135)*

Construct	M	SD
Attention		
Treatment Group	3.24	0.79
Comparison Group	3.42	0.79
Relevance		
Treatment Group	3.52	0.85
Comparison Group	3.60	0.80
Confidence		
Treatment Group	3.86	0.69
Comparison Group	3.93	0.68
Satisfaction		
Treatment Group	3.55	0.82
Comparison Group	3.61	0.81
Overall Motivation		
Treatment Group	3.54	0.71
Comparison Group	3.64	0.69

Note. Real Limits 1.00–1.49 = Not True; 1.50–2.49 = Slightly True; 2.50–3.49 = Moderately True; 3.50–4.49 = Mostly True; 4.50–5.00 = Very True

The second research question sought to determine if differences existed in overall motivation between students who learned with smartphones and those who learned with printed materials. The level one predictor for Motivation was the grouping variable (treatment or comparison). The intercept in this model was based on the fixed effects and was the treatment group mean (120.5). There was no statistically significant difference ( $p > .05$ ) in overall motivation (see Table 4) between the treatment ( $n = 128$ ) and comparison group ( $n = 135$ ) at level one ( $\gamma_{00} = 3.18$ ,  $SE = 2.95$ ,  $t = 1.10$ ,  $df = 263$ ,  $F = 1.17$  and  $p = .281$ ).

Table 4

*Level One Model for Overall Motivation between Treatment and Comparison group before accounting for individual differences*

Fixed effects	Coefficient (SE)	t (df)	F (p)
Level one model			
Intercept ( $\mu_j$ mean)	120.5 (2.11)	57.0 (263)	6853.4 (.000)
Group ( $\sigma_j$ ) variance nested in school ( $\gamma_{00}$ )	3.18 (2.95)	1.10 (263)	1.17 (.281)

Note: Deviance (maximum likelihood)  $\chi^2 = 2415.8$ ; three estimated parameters.

The full model analyzed overall motivation between groups as a function of school (see Table 5). The new intercept estimate (120.2) was the mean for the treatment group adjusted for individual differences by school. There was no statistically significant difference ( $p > .05$ ) in motivation between the nested treatment ( $n = 128$ ) and comparison group ( $n = 135$ ) at level two ( $\beta_{0j} = 1.04$ ,  $SE = 5.94$ ,  $t = .176$ ,  $df = 11$ ,  $F = .031$  and  $p = .864$ ). The critical value for  $\chi^2$  ( $df = 1$ ) was 6.63 ( $p < .01$ ). The -2LL ratio test between the models yielded statistically significant

differences when the variance due to group was confounded with the variance due to school ( $X^2 = 15.1, df = 1, p < .01$ ).

Table 5

*Full Model for Motivation between the Treatment and Comparison Group After Adjusting for Individual Student Differences as a Function of School*

Fixed effects	Coefficient (SE)	t (df)	F (p)
Intercept (adjusted $\beta_{ij}$ mean) <sup>a</sup>	120.2 (4.11)	29.2 (12)	1648.7 (.000)
Group ( $\beta_{0j}$ ) variance nested in schools	1.04 (5.94)	.176 (11)	.031 (.864)

Note: Deviance (maximum likelihood) = 2400.7; four estimated parameters, fixed effect was group (IV) and random effect was school (subject)

### Conclusions

After analyzing the results from the CIS, it can be concluded that these students were, overall, motivated to learn tree leaf identification regardless of whether they were taught through smartphone technology or printed materials. Regarding the CIS subscales, both groups of students believed the content was relevant. These students were also confident they could be successful. Further, both groups of students felt satisfaction with the unit of instruction, regardless of how they were taught. However, both groups of students perceived attention as the lowest of the subscales. The mean of the attention subscale was not low enough to conclude the students were not interested. However, the attention subscale was not rated high enough to confidently conclude these students were highly interested in the topic of leaf identification.

HLM analysis of data concerning students using smartphones to improve learner motivation failed to provide a statistically significant difference when compared to students using printed materials as determined on a multilevel analysis of motivation. Consequently, we failed to reject to null hypothesis. Therefore, it can be concluded that utilizing smartphone technology to teach tree identification does not influence a student's motivation, positively nor negatively. This conclusion contradicts previous research that indicated learner motivation was increased when smartphones were implemented for learning (Burns-Sardone, 2014; Jung, 2014; Hwang & Chang, 2011; Lin-Siegler, Dweck & Cohen, 2016; Liu & Huang 2015; Su & Cheng, 2015; Yamamota & Wakahara, 2013).

### Discussion and Implications

While research in the educational literature regarding smart phone usage and effectiveness is mixed, anecdotal evidence supported the broad education literature that smartphones increase students' motivation to learn (Burns-Sardone, 2014; Jung, 2014; Hwang & Chang, 2011; Lin-Siegler, Dweck & Cohen, 2016; Liu & Huang 2015; Su & Cheng, 2015;

Yamamoto & Wakahara, 2013). However, this research study indicated there were no differences in motivation when smartphones were employed for tree identification.

One important note was that the CIS subscale of Attention was rated lower than the other components of the instrument. This begs the question *Why?* Keller (2000) discussed that one element of attention is variation. Perhaps the repetitive nature of learning tree leaves and being formatively assessed each day caused the students to lose interest and subsequently rate attention lower than the other constructs. It is possible that attention would have been rated higher if the leaf identification curriculum had been designed to include a wider variety of activities. Though not statistically significant, the comparison group reported slightly higher motivation scores on all four CIS subscales. It is unclear what, if any, aspects of the lessons may account for those possible changes.

Keller's ARCS model is highly focused on how Attention relates to interest (Keller, 1987). If gaining and maintain attention is key to instructional success and student achievement, then these students may have been too accustomed to using their phones in class. None of the treatment group schools were in their first year of smartphone use, therefore, the novelty effect of using smartphones for learning may have been less impactful than if smartphone use was being implemented for the first time in the classroom. Perhaps these digital natives (Prensky, 2001) were desensitized to the smartphone and its effectiveness as a motivator was negated. Feasibly, this research may be reinforcing the notion that *good teaching is good teaching* and the employment of smartphones, like other educational technologies, is not a magic solution, but rather one more pedagogical tool for teachers to utilize.

The nature of students using smartphones also makes it difficult to truly measure how they may have directly impacted learning. For any new technology, there are barriers to implementation. The time to download and gain familiarity with the smartphone applications was part of the research protocol that was not included for students in the comparison group. Teachers in the treatment group could have been faced with integration barriers such as student skill level, lack of time to plan, and technical support (Kotrlik, Redmann, & Douglas, 2003; Coley et al., 2015) that decreased their perceived value of using the specific apps used in this study. If so, a negative impact to student motivation may have developed during the course of the study.

### **Recommendations**

Future research should utilize the CIS at multiple points during the data collection process, similar to the work of Bunch (2012). This would allow for a baseline measure of motivation across the ARCS subscales to determine if, or how, motivation changes throughout a unit of instruction. Further, future studies should incorporate the ARCS model of planning (Keller, 2000) in conjunction with utilizing smartphone technology in the classroom.

The findings of this study provide a very robust statistical analysis that failed to find significant differences in motivation between students who used smartphones and those who did not use smartphones. Most importantly, the findings suggest that smartphones are a valid learning tool because they do not diminish motivation. Agricultural educators can therefore be

more confident in incorporating smartphones into their teaching practice without reservations of its effectiveness.

Further research should more closely examine the process and reactions of student groups while using smartphones in class. There were many unanswered questions as a result of this study. Additional research, perhaps through qualitative inquiry can better examine student reactions and perceptions of smartphone usage in the classroom. It is also possible that because the lessons were so carefully constructed, that students were equally engaged. Additional analysis of student reaction could help gain insight of their attention and motivation throughout the learning process.

More research should be conducted to understand how the motivation of using smartphones changes over time. While previous studies have suggested that that smartphones increase engagement, they are also dated in terms of smartphone advancements and technology. A greater understanding of how students considered to be digital natives perceive smartphone usage is critical to better understand their effectiveness in agricultural education and all areas of secondary education.

### **Limitations**

The following limitations should be considered:

1. Full power of random assignment was not utilized to select participating schools; therefore generalizability cannot extend beyond the participants in the study.
2. Variability, such as competence/interest in forestry or time of day forestry was taught, may have existed between schools in the study. Teacher effect may also be a limitation as factors such as years of experience, enthusiasm, and knowledge about forestry may have impacted teacher performance.
3. Non-treatment related variability, such as student background, prior knowledge or some other construct may have existed between the treatment and comparison groups.

### **References**

- Adams, J. S. (1965). Inequity in social exchange. *Advances in experimental social psychology*, 2, 267–299. doi: 10.1016/S0065-2601(08)60108-2
- Bandura, A. (1977). Self efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215. doi: 10.1037/0033-295X.84.2.191
- Berlyne, D. E. (1954). A theory of human curiosity. *British Journal of Psychology*, 45(3), 180–191. doi: 10.1111/j.2044-8295.1954.tb01243.x
- Bohlin, R. M. (1987). Motivation in instructional design: Comparison of an American and a Soviet model. *Journal of Instructional Development*, 10(2), 11–14. doi: 10.1007/bf02905786

- Bunch, J. C. (2012). *The effects of a serious digital game on the animal science competency, mathematical competency, knowledge transfer ability, and motivation of secondary agricultural education students* (Unpublished doctoral dissertation). Oklahoma State University, Stillwater, OK.
- Burns-Sardone, N. (2014). Making a case for BYOD instruction in teacher education. *Issues in Informing Science and Technology*, 11(1), 192–200. Retrieved from <http://iisit.org/Vol11/IISITv11p191-201Sardone0505.pdf>
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental design for research*. Chicago, IL: Rand McNally & Company.
- Christin, G. N., Tamin, O. Z., Santosa, I., & Maharja, M. (2014). Adjustment of daily activities: The influence of smartphone adoption on the travel patten of mobile professionals in the greater Jakarta area. *Journal of Engineering and Technological Sciences*, 46(4), 394–409. doi: 10.5614/j.eng.technol.sci.2014.46.4
- Coley, M. D., Warner, W. J., Stair, K. S., Flowers, J. L., & Croom, D.B. (2015) Technology usage of Tennessee agriculture teachers. *Journal of Agricultural Education* 56(3), 35–51. doi: 10.5032/jae.2015.03035
- Comer, J. C., & Wikle, T. A. (2008). Worldwide diffusion of the cellular telephone, 1995–2005. *Professional Geographer*, 60(2), 252–269. doi: 10.1080/00330120701836303
- CommonSense Media. (2010). *Hi-tech cheating: Mobile phones and cheating in schools: A national poll*. Retrieved from <https://www.commonsensemedia.org/blog/cheating-goes-hi-tech>
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper and Row.
- Dollinger, S. J. (2000). Locus of control and incidental learning: An application to college student success. *College Student Journal*, 34(4), 537–540. Retrieved from <https://www.questia.com/library/journal/1G1-69750050/locus-of-control-and-incidental-learning-an-application>
- Dowdall, C. B., & Colangelo, N. (1982). Underachieving gifted students: Re-view and implications. *Gifted Child Quarterly*, 26, 179-184.
- DuCette, J., & Wolk, S. (1973). Cognitive and motivational correlates of generalized expectancies for control. *Journal of Personality and Social Psychology*, 26(3), 420–426. doi: 10.1037/h0034486
- Edgar, D. W., Retallick, M. S., & Jones, D. (2016). Research priority 4: Meaningful, engaged learning in all environments. In T. Roberts, A. Harder, & M. Brashears (Eds.), *American Association for Agricultural Education National Research Agenda* (pp. 37–40). Retrieved

from

[http://aaaeonline.org/resources/Documents/AAAE\\_National\\_Research\\_Agenda\\_2016-2020.pdf](http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf)

- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Geiwitz, J. P. (1966). Structure of boredom. *Journal of Personality and Social Psychology*, 3(5), 592–600. doi: 10.1037/h002302
- Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *Internet and Higher Education*, 19, 18–26. doi: 10.1016/j.iheduc.2013.06.002
- Huett, J. B., Moller, L., Yyoung, J., Bray, M., & Huett, K. C. (2008). Supporting the distant student: The effects of the ARCS-based strategies on confidence and performance. *Quarterly Review of Distance Education*, 9(2), 113–126, 219–221. Retrieved from <https://eds.a.ebscohost.com/eds/pdfviewer/pdfviewer?vid=0&sid=5c685e02-d6f7-41e1-845c-ae2d4bb34cda%40sessionmgr4008>
- Hwang, G., & Chang, H. (2011). A formative assessment-based mobile learning approach to improving the learning attitudes and achievements of students. *Computers & Education*, 56(4), 1023–1031. doi: 10.1016/j.compedu.2010.12
- Jiao, H. (2015). Enhancing students' engagement in learning through a formative e-assessment tool that motivates students to take action on feedback. *Australasian Journal of Engineering Education*, 20(1), 9–18. doi:10.7158/D13-002.2015.20.1
- Jung, H. J. (2014). Ubiquitous learning: Determinants impacting learners' satisfaction and performance with smartphones. *Language Learning & Technology*, 18(3), 97–119. Retrieved from [https://scholarspace.manoa.hawaii.edu/bitstream/10125/44386/1/18\\_03\\_jung.pdf](https://scholarspace.manoa.hawaii.edu/bitstream/10125/44386/1/18_03_jung.pdf)
- Kagan, J. (1972). Motives and development. *Journal of Personality and Social Psychology*, 22(1), 51–66. doi: 10.1037/h0032356
- Kaku, M. (2011). *Physics of the future: How science will shape human destiny and our daily lives by the year 2100*. New York, NY: Anchor Books.
- Keller, J. M. (1987). Development and use of the ARCS model of instructional design. *Journal of Instructional Development*, 10(3), 2–10. doi: 10.1007/BF02905780
- Keller, J. M. (2010). *Motivational design for learning and performance: The ARCS model approach*. New York, NY: Springer.
- Kotrlik, J. K., Redmann, D. H., & Douglas, B. B. (2003). Technology integration by agriscience teachers in the teaching/learning process. *Journal of Agricultural Education* 44(3), 78–90. doi: 10.5032/jae.2003.03078

- Laskin, A. V., & Avena, J. (2015). Introduction of mobile media into formal classroom learning environments. *Journalism & Mass Communication Educator*, 70(3), 276–285. doi:10.1177/1077695815601170
- Lin-Siegler, X., Dweck, C. S., & Cohen, G. L. (2016). Instructional interventions that motivate classroom learning. *Journal of Educational Psychology*, 108(3), 295–299. doi:10.1037/edu0000124
- Liu, M. C., & Huang, Y. M. (2015). Collaborative experience sharing with the support of M-Learning 2.0: A fundamental framework, a case study and research issues. *International Journal of Mobile Learning and Organisation*, 9(1), 21–37. doi: 10.1504/ijmlo.2015.069711
- Liu, M., Scordino, R., Renata, G., Navarrete, C., Yujung, K., & Lim, M. (2015). A look at research on mobile learning in K-12 education from 2007 to the present. *Journal of Research on Technology in Education*, 46(4), 325–372. doi: 10.1080/15391523.2014.925681
- Lenhart, A., Ling, R., Campbell, S., & Purcell, K. (2010). Teens and mobile phones. *Pew Research Center*. Retrieved from <http://pewinternet.org/Reports/2010/Teens-and-Mobile-Phones.aspx>
- Lewin, K. (1944). A Research Approach to Leadership Problems. *The Journal of Educational Sociology*, 17(7), 392-398. doi:10.2307/2262546
- Madden, M., Lenhart, A., Duggan, M., Cortesi, S., & Gasser, U. (2013). Teens and technology 2013. *Pew Research Center*. Retrieved from <http://pewinternet.org/Reports/2013/Teens-and-Tech.aspx>
- Maw, E. W., & Maw, W. H. (1964). *An exploratory investigation into the measurement of curiosity in elementary school children* (Report No. 801). Washington D.C., Department of Education.
- Means, T., Jonassen, D., & Dwyer, F. (1997). Enhancing relevance: Embedded ARCS strategies vs. purpose. *Educational Technology Research and Development*, 45(1), 5–17. doi: 10.1007/bf02299610
- Muthén, B. O. (1994). Multilevel covariance structure analysis. *Sociological Methods and Research*, 22(3), 376–398. doi: 10.1177/004912419022003006
- National Research Council (2000). *How people learn*. Washington D.C.: National Academy Press.
- Peugh, J. L. (2010). A practical guide to multilevel modeling. *Journal of School Psychology*, 48(1), 85–112. doi: 10.1016/j.jsp.20.09.09.002
- Phares, E. J. (1976). *Locus of control in personality*. Morristown, NJ: General Learning Press.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon* 9(5), 1–6. doi: 10.1108/10748120110424816

- Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods*. Chicago, IL: Sage Publications Ltd.
- Reis, S. M., & McCoach, D. B. (2000). The underachievement of gifted students: What do we know and where do we go?. *Gifted Child Quarterly*, 44(3), 152–170. doi: 10.1177/001698620004400302
- Romero, J. J. (2011). *NO. 1 Smartphones*. IEEE Spectrum, 48(1), 28-31.
- Rotter, J. B. (1954). *Social learning theory and clinical psychology*. New York, NY: Prentice-Hall.
- Schunk, D. H. (1996). Goal an self-evaluation influences during children’s cognitive skill learning. *American Educational Research Journal*, 33(2), 359 – 382. doi: 10.3102/00028312033002359
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton, Mifflin and Company.
- Sharma, P. (2013). Evolution of mobile wireless communication networks-1G to 5G as well as future prospective of next generation communication network. *International Journal of Computer Science and Mobile Computing*, 2(8), 47–53. Retrieved from <https://pdfs.semanticscholar.org/8e32/4078c7b0848c5e8c573861878cdbe417e89e.pdf>
- Shuler, C. (2009). *Pockets of potential: Using mobile technologies to promote children's learning*. New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.
- Smith, H. E., Blackburn, J. J., Stair, K. S., & Burnett, M. F. (2018). Assessing the effects of the smartphone as a learning tool on the academic achievement of school-based agricultural education students in Louisiana. *Journal of Agricultural Education*, 59(4). doi: 10.5032/jae.2018.04270
- Smith, H. E., Stair, K. S., Blackburn, J. J., & Easley, M. (2018). Is there an app for that? Describing smartphone availability and educational technology adoption level of Louisiana school-based agricultural educators. *Journal of Agricultural Education*, 59(1), 238–254. doi: 10.5032/jae.2018.10238
- Sperber, D., & Wilson, D. (1986). *Relevance: communication and cognition*. Cambridge, MA: Harvard University Press.
- Su, C. H., & Cheng, C. H. (2015). A mobile gamification learning system for improving the learning motivation and achievements. *Journal of Computer Assisted Learning*, 31(3), 268–286. doi: 10.1111/jcal.12088
- Thomas, K., & Muñoz, M. A. (2016). Hold the phone! High school students' perceptions of mobile phone integration in the classroom. *American Secondary Education*, 44(3), 19–37. Retrieved from <http://eds.b.ebscohost.com/eds/pdfviewer/pdfviewer?sid=bf89607f-cfa8-4db4-8dc6-2f894d47e42f%40sessionmgr120&vid=2&hid=114>

- Tolman, E. C., Hall, C. S., & Bretnall, E. P. (1932). A disproof of the law of effect and a substitution of the laws of emphasis, motivation and disruption. *Journal of Experimental Psychology*, 15(6), 601-614. doi: 10.1037/h0073609
- Traxler, J. (2007). Defining, discussing and evaluating mobile learning: The moving finger writes and having written. *International Review of Research in Open and Distance Learning*, 8(2). doi: 10.19173/irrodl.v8i2.346
- Whitmore, J. R. (1982). Recognizing and developing hidden giftedness. *The Elementary School Journal*, 82(3), 274–283. doi: 10.1086/461265
- Williams, M. R., Warner, W. J., Flowers, J. L., & Croom, D. B. (2014). Accessibility and usage of technology by North Carolina agriculture teachers. *Journal of Agricultural Education* (55)4, 191–205. doi: 10.5032/jae.2014.04191
- Yamamoto, N., & Wakahara, T. (2013). An interactive learning system using smartphone for improving students' learning motivation. *Proceedings of the 2013 Information Technology Convergence*, 305–310. doi: 10.1007/978-94-007-6996-0\_32

### **Discussant Remarks**

## **Determining the Effects of the Smartphone as a Learning Tool on the Motivation of School-Based Agricultural Education Students in Louisiana**

Discussant: Brian E. Myers, Professor and Chair, University of Florida

This issue of smartphone use in schools is most certainly one that often comes up when talking to any group of teachers. I commend the authors on conducting quality research on a pressing issue in the school-based agricultural education classroom. The methods and analysis used in this study are appropriate and were carried out in a quality fashion.

Below I've provided a few a questions/thoughts for you to consider.

1. In the introduction, you cite a study from 2010 stating that 69% of school districts ban the use of phones. You follow that up with a citation of a 2017 study specific to Louisiana agriculture teachers showing limited access to phones. Since the adoption of technology changes rapidly, do you believe there have been any changes in the general school policy philosophy regarding smartphone use by students in 2019? If so, how?
2. You mention the possible “novelty effect” of using smartphones. What recommendations do you have to assist teachers in transitioning the use of smartphones from novelty to instructional tool?
3. In the selection and creation of the instructional tools (flashcards, smartphone apps, etc.), what guidelines or standards did you use to determine if these tools were appropriate and designed to aid in instruction? How could the quality of the tool and/or original purpose of the tool impact student motivation and learning effectiveness?
4. You appropriately concluded that smartphone use “did no harm” to student motivation. Thus you recommended the use of smartphones in instruction. Couldn't it as easily been recommended that since smartphone use didn't increase student motivation that smartphones should not be used? What other factors should teachers, administrators, and school policy makers consider when deciding on the use of smartphones in schools?
5. How should your findings and those upon which you built your study be used by teacher educators in the preparation of new agriculture teachers and the professional development of current agriculture teachers?

# Identifying the Characteristics Necessary for Becoming an Effective Agricultural Education Teacher: A National Study

Christopher J. Eck, Oklahoma State University  
J. Shane Robinson, Oklahoma State University  
Jon W. Ramsey, Oklahoma State University  
Ki Lynn Cole, Oklahoma State University

## Abstract

*The educational landscape is changing everyday. Yet, the need for effective teachers, especially those in agricultural education, is paramount. This national study sought to identify the human capital (i.e., education, training, skills, and experiences) necessary for effective school-based agricultural education teachers. The modified Delphi approach consisting of award-winning agricultural education teachers, state staff, and National FFA Board of Directors in the 2017 calendar year was used to collect data. Three rounds of data collection resulted in 58 characteristics, across eight different categories, reaching consensus of agreement. Panelists agreed unanimously on 28 items, the top-rated being “understands student needs.” The eight categories emerging from the data included: Instruction, FFA, SAE, Program Planning, Balance, Diversity and Inclusion, Professionalism, and Personal Dispositions. Personal Dispositions (n = 14) and Instruction (n = 14) were the two themes with the greatest numbers of items generated. SAE (n = 1) was the category with the least amount of items generated.*

## Introduction

Today’s education system is ever-changing. However, the one thing that remains constant is the need for effective teachers in K-12 school systems (U.S. Department of Education, n.d.). The No Child Left Behind Act (Law 107-110, 2001) shed light on the need for effective classroom instruction, as it aimed to provide highly qualified teachers in all K-12 classrooms nationwide (U.S. Department of Education, n.d.). Effective teaching is important because of its positive impact on student achievement (Farrell, 2015; McNeil & Popham, 1973; Rockoff, 2004; Steele, 2010). However, recruiting and retaining effective teachers nationwide continues to be a struggle in all disciplines of public schools (Boyd, Grossman, Hammerness, Lankford, Loeb, Ronfeldt, & Wyckoff, 2012) including agricultural education (Smith, Lawver, & Foster, 2018).

Fortunately, the demand for agricultural education teachers continues to grow. Unfortunately, the supply of certified school-based agricultural education (SBAE) teachers continues to be an issue. The National Supply and Demand Study for agricultural education teachers reported that 122 programs went unfilled in 2017 due to teacher shortage. The National FFA Organization (2017) identified the shortage of qualified teachers as being the greatest challenge facing agricultural education. To accommodate the shortage, states have turned to alternative certification (Bowling & Ball, 2018). The numbers of alternatively certified teachers in agricultural education has increased steadily since the turn of the century (Kantrovich, 2010; Smith et al., 2018). As a result, “school districts are hiring an unprecedented number of alternatively certified and non-licensed teachers to fill open positions due to demand” (Smith et al., 2018, p. 1).

Although alternative certification has helped ease the issue of the teacher shortage, and has been viewed as a potential solution to the problem (Bowling & Ball, 2018), especially due to teachers' former experiences in industry (Robinson, 2010), a dearth of research exists regarding its effectiveness as a long-term solution. In a study of teacher performance, Robinson and Edwards (2012) found that first-year alternatively certified teachers in Oklahoma had higher levels of teacher self-efficacy than their traditionally certified counterparts. However, when compared on teaching performance indicators, traditionally certified teachers were statistically significantly better, especially in the areas of lesson planning and assessment (Robinson & Edwards, 2012).

“Recruiting and preparing high-quality teachers to meet the demand of K-12 schools is a massive undertaking” (Boyd et al., 2012, p. 1043). Roberts and Dyer (2004) attributed much of the stressors in today's educational environment to strict graduation requirements, high-stakes testing, and school grades, all of which “are indicative of an increased emphasis on student and teacher performance” (p. 82).

Effective teaching can be identified in various ways, as it is a multidimensional concept (Farrell, 2015). Steele (2010) discussed three characteristics associated with effective teaching, (1) nonverbal communication, (2) teacher self-efficacy, and (3) servant leadership. Darling-Hammond (2002) stressed that effective teachers are those who understand their students as individuals by building rapport and relationships with them. Five key characteristics of effective teaching are described by Rosenshine and Furst (1971), including: clarity, variability, enthusiasm, task-oriented business-like behavior, and the opportunity to learn criterion material. The United States Department of Education (n.d.) defined the attributes of an effective teacher as one who has passed the state certification examination(s), holds a minimum of a bachelor's degree, and demonstrates expertise within a given subject matter. Although, these characteristics are relevant to effective teaching, none of them speak directly to the roles of a SBAE teacher.

SBAE teachers' responsibilities revolve around the three-component model of agricultural education (National FFA, 2018), delivering a complete program through “(1) classroom/laboratory instruction (contextual learning), (2) supervised agricultural experience programs (work-based learning), and (3) student leadership organizations (National FFA organization)” (National Council for Agricultural Education, 2012, para. 4). This complete model of an agricultural education program leads to teachers “working well over a 40 hour week, every week” (Lambert, Ball, & Tummons, 2011, p. 59), aligning with the recommendations of Torres, Ulmer, and Aschenbrener (2008), looking into the excess number of hours focused on tasks associated with the profession. Harper, Weiser, and Armstrong (1990) identified the need to conduct further research of SBAE teachers to determine the factors associated with effective teaching. The concept of a complete SBAE program involves a more in-depth analysis of effective teaching characteristics, such as those identified by Roberts and Dyer (2004). Forty characteristics spanning eight categories were identified (Roberts & Dyer, 2004), including, instruction, FFA, SAE, community relations, marketing, professionalism/professional growth, program planning/management, and personal qualities. Davis and Jayaratne (2015) concluded that for SBAE teachers to be effective in the 21st century they need a basic understanding of leadership, the ability to integrate math, reading, and writing into their curriculum, diverse teaching techniques, and the use of critical and higher order thinking skills. The National Council for Agricultural Education (2001) developed *The Nationwide Strategic Plan and Action Agenda*

*for Agricultural Education; Reinventing Agricultural Education for the Year 2020*. The first goal within this strategic plan aimed to provide “an abundance of highly motivated, well-educated teachers in all disciplines, pre-kindergarten through adult, providing agriculture, food, fiber, and natural resources systems (AFNR) education” (National Council for Agricultural Education, 2001, p. 4). Through this initiative, The National Council for Agricultural Education (2001) hoped to provide SBAE teachers representing nationwide diversity, through preparation programs integrating AFNR principles, which rely on current research to help develop innovative curriculum integrating appropriate teaching strategies and technologies. “The responsibility of preparing future effective agriculture teachers to conduct a total agricultural program primarily resides with the teacher educators at universities with agricultural education programs” (Roberts & Dyer, 2004, p. 84). The call for developing well-educated, effective SBAE teachers is clear. However, given the current educational landscape, what specific human capital (i.e., education, skills, training, and experiences) is necessary for equipping SBAE teachers to be effective in their various roles?

### **Theoretical/Conceptual Framework**

The study was undergirded using the human capital theory. The human capital theory assesses the investment a person makes in his or her education, skills, experiences, and training (Becker, 1964; Little, 2003; Shultz, 1971; Smith, 2010; Smylie, 1996) for the purpose of employability (Becker, 1964). Human capital can be general or specific (Smith, 2010), and can lead to employment in various sectors of particular industries (Smith, 2010). Acquiring additional human capital improves a person’s competence for performing his or her trade or vocation (Heckman, 2000). Regarding the position a person has acquired, different human capital is required and valued (Lepak & Snell, 1999). Therefore, it is imperative that when assessing human capital needs, they be applicable and targeted to a specific population within a particular industry or profession (Smith, 2000). Unfortunately, regarding the teaching profession in agricultural education, the literature on the specific human capital needed “. . . is lacking” (Robinson & Baker, 2013, p. 153). What is more, considering the educational climate regarding teacher certification, accessibility, and interest, or lack thereof, assessing the human capital needs of the current teaching core is an imperative task.

### **Purpose of the Study**

The purpose of this study was to identify the characteristics necessary to be an effective SBAE teacher. The characteristics identified in this study will help to inform agricultural teacher educators of the specific education, skills, training, and experiences needed for preparing future SBAE teachers. Two objectives directed the study:

- 1) Determine the characteristics necessary for an effective SBAE teacher, and
- 2) Categorize the characteristics based on needs of a complete SBAE teacher.

### **Methods and Procedures**

This nationwide study employed a modified Delphi approach to elicits the opinions of experts and then identifies consensus among them (Dalkey, 1969), providing descriptive information for the researchers. “In general, the Delphi procedures have three features: (1)

anonymity, (2) controlled feedback, and (3) statistical group response” (Dalkey, Rourke, Lewis, & Snyder, 1972, pp. 20-21). Although the effective characteristics of SBAE teachers are observed often, they are seldomly verbalized (Stewart, 2001). Thus, the Delphi approach is a useful method in uncovering these non-verbalized findings (Stewart, 2001).

The study was based on previous research from Roberts and Dyer (2004) who identified the effective characteristics of agriculture teachers in Florida. Although their study was state-specific, we were interested in conducting a national study to determine the needs of SBAE teachers across the country. To determine the characteristics that equate to effective SBAE teachers, a panel of experts was identified. The panel included 20 middle and high school agricultural education teachers, five state supervisors of agricultural education, eight teacher educators in agricultural education, and two National FFA representatives ( $n = 35$ ). The criterion implemented for selecting the expert panel was based on having won a national professional teaching award for 2017, including the American Association for Agricultural Education (AAAE), National Association of Agricultural Educators (NAAE), and the National Association of Supervisors of Agricultural Education (NASAE), along with a member of the National FFA board of directors. The panel of experts ranged in experience from three years to in excess of 25 and represented 21 states. The identified experts were invited to participate in the study via electronic mail. Regarding Delphi studies, Hsu and Sandford (2007) recommended that, “subjects should be highly trained and competent within the specialized area of knowledge” (p. 3). Because the panelists were award winners in their respective professional societies, they were considered to have expertise in the area of agricultural education.

Dalkey (1969) stated that when a Delphi has greater than 13 respondents, reliability of at least .80 is possible. Therefore, the researchers worked to achieve a limited amount of attrition to maintain the integrity of the panel of experts. The study employed Qualtrics, an online data collection survey instrument, for all three rounds. The instrument was delivered via email to all 35 identified experts. To help increase respondents, web and mobile survey design principles were employed based on the recommendations of Dillman’s, Smyth’s, and Christian’s (2014) Tailored Design Method, i.e., designing the questionnaire formatting for both computer and mobile device compatibility and the usage of three follow-up emails to participants for each round of the study. To ensure instrument validity, faculty at Oklahoma State University reviewed the instrument for face and content validity prior to sending it out each round.

For Round One, the researchers asked one open-ended question, *What are the characteristics of an effective agricultural education teacher?* The goal of Round One, was to identify these key characteristics from the experts to include in Round Two. Round One resulted in 121 statements from 17 experts for a 48.6% response rate. The research team analyzed the Round One data to develop the list of characteristics for Round Two, by condensing statements that were deemed to have the same meaning as another. Of the 121 original statements, 68 were submitted for Round Two. Round Two asked the experts to rate the 68 statements of effective SBAE teachers on a four-point scale of agreement: 1 = Strongly Disagree; 2 = Disagree; 3 = Agree; 4 = Strongly Agree. Characteristics in Round Two achieving a mean rating of 3.0 or higher with 100% agreement were considered as meeting consensus. Round Two produced a 40.0% response rate, with 14 experts participating. Twenty-eight statements reached consensus in Round Two, reaching 100% agreement. The goal of Round Three was to arrive at consensus

on the remaining 40 items. During Round Three, the panel was asked to *agree* or *disagree* with the 40 statements that did not meet consensus in Round Two and explain their rationale. This allowed the “panelists an opportunity to make further clarifications of both the information and their judgments of the relative importance of the items” (Hsu & Sanford, 2007, p. 3). An a priori rate of 85% agreement was set by the researchers for consensus to be met in Round Three. Any statements not reaching 85% agreement from the panel were removed from the final list of characteristics. The procedural rounds continued until consensus was achieved, which in this case, was Round Three, which is an appropriate duration for a *typical* Delphi study to achieve consensus (Custer, Scarcella, & Stewart, 1999). Round Three had 17 panelists participate, resulting in a 48.6% response rate. The study had a small attrition rate between Round One and Round Two but experienced no attrition between Rounds Two and Three.

The final step was to categorize the 68 characteristics identified by the experts. The researchers allowed the categories to emerge from characteristics, resulting in thematic groupings of effective SBAE teaching characteristics. This approach allowed the items to be categorized with similar items, resulting in overarching themes.

## Findings

Round One was designed to compile a comprehensive list of characteristics associated with being an effective SBAE teacher nationwide. One open-ended response question was utilized asking experts, *What are the characteristics of an effective agricultural education teacher?* Round One resulted in 121 statements, from the 17 participants. Responses varied from single words, i.e. “FFA,” “SAE,” “Kind,” “Trustworthy,” to detailed statements, i.e. “Knowledgeable about agriculture and education,” and “An effective ag teacher focuses on the classroom first by providing engaging, relevant, and challenging facilitation of real-world activities toward establishing critical-thinkers.” The 121 responses in Round One were condensed to 68 statements by the research team, as many of the initial statements were direct duplications or redundant in nature and offered the same meaning.

In Round Two, 68 statements were sent to the nationwide panel of experts who rated each item on a four-point scale of agreement. An a priori mean rating of 3.0 or higher, with 100% agreement between the panelists was used to determine consensus on the characteristics. Table 1 provides the outcomes, identifying the mean, standard deviation, and percentage of agreement. Each item is ranked according to mean score. Of the 68 statements, 28 reached consensus of agreement in Round Two, achieving a mean rating of higher than a 3.0 and 100% agreement amongst the panel. The items ranged from “Understands student needs” ( $M = 3.86$ ;  $SD = .36$ ) to “Has the ability to say no” ( $M = 3.29$ ;  $SD = .47$ ). The highest rated item in Round Two with 100% agreement was, “Understands student needs” ( $M = 3.86$ ;  $SD = .36$ ). The lowest rated item with 79% agreement in Round Two was, “Is a leader in the community” ( $M = 3.00$ ;  $SD = .88$ ). Regarding percentage of agreement, the item, “Demonstrates a willingness to put in long hours” received the least amount of support (72%) from the panelists (see Table 1).

Table 1

*Round Two: Level of Agreement with Effective Characteristics of SBAE Teachers (n = 14)*

Identified Characteristic	<i>M</i>	<i>SD</i>	<i>% Agreement<sup>a</sup></i>
Understands student needs.	3.86	.36	100
Is an advocate for all students.	3.79	.43	100
Shows integrity.	3.79	.43	100
Values students regardless of gender.	3.79	.43	100
Is engaging.	3.71	.61	92.9
Is a purposeful lifelong learner.	3.71	.47	100
Leads a balanced life.	3.71	.47	100
Values students regardless of economic status.	3.71	.47	100
Is fair.	3.64	.50	100
Demonstrates classroom management.	3.64	.63	92.9
Is student focused.	3.64	.50	100
Values students from all ethnic/racial groups.	3.64	.50	100
Is trustworthy.	3.64	.50	100
Is honest.	3.64	.50	100
Is passionate about agriculture.	3.57	.65	92.9
Cares about all students.	3.57	.65	92.9
Understands diversity.	3.57	.51	100
Uses the complete agricultural education model as a guide to programmatic decisions and practices.	3.57	.65	92.9
Shows empathy.	3.50	.52	100
Understands experiential education theory.	3.50	.65	92.9
Is motivated for student success.	3.50	.86	92.9
Is passionate about education.	3.50	.52	100
Is respectful.	3.50	.52	100
Provides a variety of learning opportunities to meet the needs of all students.	3.50	.52	100
Guides students to grow personally.	3.50	.52	100
Is knowledgeable about agriculture.	3.43	.65	92.9
Is dependable.	3.43	.51	100
Is a leader for students.	3.43	.51	100
Demonstrates pedagogical knowledge.	3.43	.51	100
Demonstrates adaptability.	3.43	.65	92.9
Is a good communicator.	3.43	.51	100
Instructs students through supervised agricultural experiences.	3.43	.85	92.9
Is a facilitator.	3.36	.63	92.9
Is culturally relevant.	3.36	.50	100
Is responsible.	3.36	.50	100
Is genuine.	3.36	.84	92.9
Is a dedicated professional.	3.36	.75	85.7
Understands there is not an award for all students, but that does not mean they are not valuable.	3.36	.75	85.7
Is relatable.	3.36	.50	100

Is first and foremost a classroom teacher.	3.36	.75	85.7
Demonstrates sound educational practices.	3.36	.50	100
Has agricultural education training.	3.29	.83	78.6
Has with-it-ness.	3.29	.73	85.7
Is creative in the classroom.	3.29	.61	92.9
Advises the FFA chapter.	3.29	.91	85.7
Is innovative.	3.29	.73	85.7
Has patience.	3.29	.61	92.9
Has the ability to say no.	3.29	.47	100
Is not just a facilitator of record keeping for degrees and awards.	3.29	.73	85.8
Is prepared for every class.	3.21	.43	100
Prepares students to be leaders.	3.21	.70	85.7
Is firm.	3.21	.70	85.7
Is engaged in an appropriate professional organization.	3.21	.70	85.7
Instructs students through the FFA.	3.14	.86	85.7
Is passionate about FFA.	3.14	.86	85.7
Is resourceful as an administrator of the program.	3.14	.86	85.7
Uses curriculum to plan for lessons.	3.14	.86	85.7
Is helpful.	3.14	.66	85.7
Is efficient.	3.14	.66	85.7
Is organized.	3.14	.66	85.7
Demonstrates great time management skills.	3.14	.86	85.7
Is kind.	3.14	.86	85.7
Is an advocate for public education.	3.07	.92	92.9
Demonstrates a willingness to put in extra hours.	3.07	.99	71.5
Is never afraid to ask for help.	3.07	.83	85.7
Is a hard worker.	3.07	.92	78.6
Advises the FFA officers.	3.07	.83	85.7
Is a leader in the community.	3.00	.88	78.6

*Note.* 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree; <sup>a</sup> = items marked as either a 3 or a 4.

Based on the responses from Round Two, 40 statements failed to reach 100% consensus amongst the panel; therefore, those items were resubmitted to the panelists for consideration in Round Three where panelists were asked to agree or disagree with the statement. If the panelist disagreed with a statement, he or she was asked to provide rationale as to why. To determine which characteristics would be retained in Round Three, we established an 85% agreement level as our threshold prior to conducting the study. Table 2 identifies the characteristics for which the panelists were asked to agree or disagree. Of those, 30 statements reached consensus of agreement, resulting in 10 characteristics being removed from the final list of effective teaching characteristics of a secondary agricultural educator, including: (1) “Is a facilitator,” (2) “Is firm,” (3) “Uses curriculum to plan for lessons,” (4) “Is efficient,” (5) “Demonstrates great time management skills,” (6) “Is kind,” (7) “Has with-it-ness,” (8) “Is creative in the classroom,” (9) “Is a leader in the community,” and (10) “Has agricultural education training” (see Table 2).

Table 2

*Round Three: Agreement with Effective Characteristics (n = 17)*

Identified Characteristic	<i>Agree</i>	<i>Disagree</i>	<i>% Agreement<sup>a</sup></i>
Is engaging.	17	0	100
Demonstrates classroom management.	17	0	100
Cares about all students.	17	0	100
Is genuine.	17	0	100
Prepares students to be leaders.	17	0	100
Is helpful.	17	0	100
Is passionate about agriculture.	16	1	94.1
Uses the complete agricultural education model as a guide to programmatic decisions and practices.	16	1	94.1
Is motivated for student success.	16	1	94.1
Is knowledgeable about agriculture.	16	1	94.1
Is a dedicated professional.	16	1	94.1
Advises the FFA chapter.	16	1	94.1
Has patience.	16	1	94.1
Is engaged in an appropriate professional organization.	16	1	94.1
Is resourceful as an administrator of the program.	16	1	94.1
Instructs students through the FFA.	16	1	94.1
Is a hard worker.	16	1	94.1
Advises the FFA officers.	16	1	94.1
Understands experiential education theory.	15	2	88.2
Demonstrates adaptability.	15	2	88.2
Instructs students through supervised agricultural experiences.	15	2	88.2
Understands there is not an award for all students, but that does not mean they are not valuable.	15	2	88.2
Is first and foremost a classroom teacher.	15	2	88.2
Is innovative.	15	2	88.2
Is not just a facilitator of record keeping for degrees and awards.	15	2	88.2
Is passionate about FFA.	15	2	88.2
Is organized.	15	2	88.2
Is an advocate for public education.	15	2	88.2
Demonstrates a willingness to put in extra hours.	15	2	88.2
Is never afraid to ask for help.	15	2	88.2
Is a facilitator.	14	3	82.4
Is firm.	14	3	82.4
Uses curriculum to plan for lessons.	14	3	82.4
Is efficient.	14	3	82.4
Demonstrates great time management skills.	14	3	82.4
Is kind.	14	3	82.4

Has with-it-ness.	13	4	76.5
Is creative in the classroom.	13	4	76.5
Is a leader in the community.	13	4	76.5
Has agricultural education training.	12	5	70.6

*Note.* ; <sup>a</sup> = items marked as either a 3 or a 4; a priori of 85% was set by the researchers to retain the characteristics.

Ten characteristics failed to meet consensus in Round Three. Experts stated that nine of the 10 were not “central to the theme,” “less essential than the others,” or made experts ask the question, “Could someone be an effective teacher without this?” to which they were able to answer, *yes*. The statement, “Has agricultural education training” (71%), received the lowest percentage of agreement, with experts explaining that numerous effective agricultural education teachers are alternatively certified and do not have formal agricultural education training.

The second objective sought to categorize the statements of effective SBAE teachers identified by the experts, excluding the characteristics not reaching consensus during the study. Table 3 identifies the eight categories, composed of 58 characteristics meeting consensus for effective agricultural education teachers. The eight categories are instruction, FFA, SAE, Program Planning, Balance, Diversity and Inclusion, Professionalism, and Personal Dispositions. Regarding items within the categories, Personal Dispositions ( $n = 15$ ) and Instruction ( $n = 14$ ) received the most identified characteristics, and SAE received the fewest ( $n = 1$ ). In addition, FFA had six items, Program Planning had two items, Balance had four items, Diversity and Inclusion had nine items, and Professionalism had five items (see Table 3).

Table 3

*Categorized Characteristics of Effective SBAE Teachers*

Category	Identified Characteristic
Instruction	Is passionate about education.
	Provides a variety of learning opportunities to meet the needs of all students.
	Guides students to grow personally.
	Is a leader for students.
	Demonstrates pedagogical knowledge.
	Is a good communicator.
	Demonstrates sound educational practices.
	Is prepared for every class.
	Demonstrates classroom management.
	Understands experiential learning theory.
	Is motivated for student success.
	Is knowledgeable about agriculture.
	Is first and foremost a classroom teacher.
	Is innovative.
FFA	Advises the FFA chapter.

	<p>Is not just a facilitator of record keeping for degrees and awards.          Instructs students through FFA.          Is passionate about FFA.          Advises the FFA officers.          Prepares students to be leaders.</p>
SAE	Instructs students through supervised agricultural experiences.
Program Planning	<p>Uses the complete agricultural education model as a guide to programmatic decisions and practices.          Is resourceful as an administrator of the program.</p>
Balance	<p>Leads a balanced life.          Has the ability to say no.          Is never afraid to ask for help.          Demonstrates a willingness to put in extra hours.</p>
Diversity and Inclusion	<p>Understands student needs.          Is an advocate for all students.          Values students regardless of gender.          Values students regardless of economic status.          Values students from all ethnic/racial groups.          Understands diversity.          Is culturally relevant.          Cares about all students.          Understands there is not an award for all students, but that does not mean they are not valuable.</p>
Professionalism	<p>Is a purposeful lifelong learner.          Demonstrates adaptability.          Is a dedicated professional.          Is an advocate for public education.          Is engaged in an appropriate professional organization.</p>
Personal Dispositions	<p>Is fair.          Is student focused.          Is trustworthy.          Is honest.          Is passionate about agriculture.          Is respectful.          Shows empathy.          Is dependable.          Is responsible.          Is relatable.          Is genuine.          Is a hard worker.</p>

---

Is organized.  
Is helpful.  
Has patience.

---

## Conclusions

The study aimed to determine the characteristics necessary for becoming an effective SBAE teacher, as identified by a nationwide panel of experts. A three-round Delphi approach was used to conduct the study and collect the data. Round One resulted in 121 identified characteristics, aligning with the three-component model of agricultural education (National FFA, 2018), effective characteristics of teachers (Darling-Hammond, 2002; Rosenshine & Furst, 1971; Steele, 2010), and various other personal qualities or attributes that experts noted were important for a SBAE teacher to possess. After conducting Rounds Two and Three, 58 characteristics achieved consensus of agreement at 85% or higher, a level we established prior to beginning the study. The second objective was to configure the identified characteristics into relevant categories. Of the 58 characteristics, eight categories emerged to centralize the themes of the statements, including Instruction, FFA, SAE, Program Planning, Balance, Diversity and Inclusion, Professionalism, and Personal Dispositions. Roberts and Dyer (2004) also identified eight categories of effective SBAE teachers in their study, of which six align with our findings.

Effective agricultural education teachers need to possess certain personal qualities, as this study identified 15 characteristics that experts deemed vital, aligning with findings discussing the importance of these qualities from Luft and Thompson (1995) and Roberts and Dyer (2004). Although numerous characteristics reached consensus, 10 did not meet the set level of agreement, including characteristics related to personal qualities, community leadership, and creativity in the classroom. In addition, the item, “Has agricultural education training” had the least amount of agreement in Round Three at 71%. Based on these findings, it seems as though the panelists are calling for re-envisioning the workload and job description of SBAE teachers from the status quo. Having a balanced program and personal life, refraining from working extra hours, and limiting one’s involvement in the community as a leader are *calls to action* for teacher education programs that prepare future teachers. Although these findings potentially can offset teacher burnout and stress and lead to longevity and retention in the profession, what do they mean per the National FFA’s call for local program of success (LPS)? There is little doubt that the pressing need for school administrators to fill vacant positions, along with a decreasing supply of traditionally certified agricultural education teachers nationwide (Smith et al., 2018), has caused various positions to be filled by alternatively or emergency certified teachers. Perhaps this influx of non-traditional routes to teacher certification has created an opportunity to re-envision the role of SBAE teachers going forward.

Instruction and Personal Dispositions resulted in the greatest number of characteristics associated with each, leading to the importance of not only personal qualities for potential SBAE teacher candidates, but also the importance of classroom instruction, aligning with nationwide accreditation standards (CCSSO, 2013; CAEP, 2016). The concept of Diversity and Inclusion within education and more importantly a complete SBAE program came to light with nine

statements reaching consensus. This finding aligns with Elliott (2018) who advocated the importance of being inclusive within SBAE programs.

### **Recommendations**

Numerous questions for further investigation for both research and practice exist. Regarding recommendations for research, future studies should assess which characteristics are teachable and which need to be identified prior to entering a teacher preparation program. The onus for acquiring the human capital necessary to be an effective SBAE teacher should be placed directly on the student. However, it should be the role of teacher preparation programs to establish assignments and experiences with benchmarks that assist pre-service teachers in acquiring said human capital. Identifying effective teachers who meet these criteria and have acquired the human capital (i.e., education, skills, training, and experiences) necessary should be established. Specifically, we recommend that each state certifying institution should use the findings of this study as criteria to identify a cohort of teachers who align with the eight categories revealed in this study, which indicate an effective SBAE teacher. Once identified, teacher preparation programs should highlight and use these individuals as models for their pre-service teachers as often as possible. Examples could consist of allowing their pre-service teachers to observe and shadow these mentors in their early field based experiences, having the mentors come to campus and share insight into the profession as guest lecturers, and using these mentors as cooperating teachers during pre-service teachers' student teaching internships. These individuals also should be used to host professional development workshops for inservice teachers explaining how they developed their specific human capital to meet the eight criteria established in this study.

The Personal Dispositions category included the highest frequency of items from the panelists indicating it is a popular and important category. However, can qualities and ethics such as being fair, trustworthy, and honest be taught in higher education, or are these attributes that students need to have exhibited prior to their decision to enter a teaching-related major? Teacher educators should consider ways in which pre-service teachers are exposed and allowed to learn these attributes. Case studies, personal stories, and examples should be shared frequently regarding the Personal Distribution category. In addition, an instrument should be developed to measure pre-service students' growth in this area. In fact, research should assess pre-service teachers' growth in each of the eight areas over the duration of their academic career. Specifically, the instrument should assess students each year of their academic major beginning in their freshman year and ending at the conclusion of their student teaching internship.

### **Discussion**

Numerous states continue to experience teacher shortages. Teacher burnout, stress, and dissatisfaction continue to be assessed across the profession. In addition, higher rates of teachers are being employed from non-traditional routes. With the educational landscape changing everyday, perhaps it is time to reconsider the job expectations of a SBAE teacher. The findings of this study seem to support this notion. Understanding these characteristics from a nationwide perspective allows teacher preparation programs to identify the needs of their students based on characteristics of effective teachers. If teacher education is going to thrive in the future,

determining what constitutes a quality program and teacher must be considered, acknowledged, emphasized, and rewarded.

## References

- Becker, G. (1964). *Human capital: A theoretical and empirical analysis with special reference to education*. Chicago, IL: The University of Chicago Press.
- Bowling, A. M., & Ball, A. L. (2018). Alternative certification: A solution or an alternative problem? *Journal of Agricultural Education*, *59*(2), 109–122. doi:10.5032/jae.2018.02109
- Boyd, D., Grossman, P., Hammerness, K., Lankford, H., Loeb, S., Ronfeldt, M., & Wyckoff, J. (2012). Recruiting effective math teachers: Evidence from New York city. *American Educational Research Journal*, *49*(6), 1008-1047. doi:10.3102/0002831211434579
- Council for the Accreditation of Educator Preparation (CAEP) (2016). *2013 CAEP standards*. Retrieved from <http://www.caepnet.org/~media/Files/caep/standards/caep-standards-one-pager-061716.pdf?la=en>
- Council of Chief State School Officers (CCSSO) (2013). *InTASC: Model core teaching standards and learning progressions for teachers 1.0*. Retrieved from [https://ccsso.org/sites/default/files/201712/2013\\_INTASC\\_Learning\\_Progressions\\_for\\_Teachers.pdf](https://ccsso.org/sites/default/files/201712/2013_INTASC_Learning_Progressions_for_Teachers.pdf)
- 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. Retrieved from <http://scholar.lib.vt.edu/ejournals/JVTE/v15n2/custer.html>
- Dalkey, N. C. (1969). *The Delphi method: An experimental study of group opinion*. Santa Monica, CA: The Rand Corporation.
- Dalkey, N. C., Rourke, D. L., Lewis, R., & Snyder, D. (1972). *Studies in the quality of life: Delphi and decision-making* Lexington, MA: Lexington Books.
- Darling-Hammond, L. (2002). Educating a profession for equitable practice. In L. Darling-Hammond, J. French, & S. P. Garcia-Lopez (Eds.), *Learning to teach for social justice* (pp. 201-212). New York, NY: Teachers College Press.
- Davis, R. J., & Jayaratne, K. S. U. (2015). In-service training needs of agriculture teachers for preparing them to be effective in the 21st century. *Journal of Agricultural Education*, *56*(4), 47-58. doi:10.5032/jae.2015.04047
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method*. Hoboken, NJ: Wiley.

- Elliott, K. M. (2018). Inclusivity for all students in ag education: It's personal. *The Agricultural Education Magazine*, 90(6), 7-8. Retrieved from [https://www.naae.org/profdevelopment/magazine/current\\_issue/index.cfm](https://www.naae.org/profdevelopment/magazine/current_issue/index.cfm)
- Farrell, T. S. C. (2015). It's not who you are! It's how you teach! Critical competencies associated with effective teaching. *RELC Journal*, 46(1), 79-88. doi:10.1177/0033688214568096
- Harper, J. G., Weiser, R. G., & Armstrong, R. F. (1990). Factors associated with western region agriculture teachers' perceptions of teaching effectiveness. *Journal of Agricultural Education*, 31(4), 22-26. doi:10.5032/jae.1990.04022
- Heckman, J. L. (2000). *Invest in the very young*. Chicago, IL: Ounce of Prevention Fund. Retrieved from: <http://www.ounceofprevention.org/downloads/publications/Heckman.pdf>
- Hsu, C. C., & Sanford, B. A. (2007). The Delphi technique: Making sense of consensus. *Practical Assessment, Research & Evaluation*, 12(10). Retrieved from <https://pareonline.net/getvn.asp?v=12&n=10>
- Kantrovich, A. J. (2010). *A national study of the supply and demand for teachers of agricultural education from 2006–2009*. Retrieved from <https://www.naae.org/teachag/supplyanddemand.cfm#sd>
- Lambert, M. D., Ball, A. L., & Tummons, J. D. (2011). How do early career agriculture teachers talk about their time?. *Journal of Agricultural Education*, 52(3), 50-63. doi:10.5032/jae.2011.03050
- Lepak, D. P., & Snell, S. A. (1999). The human resource architecture: Toward a theory of human capital allocation and development. *The Academy of Management Review*, 24(1), 31–48.
- Little, A. W. (2003, December). Motivating learning and the development of human capital. *British Association for International and Comparative Education*, 33(4), 437–452.
- Luft, V. D., & Thompson, G. W. (1995). Factoring contributing to the effectiveness of agricultural education teachers: What students say. *The Agricultural Education Magazine*, 68(3), 23-24. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume68/v68i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume68/v68i3.pdf)
- McNeil, J. D., & Popham, W. J. (1973). The assessment of teacher competence. In R. M. W. Travers (Ed.), *Second handbook of research in teaching*. Chicago, IL: Rand McNally.
- National Council for Agricultural Education (2001). *The national strategic plan and action agenda for agricultural education: Reinventing agricultural education for the year 2020*. Retrieved from <https://www.ffa.org/SiteCollectionDocuments/plan2020.pdf>
- National Council for Agricultural Education (2012). *About agricultural education*. Retrieved from <https://www.ffa.org/thecouncil/aboutus>

- National FFA (2018). *Agricultural Education*. Retrieved from <https://www.ffa.org/about/agricultural-education>
- National FFA Organization. (2017). *FFA statistics*. Author. Retrieved from <https://www.ffa.org/about/what-is-ffa/statistics>
- Roberts, T. G., & Dyer, J. E. (2004). Characteristics of effective agriculture teachers. *Journal of Agricultural Education, 45*(4), 82-95. doi:10.5032/jae.2004.04082
- Robinson, J. S. (2010). A qualitative analysis of alternatively certified agricultural education teachers on their first year of employment in the teaching profession. *Journal of Southern Agricultural Education Research, 60*(2), 25–39. Retrieved from <http://www.jsaer.org/pdf/Vol60/2010-60-003.pdf>
- Robinson, J. S., & Baker, M. A. (2013). The effect of human capital on principals' decisions to interview candidates in agricultural education: Implications for pre-service teachers. *Journal of Agricultural Education, 54*(1), 139–152. doi:10.5032/jae.2013.01139
- Robinson, J. S., & Edwards, M. C. (2012). Assessing the teacher self-efficacy of agriculture instructors and their early career employment status: A comparison of certification types. *Journal of Agricultural Education, 53*(1), 150–161. doi:10.5032/jae.2012.01150
- Rockoff, J. E. (2004). The impact of individual teachers on student achievement: Evidence from panel data. *American Economic Review, 94*(2), 247-252. doi:10.1257/0002828041302244
- Rosenshine, B., & Furst, N. (1971). Research on teacher performance criteria. In B. O. Smith (ed.), *Research in Teacher Education – A Symposium* (pp. 37-72). Englewood Cliffs, NJ: Prentice Hall.
- Shultz, T. W. (1971). *Investment in human capital: The role of education and of research*. New York, NY: The Free Press.
- Smith, A. R., Lawver, R. G., & Foster, D. D. (2018). National Agricultural Education Supply and Demand Study, 2017 Executive Summary. Retrieved from <http://aaaonline.org/Teacher-Supply-and-Demand>
- Smith, E. (2010). Sector-specific human capital and the distribution of earnings. *Journal of Human Capital, 4*(1), 35–61.
- Smylie, M. A. (1996). From bureaucratic control to building human capital: The importance of teaching learning in education reform. *Educational Researcher, 25*(9), 9–11.
- Steele, N. A. (2010). Three characteristics of effective teachers. *MENC: The National Association for Music Education, 27*(2), 71-78. doi:10.1177/8755123310361769
- Stewart, J. (2001). Is the Delphi technique a qualitative method? *Medical Education, 35*, 922-923. doi:10.1111/13652923200101045

Torres, R. M., Ulmer, J. D., & Aschenbrener, M. S. (2008). Workload distribution among agriculture teachers. *Journal of Agricultural Education*, 49(2), 75-87.  
doi:10.5032/jae.2008.02075

United States Department of Education (n.d.). *No Child Left Behind – Public Law 107-110*. Retrieved from <https://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf>

## Discussant Remarks

### Identifying the Characteristics Necessary for Becoming an Effective Agricultural Education Teacher: A National Study

Discussant: Brian E. Myers, Professor and Chair, University of Florida

Preparing and supporting new and current teachers of agriculture is central to the mission of all teacher educators. This study addresses that need head-on in working to identify the characteristics of effective agricultural education teachers. The method used and the process followed are solid and well explained.

Below I've provided a few a questions/thoughts for you to consider.

1. One thing that struck me as I reviewed the list of characteristics provided by the expert panel was that some of the items were things a teacher does (ex. "Advises the FFA officers") and some may be described as who the teacher is (ex. "Is kind"). The authors allude to this in your discussion on the items as well. It appears to me that several of the items require a subjective judgement to evaluate. What recommendations do you have as teacher educators use this research in making these subjective evaluations?
2. The panel in this study included members of the agricultural education profession. How do you think other groups (students, parents, and administrators) might respond to being asked to develop their own list of the characteristics of an effective agriculture teacher? How should input from these other groups be used to instruct the development of future and current agriculture teachers?
3. What is the reaction of the authors to the items that were removed from the list? Any surprises or concerns? One (of the many) that is *intriguing* to me is the item "uses curriculum to plan for lessons." I guess one's response to this item could be influenced by how one defines "curriculum" or "plan."
4. In presenting this question to the panel, was there any instruction or guidance on the term "effective agricultural education teacher"? What a respondent sees as the purpose of SBAE and the agriculture teacher could most certainly influence how one responds to this question. Did you see any trends in respondents that might indicate an individual's or a group's philosophical bent toward the purpose of SBAE?
5. In the recommendations section, you provide some guidance to teacher educators on how to use the findings of this study. Could you provide some more detailed examples on how teacher educators could explicitly and intentionally incorporate the characteristics identified?

## Teaching Students with Special Needs in School-Based, Agricultural Education: A Historical Inquiry

Kathryn L. Teixeira, Oklahoma State University  
M. Craig Edwards, Oklahoma State University

### Abstract

*The purpose of this historical study was to investigate the inclusion of students with special needs in school-based, agricultural education as reported by The Agricultural Education Magazine and the Journal of Agricultural Education over a time period of six decades. The impact of landmark legislation, such as the Vocational Education Act of 1963, the Elementary and Secondary Education Act of 1965, the Education for All Handicapped Children Act of 1975, and the Individuals with Disabilities Act of 1990, were examined. This legislation motivated and supported agricultural education's efforts to meet the learning needs of special education students by providing modified lessons and learning environments, inclusive SAEs and FFA activities, and focused teacher preparation. Challenges and concerns regarding the placement of special needs students in school-based, agricultural education are also discussed, as well as opportunities for related research in the future, especially about their participation in the FFA.*

### Introduction

A young man walked the show barns of his county fair wearing his blue corduroy FFA jacket. He spent the last three months raising a Boer meat goat, maintaining the feed and water, and, with his father, built a shelter for the animal some called a *goat mansion*. A child diagnosed with Asperger's Syndrome, he spent the last 10 years of his life in general education classrooms learning from *normal* teachers, interacting with *normal* children, and just being *normal*. He was born in a time when it was not uncommon for students with special needs to be placed in *normal classroom settings*. However, 90 years ago when the National FFA Organization was founded, he might not have been enrolled in public school and much less become a member of the FFA.

Agricultural education began to receive regular federal funding in 1917 with enactment of the Smith-Hughes Act, also known as the National Vocational Education Act (Smith-Hughes Act of 1917 § Pub. L. No. 64-347 § 10). In 1928, 11 years later, 33 farm boys came together from 18 states to form what is known today as the National FFA Organization (2018a). Through the *Official FFA Manual* and other resources, FFA members learn about an organization that has seen students from every walk of life achieve “premier leadership, personal growth, and career success through agricultural education” (National FFA Organization, 2018b, p. 8).

Today, school-based, agricultural education (SBAE) provides opportunities for students to learn through classroom and laboratory instruction, supervised agricultural experiences (SAEs), and FFA activities (Cano & Moore, 2010). Students are able to wear the blue corduroy jacket regardless of race, religion, or gender, but that was not always the *norm*, i.e., “. . . the established behavior patterns for the members of a social system” (Rogers, 2003, p. 26), or, in this case, U.S. public schools. The National FFA Organization, once considered strictly for farmers and rural students, has transitioned to become more inclusive by promoting diversity across cultures and learning abilities (Faulkner & Baggett, 2010). During its history, SBAE and

the National FFA Organization faced large social movements fomenting pivotal moments of cultural change. In 1935, the New Farmers of America (NFA) was founded to create an organization for African American students (Wakefield & Talbert, 2003) at a time when school segregation based on race existed throughout most of the United States. The NFA merged with, or rather was subsumed by, FFA in 1965 (Wakefield & Talbert, 2003). Coinciding with the women's liberation movement of the 1960s, females were officially permitted to join the organization in 1969, and the organization elected its first female president in 1983 (National FFA Organization, 2018b; Wakefield & Talbert, 2003). And, in 2017, it chose an African American female for that office, a milestone in its storied history (National FFA Organization, 2018a). These changes to the organization's norms were prefaced by historical events in U.S. education and society. Rogers (2003) explained that new ideas and innovations are introduced because of "[s]ocial changes and the social problems facing the world" (p. xix). He also stated that changes "require a lengthy period of many years from the time when they become available to the time when they are widely adopted" (p. 1). Along with the sweeping social changes of the 20th century that impacted SBAE, including the FFA component, key legislative and historical events also sped the inclusion of students with special needs into its programming.

### **Purpose and Research Questions**

"All students, including those with learning disabilities, are entitled to the best instruction that agricultural education teachers can provide" (Faulkner & Baggett, 2010, p. 94). The primary purpose of this historical study was to describe forces presaging the inclusion of students with special needs in SBAE, and how such was achieved over time, as reported in *The Agricultural Education Magazine* and in the *Journal of Agricultural Education*. This study also examined how agricultural education teachers have served the learning needs of students with special needs. Two questions guided the study: (1) What major federal legislation addressed the educational needs of students with special needs in U.S. public schools? and (2) How did SBAE respond over time to the need to educate students with special needs? Historical research methods were used to achieve the study's purpose and answer its questions (McDowell, 2002).

### **Methodology**

"The purpose of historical research is to make sense of a series of events in a specified timeframe, establish their authenticity, understand the connection between them and interpret their wider significance" (McDowell, 2002, p. 26). This research process includes identifying an area of study, forming guiding questions, collecting, organizing, verifying, validating, analyzing and selecting data, answering the questions, and compiling the research report (Cohen & Manion, 1994). Historical research demands a "systematic gathering and criticism of documents, records, and artifacts to provide a description and interpretation of past events or persons" (McMillan, 2012, p. 15). Moreover, "[t]he historical study of an educational idea or institution can do much to help us understand how our present educational system has come about" (Cohen & Manion, 1994, p. 46). Using Internet search engines and the Oklahoma State University library's search tools, primary and secondary sources, including peer-refereed journal articles, books, government reports, and articles from *The Agricultural Education Magazine*, were reviewed to provide the study's data. The data were collected thematically, then chronologically analyzed and compared (McDowell, 2002). The key search terms included: handicapped, mental retardation, special education in agricultural education, special education in vocational education, special education laws, and students with special needs. Sources were subjected to

both internal and external criticism to determine accuracy and authenticity, respectively, and triangulation of the findings further supported the study’s credibility (McDowell, 2002).

### Findings

#### Research Question 1: What major federal legislation addressed the educational needs of students with special needs in U.S. public schools?

The differential treatment of individuals with disabilities can be traced back to ancient times when the Romans kept people with disabilities as jesters for royalty (Karten, 2008). Centuries later, at a time when Nazi Germany euthanized individuals with disabilities, the U.S. workforce saw a flood of adults with disabilities join it to fill vacancies left by those who went off to fight Germany during World War II (Karten, 2008). Evidence supporting the inclusion of students with special needs began to accumulate after the wartime workforce integration of such individuals (Karten, 2008). The civil rights movement of the 1950s and 1960s also inspired the parents of children with disabilities to advocate for *appropriate educational opportunities* that matched their children’s unique challenges (Karten, 2008; Katsiyannis, Yell, & Bradley, 2001). This need to provide appropriate learning opportunities for students with disabilities is what led the U.S. Congress to pass the Education for All Handicapped Children Act (EAHCA) in 1975 (Karten, 2008; Katsiyannis et al., 2001; U.S. Department of Education [USDOE], 2010). EAHCA was the watershed moment of the movement to include all students in a *free and appropriate education*, but earlier federal legislation (see Table 1) had also supported improved programs and services for individuals with special learning needs (USDOE, 2010).

Table 1

#### Select Federal Legislation Mandating Aspects of Special Education Prior to 1975

Federal Legislation	Description of Legislation
Captioned Files Acts of 1958 (P.L. 85-905)	Supported the production and distribution of accessible films for individuals who were deaf or hard of hearing (USDOE, 2010)
Training of Professional Personnel Act of 1959 (P.L. 86-158)	Helped train program administrators and teachers of children with mental retardation (USDOE, 2010)
Teachers of the Deaf Act of 1961 (P.L. 87-276)	Trained instructional personnel for children who were deaf or hard of hearing (USDOE, 2010)
Elementary and Secondary Education Act <sup>a</sup> (ESEA; P.L. 89-10)	Provided states with direct grant money to assist with educational purposes; the act included the 1966 amendment creating the Bureau of Education for the Handicapped in the Department of

Health, Education, and Welfare that later became the Office of Special Education Programs (Katsiyannis et al., 2001)

Vocational Education Act of 1963 <sup>b</sup> (P.L. 88-210)	Required specific programs for students with special needs, i.e., academic, socio-economic, or other handicaps (Faulkner, 1968)
State Schools Act <sup>c</sup> (P.L. 89-313)	Extended the benefits of ESEA to children in state programs (USDOE, 2010)
Education of the Handicapped Act (EHA) of 1970 (P.L. 91-230)	Further extended federal grant programs of ESEA and included grants to institutions for teacher training to include teachers of students with disabilities; act was the basis for Public Law 94-142 (Katsiyannis et al., 2001)

---

*Note.* <sup>a</sup>Elementary and Secondary Education Act enacted in 1965. <sup>b</sup>SBAE, known then as vocational agriculture education, was affected by this act. <sup>c</sup>State Schools Act enacted in 1965.

The federal government provided support for training special education teachers and related specialists, and reached more than 30,000 special education professionals by 1968 (Katsiyannis et al., 2001). However, even with the specialized training for special education teachers prior to 1975, more than three million students with disabilities enrolled in schools were not receiving an education deemed appropriate to their needs, and more than 1.75 million students with disabilities did not receive *any* education services during that time (Katsiyannis et al., 2001). As of 1970, “U.S. schools educated only one in five children with disabilities, and many states had laws excluding certain students from school, including children who were deaf, blind, emotionally disturbed, or mentally retarded” (USDOE, 2010, p. 3). In addition, nearly 200,000 persons with significant disabilities were housed within restrictive state institutions and “received care for basic needs rather than education and rehabilitation” (USDOE, 2010, p. 3).

As a way to address the need for significant educational reform regarding students with disabilities, the EAHCA was created by Congress as an amendment to the 1970 Education of the Handicapped Act (EHA). Congress proposed the amendment “to ensure that each student with a disability received an education suited to his or her unique needs” (Katsiyannis et al., 2001, p. 326). EAHCA, also referred to as Public Law 94-142, guaranteed a free appropriate public education to each child with a disability and provided states and local education agencies, i.e., school systems or school districts, with financial incentives to comply with the law (USDOE, 2010). The primary purposes of Public Law 94-142 included:

to assure that all children with disabilities have available to them . . . a free appropriate public education which emphasizes special education and related services designed to meet their unique needs, [b] to assure that the rights of children with disabilities and their parents . . . are protected, [c] to assist States and localities to provide for the education of

all children with disabilities, and [d] to assess and assure the effectiveness of efforts to educate all children with disabilities. (USDOE, 2010, p. 5)

After 1975, classrooms became more inclusive of students with special needs, and “the futures of children with disabilities [were] brighter” (USDOE, 2010, p. 11). As a testament, in 2010, 57% of students with disabilities were learning in general education classrooms for at least 80% of the school day (USDOE, 2010), i.e., the concept of *mainstreaming* was at work. Hudson, Graham, and Warner (1979) explained that students “labeled as handicapped must receive their education within the *mainstream* [emphasis added] of the regular school environment” (p. 58). Moreover, in 2011, Blanton, Pugach, and Florian reported the number of students spending 80% of the school day in general education had increased compared to the previous decade. The EAHCA has been amended numerous times since its passage in 1975 to expand the rights of students with disabilities, including a change to the name of the law: The Individuals with Disabilities Education Act (IDEA) of 1990 (Katsiyannis et al., 2001). Table 2 shows the major amendments made after EAHCA was passed by Congress in 1975. The IDEA Amendments of 1997 established “the right of students with disabilities to a free appropriate public education, including special education, related services, and transition services” (Wonacott, 2001, p. 2). An Individualized Education Program (IEP), as mandated by IDEA, provided direction for a student’s educational goals by identifying “the student's current level of educational performance; measurable goals and objectives; special education, related services, and other accommodations to be provided; and the extent of participation with nondisabled students” (Wonacott, 2001, p. 2). In addition, an IEP specifies modifications to be made for the student, and how educational progress will be measured and shared with parents (Wonacott, 2001).

Table 2

*Major Amendments to the EAHCA<sup>a</sup>*

---

The Individuals with Disabilities Education Act of 1990; P.L. 101-476	<ul style="list-style-type: none"> <li>- Changed the name of the law from the EAHCA<sup>a</sup> to the IDEA<sup>b</sup></li> <li>- Added autism and traumatic brain injury as categories of disabilities</li> </ul>
The Individuals with Disabilities Education Act Amendments of 1997; P.L. 105-17	<ul style="list-style-type: none"> <li>- Strengthened the role of parents</li> <li>- Emphasized student progress toward meaningful educational goals</li> <li>- Encouraged resolution of differences by using non-adversarial mediation</li> <li>- Made changes to the IEP team and document</li> <li>- Added disciplinary provisions to the IDEA</li> </ul>

---

*Note.* Table was adapted from Katsiyannis et al. (2001); <sup>a</sup>Education for All Handicapped Children Act of 1975; <sup>b</sup>Individuals with Disabilities Education Act

Eisenman (2000) suggested all students, including those with disabilities, should participate in programs that infuse academic curriculum with career-related learning experiences. Students involved in career and technical education (CTE), including SBAE, have higher academic achievement, and increased postsecondary engagement (Eisenman, 2000). Under the IDEA of 1990, CTE programs must provide a free appropriate education to students identified as having disabilities and in need of special education and related services, i.e., physical and occupational therapy, counseling, transportation, and so forth, to optimize their opportunities to benefit from the programs in which they may enroll (Dieterich & Smith, 2015). In 2008, Congress reauthorized the Higher Education Opportunity Act, adding more provisions for the preparation of general education teachers to instruct students with special needs (Blanton et al., 2011). This reauthorization mandated states receiving funding to report the “extent to which teacher preparation programs prepare teachers” to serve this population (Higher Education Opportunity Act, 2008a, p. 3135). In addition, the act required higher education institutions who prepared teachers to provide assurance of training for mainstream teachers regarding the “instruction to diverse populations, including children with disabilities . . .” (Higher Education Opportunity Act, 2008b, p. 3152). Although inclusion of special needs students is mandated by law, teacher preparation for the instruction of these students in the United States is only *influenced* by federal policies and programs, i.e., no comprehensive mandate or nationwide policy related to teacher preparation exists (Blanton et al., 2011). Individual states, however, have increased standards for teacher licensing which influences their teacher preparation standards, and systematically includes individualized learning for special needs students (Darling-Hammond, 2005). As part of traditional teacher preparation in some states, programs for agricultural educators include special education in their curricula to better prepare future teachers to include students with special needs in SBAE (Giffing, Warnick, Tarpley, & Williams, 2010).

### **Research Question 2: How did SBAE respond over time to the need to educate students with special needs?**

With the mandates put in place by the enactment of federal legislation (see Tables 1 & 2), students with special needs have been accommodated for in U.S. Public Schools, including in SBAE programs. SBAE teachers are legally responsible to accommodate their programs for students with special needs (Daniels & Walker, 1975; Filson & Whittington, 2011). It might seem as though this has always been the case, but IDEA “shifted the focus of vocational education to serving special populations” (Moore, 2004, p. 5). Moreover, “[t]he unique strengths of agricultural education are what make it a successful learning strategy for regular and exceptional students alike” (Osborne, 1993, p. 3). CTE, including SBAE, emphasizes a hands-on approach in its instruction, and has provided opportunities for special needs students to flourish (Gaona, 2004). In his 1975 article in *The Agricultural Education Magazine*, Walls stated: “Teaching the disadvantaged and handicapped may well be one of the greatest satisfactions a teacher can receive during [their] teaching career, especially if [they have] a genuine interest in helping those less fortunate” (p. 263). However, Toole and Eddowes (1985) may have best described the capacity of SBAE: “With its emphasis on learning by doing, its use of scientific innovation and technology and its appreciation of the needs and interests of individual students, vocational agriculture seems uniquely suited to help handicapped students succeed” (p. 13).

**Vocational Education for Special Needs Students through SBAE.** Before implementation of the EACHA in 1975, the Vocational Education Act of 1963 was the basis for

requiring that SBAE be made available to students with special needs (Walls, 1975). The act “charged vocational education with the responsibility of providing special programs for persons who have academic, socio-economic, or other handicaps that prevent them from succeeding in the regular vocational education programs” (Faulkner, 1968, p. 57). The law broadened the scope of students to be served (Hamlin, 1965) and required states devote 25% of their federal funding to provide educational opportunities for handicapped and disadvantaged students (Walls, 1975).

J. B. Hamilton (1968) asserted that “[s]erving the educational needs of rural youth with special needs is a problem of considerable magnitude” (p. 74). However, without a clear federal definition of *students with special needs*, state funding agencies forced the issue of “identifying handicapped and disadvantaged students in a consistent and accurate manner” (O’Reilly, 1975, p. 36). The Vocational Education Act of 1963 encouraged educational programs at the state and local levels to develop plans to meet the needs of special groups, but no clear definition existed regarding which individuals made up *specific special groups* (O’Reilly, 1975). It was during the 1960s that SBAE professionals began addressing concerns and practices for students with special needs in *The Agricultural Education Magazine*. The publications included a number of themed issues that addressed the topic over about five decades (see Table 3). Even though SBAE had always emphasized hands-on learning, which tended to benefit many students with disabilities, the programs were not specifically designed to address their unique learning requirements (Walls, 1975), and the profession needed guidance.

Table 3

*Special Needs-Themed Issues of The Agricultural Education Magazine following Enactment of Vocational Education Act of 1963*

Issue Date	Theme Title	Articles <sup>a</sup>	Authors <sup>b</sup>
September 1968	Agricultural Education for Persons with Special Needs	8	10
April 1971	Agricultural Education for the Disadvantaged	12	14
May 1975	Teaching the Disadvantaged and Handicapped	8	10
November 1980	Programs for Exceptional Students	9	11
February 1985	Vocational Agriculture and the Handicapped Student	6	9
March 1993	Serving Individuals with Disabilities	7	12
December 1993	Teaching Academically Disadvantaged Students	5	6
May/June 2012	Serving Students in Agricultural Education with Special Needs	8	15
		Total	63
			87

---

Note. <sup>a</sup>Number of articles in issue related to students with special needs. <sup>b</sup>Number of unduplicated authors of special education-themed articles by issue.

September 1968 was the first of several issues of *The Agricultural Education Magazine* that would highlight the inclusion of students with special needs in SBAE (see Table 3). In this third issue of 1968, Editor J. Robert Warmbrod stated: “Agricultural educators in general, and high school teachers specifically, can rightfully be proud of the emphasis given to the individual needs, characteristics, and interests of students in planning and conducting instructional programs in agriculture” (p. 55). Multiple articles in the issue elaborated on Warmbrod’s position. For example, Harlan and Grimes (1968) explained how the *Coordinated Shop Program* within their department at Rogers High School in Arkansas provided opportunities for “students who are mentally and academically slow to participate with students of their own peer group” (p. 58). In recognition of the language used at that time, the pupils identified as *students with special needs* in this issue of the magazine were described as slow learners, poor performing students, pupils with poor educational backgrounds, and potential dropouts (Faulkner, 1968; Walker, 1968). Students with any “emotional and psychological problems which are not serious enough to require constant attention or institutionalization” (Faulkner, 1968, p. 57) were referred to as *students with special needs*. The article “Identifying the Educationally Handicapped” described such students as having “an obvious lack in the basic skills” (Hamilton, D. A., 1968, p. 66).

D. A. Hamilton (1968) explained: “Students who upon investigation or observation portray evidence of being educationally handicapped cannot be expected to survive educationally, nor to become viable components of the society of which they are a segment unless special help is given to them” (p. 66). He said further: “The student who does not achieve is labeled as ‘slow’ or of ‘low intelligence.’ . . . intelligence is not only the determining factor. Students of average, above average, or below average intelligence may be educationally handicapped” (p. 66). This initial outreach by the magazine to teachers of agriculture regarding their serving students with special needs also included programs for the mentally retarded (Hamilton, D. A., 1968). For instance, Edward Ortiz’s (1968) article spotlighted a New York agricultural education program working with mentally retarded students focusing on greenhouse and nursery production. In addition, J. B. Hamilton (1968) recognized that many youths with special needs often lacked communication and social skills, i.e., learning outcomes for which vocational agriculture education, and its FFA component in particular, had been designed to help students achieve. J. B. Hamilton (1968) pushed for reform and said: “[Teachers] must be prepared and willing to work with the less able student and with the socio-economically deprived” (p.75).

The 1968 Amendment to the Vocational Education Act of 1963 solidified the need for students to remain in regular education programs, as long as they could benefit from the instruction (Lee, 1971). The 1971 issue of *The Agricultural Education Magazine* highlighted many programs set to include and help students with special needs. Dawson (1971) stated that, although past generations pushed aside and isolated disadvantaged members of society, “to neglect educating and training the disadvantaged portion of our society is a waste of human resource[s] which is detrimental to the welfare of our nation” (p. 242). Moreover, Lee (1971) emphasized the importance of including students with disabilities in regular education classes to prevent isolation from their non-disabled peers and to prevent them being labeled as inferior students. The Education Amendment of 1976 defined the scope and different conditions of

students with special needs, and it placed a portion of federal vocational funding aside for special needs populations (Scanlon & Baggett, 1985). However, even with this federal funding, and later the Carl D. Perkins Act of 1984, which called for an allocation of funds to be spent on special populations (Moore, 2004), it was still questioned whether teachers of vocational education could adequately serve special needs students without proper training (Scanlon & Baggett, 1985). “What these young people need in order to become responsible adults are persons that will help them find their talent and abilities and develop them” (Downey, 1985, p. 5), including teachers of agriculture through their SBAE programs.

*The Agricultural Education Magazine* highlighted numerous programs (Downey, 1985; Good-Hamilton, 1985; Toole & Eddowes, 1985; Tyrrell, 1985) which provided opportunities for students with special needs to flourish through modified curriculum and hands-on learning experiences following enactment of the Carl D. Perkins Act of 1984. Good-Hamilton implemented goal-oriented experiences within a horticulture program that emphasized hands-on learning approaches, including leadership and managerial skills. Moreover, some vocational agriculture teachers received disability awareness training through in-service opportunities to help understand better the needs of their students (Toole & Eddowes, 1985). Tyrell wrote of the need for career awareness and opportunities to be made available to all students, and such were of primary importance for not only regular education students, but special education students as well. Tyrell also attributed the successful inclusion of all students to the “educational tone of the program” (p. 17). Cooper, Bocksnick, and Frick (2002) explained: “While slight modification of an activity might be required, it should resemble the activity of mainstream students. Students should never feel that they are being held separate because of their disability” (p. 6).

SBAE teachers were also responsible for accommodating the physically handicapped, such as wheelchair-bound students, including the provision of ramp access to agricultural mechanics facilities and other laboratories, and adapting power equipment to safely accommodate students with disabilities (Bruwelheide, 1985; Daniels & Walker, 1975). In this regard, Bruwelheide stated: “when accommodation of the physically handicapped student into a vocational agriculture program is successful, education and career building experiences are possible” (p. 13). Delks and Sillery (1993) stressed the need for teachers to ensure appropriate facilities and transportation for students with special needs when planning activities outside of the classroom, e.g., field trips.

The 1970s saw an emphasis on providing vocational education for students with disabilities increase the likelihood of them entering the workforce (Curtis, 1975; Steed, 1971). In the early 1970s, vocational agriculture teachers in Mississippi developed programs for students with special needs to acquire the skills needed to take on *blue-collar jobs* that required agricultural mechanics competencies, which filled a void left by the shift toward *white collar jobs* by other program graduates (Steed, 1971). As a result, more disadvantaged or handicapped youth gained employment skills through vocational agriculture education, thus reducing their likelihood of unemployment (Curtis, 1975). In 1988, the Future Farmers of America changed its name to the National FFA Organization to appear more inclusive to students who were not interested in pursuing traditional, production-oriented aspects of agriculture such as farming and ranching (National FFA Organization, 2018b). At this time, the organization also changed its insignia from *Vocational Agriculture* to *Agricultural Education* (National FFA Organization, 2018a). The response from agricultural educators regarding the inclusion of students with special needs during this transition continued to be positive. After 1993 it was nearly two decades (see

Table 3) before *The Agricultural Education Magazine* had another issue themed to highlight the teaching of special needs students. However, articles did appear during this period that positively addressed the topic and described the creation of curriculum for the inclusion of special needs students (Cooper et al., 2002; Filson & Whittington, 2011; Moffitt, 2004; Moore, 2004).

**Instructional Variability, including Hands-on Learning Experiences.** Variability in the agricultural education classroom provides opportunities for students with special needs to be involved in hands-on, enriching course content (Easterly & Myers, 2011; Giffing et al., 2010; Pavelock & Harlin, 2013). “Agricultural education’s variety of teaching methods, authentic instruction, active student response and hands-on approach have the potential to benefit students with disabilities” (Giffing et al., 2010, p. 112). Further, Pavelock and Harlin concluded that “[f]or special needs students, agricultural science classes are an opportunity to learn valuable career skills outside of traditional classroom settings” (p. 6). Students’ learning not only becomes more proficient when they are active in the learning process, but also when their ability levels are matched with appropriate individualized instruction (Easterly & Myers, 2011). In an article describing an SAE program targeting special needs students, Farmer (1993) stated: “Research has found that handicapped and disadvantaged students respond effectively and immediately to proven methods of hands-on teaching” (p. 15). Moreover, allowing special needs students to take part in inquiry-based learning experiences is beneficial by creating opportunities for them to “take charge of their own learning” (Phillips & Myers 2012, p. 10).

The inclusion of students with special needs can benefit other students enrolled in SBAE if teachers are committed to instructional practices that invite *all students* to participate, especially through the use of real-life examples (Curtis, 1975; Giffing & Warnick, 2012). Phillips and Myers (2012) explained: “By providing opportunities for hands-on and active learning . . . teachers can serve a wide range of students who may benefit from agricultural education programs” (p. 10). Giffing and Warnick also stressed that students learn valuable life lessons in SBAE, including those with special learning needs. To this point, Osborne (1993) asserted: “Experience has shown that academically disadvantaged students often perform better in agriculture classes than in other school subjects” (p. 3).

In addition to classroom and laboratory learning experiences, SAEs allow students with special needs to flourish by providing them opportunities to learn through hands-on approaches customized to their unique interests and abilities (Cooper et al., 2002; Moffitt, 2004). Such activities in SBAE can foster positive and satisfying learning experiences for students with disabilities (Farmer, 1993; Giffing et al., 2010; Woehler, 1975). For instance, teaching students “how to water plants, the proper tools to use in a greenhouse and the importance of cleaning up a work area can all be valuable career skills that they may not learn in any other course at school” (Pavelock & Harlin, 2013, p. 6). Cooper et al. further concluded, it was not only the modifications enabling the success of special needs students, but rather “the support and positive influence that a fully integrated agricultural education program can provide” (p. 7). Another example, The Special Lamb Adoption Program, began in 1989 as a way to include students with special needs in a market lamb SAE in Georgia (Farmer, 1993). The program paired a mentor and a special needs student to jointly care for and exhibit the animal at local and area junior livestock shows (Farmer, 1993). The program inspired similar approaches throughout the nation, including other livestock species, and is a positive example of “how the social, intellectual, and physical needs of handicapped students can be met for the benefit of all” (Farmer, 1993, p. 15).

### **Preparation of SBAE Teachers to Serve the Needs of Special Education Students.**

Faulkner and Baggett (2010) reported that 73% of the SBAE teacher preparation programs in their study required a special education course as part of the curricula. Other researchers (Aschenbrener, Garton, & Ross, 2010; Elbert & Baggett, 2003; Faulkner & Baggett, 2010; Giffing et al., 2010; Kessell, Wingenbach, & Lawver, 2009) studied teacher readiness to instruct students with disabilities. In 2010, Giffing et al. assessed the perceptions of Idaho agriculture teachers as related to the inclusion of students with special needs. Their findings indicated the teachers “had the will to include the majority of students with specific disabilities yet lacked the skill to do so successfully” (Giffing et al., 2010, p. 110), and that “the most pressing concern with all students is safety” (p. 111).

From their 2006 study, Dormody, Seevers, Andreasen, and VanLeeuwen concluded that “agricultural education teachers can expect to work with students with all of the types of special needs, and, hence, need to receive pre-service and in-service training on including these students in all aspects of the program” (p. 102). In addition, Giffing et al. (2010) recommended further training, including in-service programs and professional development, to address the needs of students with specific disabilities in agricultural classroom and laboratory settings. Moreover, prospective teachers must be prepared to instruct students with disabilities regardless of the route they take to reach accreditation and enter the teaching profession because “96% of students with disabilities spend at least part of their day in general education classes” (Blanton et al., 2011, p. 7). This would involve courses taught by teachers without special education credentials, including most instructors of SBAE. Although traditionally certified teachers of agriculture earn a specialized credential, they are still considered general education instructors regarding special education students (Blanton et al., 2011). As such, SBAE instructors can serve as the general education teacher of record on a student’s IEP, which describes the services and support provided to help special needs students meet individualized learning goals (Blanton et al., 2011).

To supplement general education teacher credentialing, including individuals credentialed to teach agriculture, the U.S. Office of Special Education Programs funded specialized grants to include special education content in the general teacher education curriculum (Blanton et al., 2011). This funding, which began as early as 1975, “created momentum for preparing general educators to teach students with disabilities and represented an important initial strategy to ensure that general education teachers had the knowledge, skills, and attitudes necessary” (Blanton et al., 2011, p. 20) to effectively teach special needs students. However, the grants reinforced the belief that general education teachers must take a specific and required course in special education because “students with disabilities are so different from their peers that a general education teacher is not qualified to teach them” (Blanton et al., 2011, p. 20). Newly redesigned programs, which more closely matched the ideals and requirements of IDEA and ESEA, were introduced in 2007 to help general education teachers become *highly qualified* and “better equipped to meet the needs of students with disabilities” (Blanton et al., 2011, p. 20).

Crunkilton (1985) stated agricultural education preservice teachers “need to be familiar with the federal, state, and local agencies that can lend assistance when working with the handicapped” (p. 21). Hinders (1995) opined that it was the responsibility of universities to “take an active role in preparing teachers to be competent in meeting the needs of special education students in the general education setting” (p. 206). In support, Blanton et al. (2011) concluded that to improve the learning outcomes of students with special needs, we must invest more in the

preparation of general education teachers. He echoed the views of J. B. Hamilton (1968), who said much earlier that SBAE teachers “must be prepared to work with the less able student” (p. 75).

**Concerns regarding the Inclusion of Special Needs Students in SBAE.** Although most of the literature reviewed indicated the positive aspects of and prospects for special education students enrolling in SBAE, criticisms of inclusion were also articulated over time. Some criticism came from the paucity of teacher preparation for special populations as well as a deficit of the professional support needed to properly accommodate students with special needs (Bruwelheide, 1985). For instance, Bobbitt (1975) concluded: “Those who need training the most should receive top priority and be sought out and assisted if vocational education in agriculture is to meet the true needs of our society” (p. 255). Faulkner (1968) opined that those individuals with severe handicaps whom required high levels of intervention should “not [be] included among the groups vocational education should be serving” (p. 59). Bobbitt along with Croom and Moore (2004) addressed fears of SBAE becoming a *dumping ground* for students unable to succeed in other courses. On the other hand, Bobbitt recognized this as an opportunity to help students who needed the most training, and he challenged vocational agriculture education to “openly recruit disadvantaged and handicapped students who have an interest in agriculture” (p. 255). Filson and Whittington (2011) asserted that “the inclusion of learners with special needs is not only mandated by law, but is a civic and moral duty for secondary agriculture teachers” (p. 10). To remain relevant in U.S. Public Schools, SBAE teachers must be well prepared and know how to effectively embrace and teach *all* students. Or, as Curtis (1975) opined: “Educators must make it happen. The unique history of vocational agriculture and its concern for students makes it appropriate that agriculture lead the way” (p. 243) regarding the inclusion of all students, whether special needs or not. Cooper et al. (2002) succinctly and keenly expressed the importance of supporting students with special needs in SBAE: “Many of these special needs students have simply never heard, ‘You can do it.’” (p. 7).

### Conclusions

At the time of the EAHCA’s enactment, Woehler (1975) stated: “there is no question that the various components of the agricultural education umbrella will *continue* [emphasis added] to play a significant role in teaching the disadvantaged and handicapped” (p. 246). SBAE had served students with special needs prior to the EAHCA (Faulkner, 1968; Grimes & Harlin, 1968; Hamilton, J. B., 1968; Hamlin, 1965; Warmbrod, 1968), but the requirement to do such was further solidified by federal statute in 1975. Through key federal legislation, especially the EAHCA of 1975, students with special needs were launched into mainstream education (Karten, 2008; Katsiyannis et al., 2001). Although preceded by other legislation to benefit individuals with special needs (see Table 1), the act was the driving force for mainstreaming these students into *normal* or regular classrooms (Hudson et al., 1979), including their enrollment in SBAE.

SBAE has provided a special learning space for students with disabilities by providing hands-on learning experiences (Easterly & Myers, 2011; Gaona, 2004; Giffing et al., 2010; Pavelock & Harlin, 2013; Phillips & Myers, 2012). Moreover, it offered an overall positive response to the inclusion of students with special needs following implementation of EAHCA, including the promotion of unique programs in which to involve them (Armbruster, 2012; De Lay & Burden, 2012; Downey, 1985; Farmer, 1993; Filson & Whittington, 2011; Good-Hamilton, 1985; Toole & Eddowes, 1985; Tyrrell, 1985). These efforts were highlighted in eight

issues with related themes, including 63 articles authored by 87 educators, and published over six decades in *The Agricultural Education Magazine* (see Table 3). Teacher educators also provided some focus on the preparation of teachers to properly instruct students with special learning needs, as described in articles published in the *Journal of Agricultural Education* (Aschenbrenner et al., 2010; Dormody et al., 2006; Elbert & Baggett, 2003; Faulkner & Baggett, 2010; Giffing et al., 2010; Kessell et al., 2009). To this point, Faulkner and Baggett stated: “techniques that increase student learning, especially those with learning disabilities, are *expected* [emphasis added] to be used in secondary agricultural education programs” (p. 88). Moreover, “[a]ll students, including those with learning disabilities, are entitled to the best instruction that agricultural education can provide” (Faulkner & Baggett, p. 94).

### **Implications, Recommendations, and Discussion**

More remains to be done for students with special needs who enroll for SBAE and choose to participate in and benefit from the many learning experiences it offers. Whether considering regular instruction, or that intended to serve students with special learning needs, Hinders (1995) admonished: “The education field cannot expect teachers to be comfortable and skilled at addressing varying ability levels in the regular education classroom without experience and training” (p. 206). Therefore, continuing to provide related teacher preparation and in-service professional development is essential. However, a “limited amount of research exists on which modifications and [teaching] methods work best in the SBAE classroom” (Easterly & Myers, 2011, p. 37). Although opportunities for inclusion and modifications for special needs students have been studied, especially regarding the instruction and SAE components of SBAE’s three-circle model, further research should be conducted on the effects of its leadership development component, FFA, with “the ultimate goal of personal growth and practical learning for all students” (Easterly & Myers, 2011, p. 44). This also warrants additional research regarding the training of teachers and advisors to be properly prepared to serve students with special needs.

The enactment of key legislation to assure the inclusion of students with special needs into mainstream classrooms afforded productive, valuable experiences to those students who enrolled in SBAE during the last six decades. With the opportunity to enroll in SBAE and participate in FFA, the young man back in the barns at his county fair was exposed to a program that embraced students with special needs, and helped them to excel in concert with their interests, needs, and abilities. His experiences may have also had a lasting impact on his teacher and fellow classmates, which is another area ripe for research regarding the effects of special needs students on others with whom they interact in SBAE programs. Only time will tell what the future holds, and the impact that SBAE will have on tomorrow’s students with special needs, their communities, and our society overall.

### **References**

- Armbruster, J. (2012). Opportunities for members with special needs National FFA Organization. *The Agricultural Education Magazine*, 84(6), 21-23. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume84/2012\\_05-06.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume84/2012_05-06.pdf)

- Aschenbrener, M. S., Garton, B. L., & Ross, A. L. (2010). Early career agriculture teachers' efficacy toward teaching students with special needs. *Journal of Agricultural Education*, 51(4), 105–117. doi:10.5032/jae.2010.04105
- Blanton, L. P., Pugach, M. C., & Florian, L. (2011). *Preparing general education teachers to improve outcomes for students with disabilities*. (Policy Brief). American Association of Colleges for Teacher Education. Retrieved from [https://www.nclد.org/wp-content/uploads/2014/11/aacte\\_nclد\\_recommendation.pdf](https://www.nclد.org/wp-content/uploads/2014/11/aacte_nclد_recommendation.pdf)
- Bobbitt, F. (1975). Mainstreaming disadvantaged and handicapped students. *The Agricultural Education Magazine*, 47(11), 250, 255. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume47/v47i11.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume47/v47i11.pdf)
- Bruwelheide, K. (1985). Adapting equipment for the handicapped. *The Agricultural Education Magazine*, 57(8), 13-15. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume57/v57i8.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume57/v57i8.pdf)
- Cano, J., & Moore, E. A. (2010). Preparing teachers for diverse audiences. In R. M. Torres, T. Kitchel, & A. L. Ball (Eds.), *Preparing and advancing teachers of agricultural education* (pp. 257-267). Columbus: The Ohio State University, Curriculum Materials Service.
- Cohen, L., & Manion, L. (1994). *Research methods in education* (4th ed.). New York: NY, Routledge.
- Cooper, K., Bocksnick, J., & Frick, M. (2002). Trends in working with special needs students. *The Agricultural Education Magazine*, 75(3), 6-7. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume75/v75i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume75/v75i3.pdf)
- Croom, B., & Moore, G. (2004). Dumping grounds. *The Agricultural Education Magazine*, 77(1), 15-18. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume77/v77i1.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume77/v77i1.pdf)
- Crunkilton, J. R. (1985). Preparing agricultural teachers of the handicapped. *The Agricultural Education Magazine*, 57(8), 19-21. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume57/v57i8.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume57/v57i8.pdf)
- Curtis, S. M. (1975). The case for students with special needs. *The Agricultural Education Magazine*, 47(11), 243-244. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume47/v47i11.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume47/v47i11.pdf)
- Daniels, J. H., & Walker, R. W. (1975). Handicapped and the law. *The Agricultural Education Magazine*, 47(11), 251, 263. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume47/v47i11.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume47/v47i11.pdf)
- Darling-Hammond, L. (2005). Teaching as a profession: Lessons in teacher preparation and professional development. *Phi Delta Kappa*, 87(3), 237–240. doi:10.1177/003172170508700318

- Dawson, J. I. (1971). Making agriculture relevant for the disadvantaged. *The Agricultural Education Magazine*, 43(10), 242-243. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume43/v43i10.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume43/v43i10.pdf)
- De Lay, A. M., & Burden, M. A. (2012, May/June). Making agricultural education a special education for all learners. *The Agricultural Education Magazine*, 84(6), 7-8, 23. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume84/2012\\_05-06.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume84/2012_05-06.pdf)
- Delks, B., & Sillery, B. (1993). How accessible is your agriculture program. *The Agricultural Education Magazine*, 65(9), 12-13, 18. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume65/v65i9.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume65/v65i9.pdf)
- Dieterich, C. A., & Smith, K. (2015). The impact of special education law on career and technical education. *American Secondary Education*, 43(3), 60-72. Retrieved from <http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=6&sid=2931bee9-67a5-4d64-8aad-a5ecac1715ff%40sessionmgr4007>
- Dormody, T. J., Seevers, B. S., Andreasen, R. J., & VanLeeuwen, D. (2006). Challenges experienced by New Mexico agricultural education teachers in including special needs students. *Journal of Agricultural Education*, 47(2), 93-105. doi:10.5032/jae.2006.02093
- Downey, R. S. (1985). Teaching the disadvantaged and handicapped. *The Agricultural Education Magazine*, 57(8), 5-7. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume57/v57i8.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume57/v57i8.pdf)
- Easterly, R. G., & Myers, B. E. (2011). Inquiry-based instruction for students with special needs in school based agricultural education. *Journal of Agricultural Education*, 52(2), 36-46. doi:10.5032/jae.2011.02036
- Education for All Handicapped Children Act, 20 U.S.C. § 1401 (1975).
- Eisenman, L. T. (2000). Characteristics and effects of integrated academic and occupational curricula for students with disabilities. *Career Development for Exceptional Individuals*, 23(1), 105-119. doi:10.1177/088572880002300108
- Elbert, C. D., & Baggett, C. D. (2003). Teacher competence for working with disabled students as perceived by secondary level agricultural instructors in Pennsylvania. *Journal of Agricultural Education*, 44(1), 105-115. doi:10.5032/jae.2003.01105
- Farmer, G. (1993). Georgia's special lamb project adoption program. *The Agricultural Education Magazine*, 66(6), 7, 15. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume66/v66i6.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume66/v66i6.pdf)
- Faulkner, P. E., & Baggett, C. D. (2007). Why diversify the classroom? *The Agricultural Education Magazine*, 80(1), 13-14. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume80/v80i1.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume80/v80i1.pdf)

- Faulkner, P. E., & Baggett, C. D. (2010). Preparing future secondary agricultural education teachers to work with students with learning disabilities: Reports from teacher educators. *Journal of Agricultural Education*, 51(3), 88-99. doi:10.5032/jae.2010.03088
- Faulkner, T. L. (1968). We must serve those being neglected. *The Agricultural Education Magazine*, 41(3), 57, 59. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume41/v41i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume41/v41i3.pdf)
- Filson, C. H., & Whittington, M. S. (2011). Looking through a peephole or an open door?: Insights into inclusion. *The Agricultural Education Magazine*, 84(6), 10-11. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume83/2011\\_05-06.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume83/2011_05-06.pdf)
- Gaona, J. (2004). The effects of the No Child Left Behind Act on career and technical education: Implications for students with special needs. *Journal of Industrial Teacher Education*, 41(2). Retrieved from <http://scholar.lib.vt.edu/ejournals/JITE/v41n2/gaona.html>
- Giffing, M. D., & Warnick, B. K. (2012). Three circle model of inclusion student, parent, and teacher success in agricultural education. *The Agricultural Education Magazine*, 84(6), 11-13. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume84/2012\\_05-06.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume84/2012_05-06.pdf)
- Giffing, M. D., Warnick, B. K., Tarpley, R. S., & Williams, N. A. (2010). Perceptions of agriculture teachers toward including students with disabilities. *Journal of Agricultural Education*, 51(2), 102-114. doi:10.5032/jae.2010.02102
- Good-Hamilton, R. (1985). Plants breed success. *The Agricultural Education Magazine*, 57(8), 8-10. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume57/v57i8.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume57/v57i8.pdf)
- Hamilton, D. A. (1968). Identifying the educationally handicapped. *The Agricultural Education Magazine*, 41(3), 66. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume41/v41i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume41/v41i3.pdf)
- Hamilton, J. B. (1968). Guidelines for developing vocational agriculture programs for youth with special needs. *The Agricultural Education Magazine*, 41(3), 74-75. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume41/v41i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume41/v41i3.pdf)
- Hamlin, H. M. (1965). The meaning of agricultural education. *The Agricultural Education Magazine*, 38(1), 8-9, 17, 21. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume38/v38i1.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume38/v38i1.pdf)
- Harlan, D. L., & Grimes, J. W. (1968). A program for slow learners. *The Agricultural Education Magazine*, 41(3), 58-59. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume41/v41i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume41/v41i3.pdf)

- Higher Education Opportunity Act, Pub. L. No. 110-315 § 205, 122 Stat. 3135 (2008a).
- Higher Education Opportunity Act, Pub. L. No. 110-315 § 206, 122 Stat. 3152 (2008b).
- Hinders, K. (1995). Dual certification and the regular education initiative. *Journal of Teacher Education*, 46(3), 200-208. doi:10.1177/0022487195046003006
- Hudson, F., Graham, S., & Warner, M. (1979). Mainstreaming: An examination of the attitudes and needs of regular classroom teachers. *Learning Disability Quarterly*, 2, 58-62. doi:10.2307/1511026
- Individuals with Disabilities Education Act, Pub. L. No. 101-476, § 104 Stat. 1142 (1990).
- Karten, T. J. (2008). *Embracing disabilities in the classroom*. New York, NY: Skyhorse Publishing.
- Katsiyannis, A., Yell, M. L., & Bradley, R. (2001). Reflections on the 25th anniversary of the Individuals with Disabilities Education Act. *Remedial and Special Education*, 22(6), 324-334. doi:10.1177/074193250102200602
- Kessell, J., Wingenbach, G. J., & Lawver, D. (2009). Relationships between special education confidence knowledge, and selected demographics for agricultural education student teachers. *Journal of Agricultural Education*, 50(2), 52-61. doi:10.5032/jae.2009.02052
- Lee, J. S. (1971). Meeting the needs of the disadvantaged: Is grouping the answer? *The Agricultural Education Magazine*, 43(10), 250-251. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume43/v43i10.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume43/v43i10.pdf)
- McDowell, W. H. (2002). *Historical research: A guide*. Harlow, Essex, England, UK: Pearson Education Limited.
- McMillan, J. H. (2012) *Educational research: Fundamentals for the consumer* (6th ed.). Boston, MA: Pearson Education Limited.
- Moffitt, J. (2004, July/August). Agricultural education . . . EOE? *The Agricultural Education Magazine*, 77(1), 12-14. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume77/v77i1.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume77/v77i1.pdf)
- Moore, G. (2004). The blind man, the elephant, and agricultural education. *The Agricultural Education Magazine*, 77(1), 4-5. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume77/v77i1.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume77/v77i1.pdf)
- National FFA Organization. (2018a). *FFA history*. [Webpage]. Author. Retrieved from <https://www.ffa.org/about/what-is-ffa/ffa-history>

- National FFA Organization. (2018b). *Official FFA manual*. Author. Retrieved from [https://issuu.com/nationalffaorganization/docs/2018-19\\_ffa\\_official\\_manual](https://issuu.com/nationalffaorganization/docs/2018-19_ffa_official_manual)
- O'Reilly, P. A. (1975). *The state planning process in vocational education: Project baseline supplemental report*. Washington, DC: Office of Education (DHEW). Retrieved from <https://eric.ed.gov/?id=ED119027>
- Ortiz, E. (1968). Greenhouse and nursery program for the mentally retarded. *The Agricultural Education Magazine*, 41(3), 71. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume41/v41i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume41/v41i3.pdf)
- Osborne, E. (1993). The bottom line. *The Agricultural Education Magazine*, 66(6), 3,6. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume66/v66i6.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume66/v66i6.pdf)
- Pavelock, M., & Harlin, J. (2013). Differentiation in action: From the lesson plan to the assessment, using differentiated instruction to improve career and technology skills for the modern workplace. *The Agricultural Education Magazine*, 86(2), 4-6. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume86/2013\\_09-10.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume86/2013_09-10.pdf)
- Phillips, B. K., & Myers, B. (2012). Experiential and inquiry-based learning literature search. *The Agricultural Education Magazine*, 84(6), 9-10. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume84/2012\\_05-06.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume84/2012_05-06.pdf)
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: The Free Press.
- Scanlon, D. C., & Baggett, C. D. (1985). . . . Are they being served? *The Agricultural Education Magazine*, 57(8), 4-5. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume57/v57i8.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume57/v57i8.pdf)
- Smith-Hughes Act of 1917, Pub. L. No. 64-347 § 10 (1917).
- Steed, A. T. (1971). Programs for students with special needs. *The Agricultural Education Magazine*, 43(10), 244-245. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume43/v43i10.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume43/v43i10.pdf)
- Toole, P. F., & Eddowes, J. (1985). Support services for handicapped students. *The Agricultural Education Magazine*, 57(8), 10-13. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume57/v57i8.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume57/v57i8.pdf)
- Tyrrell, M. (1985). The land laboratory: Success for the special needs student. *The Agricultural Education Magazine*, 57(8), 17-18. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume57/v57i8.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume57/v57i8.pdf)
- United States Department of Education (USDOE). (2010). *Thirty-five years of progress in educating children with disabilities through IDEA*. Washington, DC: Office of Special Education and Rehabilitation Services. Retrieved from <https://www2.ed.gov/about/offices/list/osers/idea35/history/idea-35-history.pdf>

- Wakefield, D. B., & Talbert, B. A. (2003). A historical narrative on the impact of the New Farmers of America (NFA) on selected past members. *Journal of Agricultural Education*, 44(1), 95-104. doi:10.5032/jae.2003.01095
- Walker, R. W. (1968). Meeting special needs of students through vocational-centered laboratory learning. *The Agricultural Education Magazine*, 41(3), 68-69. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume41/v41i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume41/v41i3.pdf)
- Walls, W. J. (1975). Suggestions for teaching disadvantaged and handicapped. *The Agricultural Education Magazine*, 47(11), 261-263. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume47/v47i11.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume47/v47i11.pdf)
- Warmbrod, J. R. (1968). Onlookers or active participants? *The Agricultural Education Magazine*, 41(3), 55-56. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume41/v41i3.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume41/v41i3.pdf)
- Woehler, W. (1975). Teaching the disadvantaged and handicapped. *The Agricultural Education Magazine*, 47(11), 245-246. Retrieved from [https://www.naae.org/profdevelopment/magazine/archive\\_issues/Volume47/v47i11.pdf](https://www.naae.org/profdevelopment/magazine/archive_issues/Volume47/v47i11.pdf)
- Wonacott, M. E. (2001). Students with disabilities in career and technical education. *ERIC Digest*. Retrieved from <https://eric.ed.gov/?id=ED459324>

## Discussant Remarks

### Teaching Students with Special Needs in School-Based, Agricultural Education: A Historical Inquiry

Discussant: Brian E. Myers, Professor and Chair, University of Florida

It is important that we, as a profession, review and study our past from time to time to better understand not only the “what” of our current programs, but also the “how” and “why.” I commend the authors on an outstanding example of historical research. I would offer that this piece should become required reading in all teacher education programs to help our future agriculture teachers better understand the changes that occurred over time.

Below I’ve provided a few a questions/thoughts for you to consider.

1. In reading this manuscript I was struck by the change over time in vocabulary in the cited pieces in how students with special needs were discussed. What can we glean from noticing things like this? How can we use observations like this in our teacher preparation programs?
2. Although beyond the scope and space limitations of this work, what “outside” factors impacted the various pieces of legislation? In the study of history, I believe it important to attempt to understand the context in which each act played out. How can we use this understanding to help pre-service and in-service teachers better understand the context within we are currently regarding this topic?
3. Historical research is not common in our profession. The reason for this most likely is multifaceted. What suggestions do you have to the profession regarding the need for and the execution of quality historical research in our field? What lessons did you learn as you conducted this research that would be informative to others?
4. My experience would tell me that even though there are numerous legislative actions that support/mandate inclusion of students with special needs, the effectiveness of the implementation of the goals of these policies varies greatly. What is your opinion on how SBAE is implementing the goals of inclusion of students with special needs? Is this implementation uniform or dependent on local situations?
5. As noted in the manuscript and from my own conversations with educators, there have been and still are several in the profession with concerns regarding inclusion of students with special needs. What can be done to help address these concerns and better prepare our teachers for this educational role – both in the instruction of techniques and teaching methods but also in understanding the need/purpose of inclusion?

## **Perceived Self-efficacy for Teaching and Faculty Development Needs of Early Career Faculty at Land Grant Universities**

Lucas Maxwell, Illinois State University  
William A. Bird, University of Tennessee at Martin  
Anna Ball, University of Missouri

### **Abstract**

*The purpose of this study was to describe faculty members' perceived areas of need for faculty professional development in teaching and their self-efficacy for each area. Further, the study examined the relationship between early career faculty members' personal and professional characteristics and their perceived areas of need for faculty professional development in teaching and their self-efficacy. The target population for this study was early career faculty members in colleges of agriculture and related sciences at land grant universities. Of the 51 respondents, most were male between ages 36 and 40, held the rank of assistant professor, and were in their third year. When presented with 25 potential topics for professional development in teaching, respondents agreed that 17 of the topic areas would be helpful to their growth as a teacher. In regard to the remaining eight topic areas, respondents were neutral in their perception of how helpful the topic would be to their growth as a teacher. In terms of self-efficacy for the topic areas, respondents agreed that they were confident in their ability levels for 12 of the items. Respondents were neutral toward 12 of the topic areas and disagreed they were confident in their ability to deliver distance education. When trying to identify predictors of perceived helpfulness of faculty development programming in teaching, a statistically significant relationship between respondents' service appointment was found, but we concluded that no practical conclusions can be drawn from this relationship. Although this study begins to explore the notion of faculty self-efficacy in teaching, it is recommended that further study focus on more clearly defining the impact that self-efficacy has on faculty teaching performance.*

### **Introduction/Frameworks**

Institutions of higher education share a common tripartite mission: teaching, research, and service (Houston, Meyer, & Paewai, 2006; MacKinnon, 2003). These roles, while not always distinctly different, determine how university faculty members allocate their time and resources during their career. Research is often the priority of faculty members, especially at larger research-focused universities (Eaton, Osgood, Cigrand, & Dunbar, 2015). However, many faculty members spend more time dealing with teaching than other portions of their position (Higher Education Research Institute, 1999; Misra, Lundquist, & Templer, 2012). It stands to reason that regardless of the size and focus of a university, effective teaching led by university faculty members are critical in carrying out the mission of postsecondary institutions.

Although faculty members are often experts in their field, this does not mean they will be able to effectively transfer their knowledge to the students in their classrooms (Altany, 2011; Arreola, 2007; Entwistle, 2000). In fact, "university faculty do not receive much training in effective teaching, nor are they exposed to research in student learning" (National Research Council, 2009, p. 7). With increasing pressure on universities to meet the changing needs of

society, the need for faculty members to have the necessary skills to complete their job duties is also increasing. As Camblin and Steger (2000) stated, “Higher educational institutions must redefine themselves and, in essence, that means the faculty must either face obsolescence or continuously be participating in developmental activities” (p. 2).

### **Faculty Development Defined**

Faculty development focuses efforts on the improvement of faculty teaching abilities (Gillespie, 2002; Lancaster, Stein, MacLean, Amburgh, & Persky, 2014; Lattuca, Bergom, & Knight, 2014; Murphy & Jensen, 2016). The notion of faculty development in higher education is not new. Riegle (1987) and Schuster (1990) noted that sabbatical leaves for university faculty have been in existence since the early 1800s in American universities. These sabbatical leaves serve as perhaps the first formal efforts at faculty development. Since the advent of the sabbatical, the aims, goals, and intended outcomes of faculty development programs have changed. Faculty development programs are no longer designed to simply advance one’s knowledge of his or her discipline or increase one’s effectiveness as a teacher (Hubbard & Atkins, 1995). Today, faculty development programs tend to address a broader range of issues aimed at ultimately addressing the long-term success of both the faculty member in terms of teaching, scholarship, and service, as well as the institution as a whole (Blackburn & Lawrence, 1995; Iwasiw, Goldenberg, & Andrusyszyn, 2005; Lattuca et al., 2014; Mohr, 2016; Steinert, 2000). The main goal of all of these efforts is to improve individual faculty members’ teaching effectiveness and overall attitude toward the teaching portion of their appointment.

### **Developing Faculty Teachers**

Teaching is a complex endeavor, and the process of learning to teach occurs over one’s professional career (Beynon, Geddis, & Onslow, 2001; Reid, Sexton, & Orsi, 2015; Slepko, 2008). A review of faculty teaching development literature by Murphy and Jensen (2016) found that faculty members often develop teaching skills in three ways during their career: (a) formal pedagogy courses taken within their PhD graduate program; (b) replicating teaching behaviors experienced while as a student themselves; and (c) workshops or professional meetings required by their university. Most professional development programming is often delivered in short, disjointed sessions that call on teachers to take what they have learned back to their classroom and apply it on their own. Research has shown that this method is ineffective and has not led to large-scale change. Successful professional development must be purposeful and relate directly to the teachers’ perceived needs, be ongoing, and finally be viewed as part of one’s professional growth (Diaz et al., 2009; Guskey, 2000; Mohr, 2016; Slepko, 2008). Ideally, such faculty teaching development initiatives should be offered as long-term, systematic programs through on-campus teaching centers (Sorcinelli, 1994). However, teaching centers are provided at only about 20% of postsecondary institutions in the United States (Cook & Kaplan, 2011).

### **Understanding Faculty Teacher Needs**

If institutions hope to address the issues of accountability in terms of student learning being demanded by consumers, more information is required about faculty needs and perceptions in terms of professional development (Camblin & Steger, 2000; Mohr, 2016; Sorcinelli, 1994; National Research Council, 2009). Only when a clear understanding of faculty members’ perceived needs and preferences regarding delivery of professional development is obtained can

colleges develop and administer effective faculty professional development programming that will equip faculty members with the knowledge and skills they need to address the quality of instruction in their classrooms. With this in mind, it is imperative that colleges of agriculture and related sciences address issues related to the status of professional development, the levels at which faculty are participating in professional development, and the perceived need for specific topics related to teaching and learning.

### **Conceptual Crame**

This study was conceptualized through the lens of research on professional development and the different delivery approaches employed to improve teaching and learning. According to Gillespie (2002), there are three main approaches to improving instruction that are employed on college and university campuses. These three approaches, differentiated from each other by their focus, are faculty development, instructional development, and organizational development. The term professional development loosely refers to some combination of any or all of these three approaches. Faculty development focuses efforts on the improvement of faculty teaching abilities. Instructional development shifts its focus from the individual faculty member to the student by improving actual courses and curriculums. Organizational development takes yet another approach to professional development by focusing efforts toward issues dealing with the overall structure of a department, college, or institution and its relationship to teaching and learning (Gillespie, 2002).

### **Theoretical Frame**

The concept of self-efficacy “refers to personal beliefs about one’s capabilities to learn or perform actions at designated levels” (Schunk, 2004, p. 112). With the introduction of the notion of self-efficacy, Bandura (1977a, 1977b, 1978, 1982, 1986, 1993, 1994, 1995, 1997) posited that an individual’s behavior was governed by more than a simple response to some outside stimuli. How someone behaves is largely a cognitive process where beliefs about one’s perceived abilities as well as the perceived outcomes of a particular behavior are considered. As one’s sense of self-efficacy increases so too does his/her willingness to attempt challenging behaviors (Bandura, 1991, 1993).

Perceptions of one’s ability to perform a task, coupled with one’s beliefs about the expected outcomes that a behavior will produce, influence whether or not they will perform a particular task. Bandura (1977a) explains the distinction between efficacy expectations and outcome expectations by stating “individuals can believe that a particular course of action will produce certain outcomes, but if they entertain serious doubts about whether they can perform the necessary activities such information does not influence their behavior” (p. 193). Although the two concepts do have distinct differences, there does appear to be a link between self-efficacy and outcomes. Individuals who tend to excel at particular tasks generally have higher levels of self-efficacy and in general terms are rewarded for their efforts. The influences of these expectations should not be considered to be the only causes of one’s behavior; however, they are a major factor.

### **Purpose and Objectives**

The purpose of this study was to describe faculty members’ perceptions of and experiences with early career professional development. Further, the study examined the

relationship between early career faculty members' personal and professional characteristics and their perceptions of professional development. The following research objectives were developed to guide the stated purpose.

1. Describe the personal and professional characteristics of faculty in colleges of agriculture and related sciences at selected Midwestern land grant universities (sex, age, teaching appointment percentage, research appointment percentage, extension/service/outreach appointment percentage, rank, discipline, years in a tenure track position).
2. Describe perceived areas of need for faculty development programming for early career faculty members and their perceived self-efficacy for each area.
3. Describe predictors of areas of need for faculty development programming and respondent self-efficacy by early career faculty members' sex, age, teaching appointment percentage, research appointment percentage, extension/service/outreach appointment percentage, rank, discipline, and years in a tenure track position.

### **Methods and Procedures**

The target population for this study was early career faculty members in colleges of agriculture and related sciences. For the purposes of this study we defined early career faculty members as those who had completed seven or fewer years of service in a tenure track position. Several measures were taken to determine the accessible population for this study. First, the researchers obtained a list ( $N = 62$ ) of all universities that were members of the Association of American Universities. From this list, the researchers identified all member institutions that offered programs in agriculture and related sciences ( $N = 16$ ) based on their status as land grant institutions. From this list of 16 institutions, the researchers selected three universities based on several factors including their relative regional proximity, similarities in program offerings, and membership in the same athletic conference.

The frame for this study was obtained from the college of agriculture and related sciences academic programs offices at the selected universities. The researchers contacted the associate dean for academic programs at each institution requesting a list of names and email addresses for all faculty who had completed seven or fewer years of service in a tenure track position and had at least some appointment in the area of teaching. The data collection instrument was used to confirm the total number of years respondents had spent in a tenure track position allowing for further verification of the frame. As a result, the accessible population ( $N = 63$ ) reflects adjustments made after data collection based on respondent reported data. This accessible population was composed of 18 faculty members from Iowa State University, 25 faculty members from the University of Missouri, and 19 faculty members from the University of Nebraska-Lincoln.

Data collection was conducted using an instrument developed by the researcher after a review of related literature. The instrument drew from the work of MacKinnon (2003) in determining the attitudes and perceptions of academic administrators and deans toward faculty development in colleges of pharmacy. Recognizing the inherent differences between colleges of pharmacy and colleges of agriculture and related sciences, the researcher modified the instrument to meet the objectives of this study. While making these modifications the researcher was guided by literature on survey design, teaching strategies, faculty development, and self-

efficacy (Bandura, 1977a; Dillman, 2007; Gillespie, 2002; Golde & Dore, 2004; McKeachie & Svinicki, 2006; National Research Council, 2009).

Prior to administration, the instrument was reviewed by a panel of experts ( $N = 7$ ) in the area of faculty development and questionnaire construction. These experts were charged with evaluating the face and content validity of the instrument. Suggestions from the panel of experts were reviewed and resulted in the final instrument that was used in the study.

Data from a field test were used to determine the reliability of the instrument using a percent agreement measure (Huck, 2008). The instrument was sent to a group of 20 faculty members in the agriculture college at [University], who were not a part of the study frame. Based on these data, the researcher calculated the percent agreement between respondents' answers to each item on the first administration of the instrument and the responses received during the second administration. To calculate the percent agreement, the researcher considered responses that were identical or within one point above or below to be in agreement. This approach is a common practice when employing percent agreement measures to calculate reliability (Birkimer & Brown, 1979; Walkup, Satriano, Hansell, & Olfson, 1998; Fletcher & Sabo, 2006).

For all items ( $N = 69$ ) 87% ( $n = 60$ ) were between 86% and 100% agreement; 99% ( $n = 68$ ) were between 71% and 100% agreement; and 100% ( $N = 69$ ) were between 64% and 100% agreement. It is generally suggested that a percent agreement of 70% is necessary for an item to be considered reliable (Hartmann, 1977; House, House, & Campbell, 1981). Based on these findings, it was determined that the instrument possessed a level of reliability that was acceptable for use in this study.

After receiving IRB approval, early career faculty respondents in the study ( $N = 63$ ) were contacted and asked to complete the questionnaire. Following this initial request, those individuals who had not responded received up to three follow-up emails with a link to the questionnaire asking them to participate in the survey. This study yielded a response rate of 85.48% ( $n = 53$ ). Specifically, 18 of 18 respondents responded from [University], 20 of 25 respondents responded from the [University], and 16 of 19 respondents responded from the [University]. It was found that two of the respondents did not provide usable data, resulting in the final accepting sample of  $n = 51$ . Based on the study response rate it must be acknowledged that non-response error is present; however, according to Linder, Murphy, and Briers (2001), additional methods to control for non-response are not needed when a response rate of 85% is achieved.

This study used descriptive statistics such as means, frequencies, and standard deviations to describe early career faculty members' perceptions of their perceived areas of need for faculty professional development programming, and faculty self-efficacy for each need area. Additionally, stepwise multiple linear regressions were used to help describe predictors of the study's dependent variables using summated variables (perceived helpfulness of teaching professional development topics, perceived self-efficacy for teaching topics) based on selected independent variables (sex, age, teaching appointment percentage, research appointment percentage, service appointment percentage, discipline, and years in a tenure track position).

Stepwise linear regression was utilized because based on available literature there was no reason to rank the variables used in the analysis. According to Agresti and Finlay (1997) this method should be used with caution but is appropriate when "the goal is not to examine

theoretically specified relationships but simply to find a good set of predictors” (p. 533). It should be noted that, as stated earlier, respondents were given the option of selecting “does not apply” for each of the 25 items on the instrument that were used for Objective 3 of this study. As a result the two summated variables, (a) helpfulness of teaching professional development topic to growth as a teacher and (b) self-efficacy for teaching topics, are based on differing numbers of items. For example, if a respondent selected “does not apply” for two of the statements, their summated score was calculated using an  $n$  of 23 items versus 25. Finally, Cohen’s  $d$  (1988) was calculated for each of the descriptors and using Cohen’s descriptors, effect sizes were noted.

## Results

Objective 1 of the study was to describe the personal and professional characteristics of faculty in colleges of agriculture and related sciences at selected Midwestern land grant universities (sex, age, academic appointment, rank, discipline, years in a tenure track position). Table 1 displays selected personal and professional characteristics of early career faculty members. Of the 51 respondents, two thirds were male ( $n = 34$ ; 66.70%). The greatest number of respondents were in the 36–40 years of age range ( $n = 24$ ; 47.10%), followed by 41–45 years ( $n = 11$ ; 21.60%), 31–35 years ( $n = 10$ ; 19.60%), 46–50 years ( $n = 4$ ; 7.80%), 51–55 years ( $n = 1$ ; 2.00%), and no age reported ( $n = 1$ ; 2.00%). The vast majority of respondents held the rank of assistant professor ( $n = 48$ ; 94.10%), while the remaining 5.90% held the rank of associate professor ( $n = 3$ ). Regarding respondents’ discipline, a majority of respondents worked in the natural sciences ( $n = 39$ ; 76.50%) with the remaining respondents working in the social sciences ( $n = 12$ ; 23.50%). The greatest number of respondents ( $n = 13$ ; 25.50%) had been in a tenure track position for three years, followed by four years ( $n = 10$ ; 19.60%), two years ( $n = 9$ ; 17.60%), six years ( $n = 8$ ; 15.70%), five years ( $n = 7$ ; 13.70%), seven years ( $n = 3$ ; 5.90%), and one year ( $n = 1$ ; 2.00%).

Table 1

*Early Career Faculty Respondents’ Sex, Age, Rank, Discipline, and Years in a Tenure Track Position ( $n = 51$ )*

Characteristic	$f$	%
Sex		
Male	34	66.70
Female	17	33.30
Age		
31–35 Years	10	19.60
36–40 Years	24	47.10
41–45 Years	11	21.60
46–50 Years	4	7.80
51–55 Years	1	2.00
Not reported	1	2.00
Rank		
Assistant professor	48	94.10
Associate professor	3	5.90
Discipline		
Natural science	39	76.50

Social science	12	23.50
Years in a tenure track position		
1 year	1	2.00
2 years	9	17.60
3 years	13	25.50
4 years	10	19.60
5 years	7	13.70
6 years	8	15.70
7 years	3	5.90

Means and standard deviations for selected personal and professional characteristics of early career faculty respondents are presented in Table 2. The average percentage of academic appointment in teaching was 37.80% ( $SD = 15.07$ ). Respondents reported an average research appointment of 52.55% ( $SD = 21.24$ ). Additionally, the average percentage of academic appointment devoted to extension/service/outreach was 7.88% ( $SD = 14.54$ ). Finally, respondents had an average of 3.96 years ( $SD = 1.57$ ) of service in a tenure track position.

Table 2

*Early Career Faculty Respondents Academic Appointment and Years in a Tenure Track Position (n = 51)*

Characteristic	<i>M</i>	<i>SD</i>	<i>Range</i>
Academic appointment			
Teaching percentage	37.80	15.07	68
Research percentage	52.55	21.24	80
Extension/service/outreach percentage	7.88	14.54	75
Years in a tenure track position	3.96	1.57	6

Objective 2 was to describe perceived areas of need for faculty development programming for early career faculty members and their perceived self-efficacy for each area. In Table 3, means, standard deviations, and ranges are presented for faculty responses in regard to how helpful the topic area would be for their growth as a teacher. Respondents agreed that 17 of the topic areas would be helpful to their growth as a teacher. In regard to the remaining eight topic areas, respondents were neutral in their perception of how helpful the topic would be to their growth as a teacher. Respondents did not disagree with any topics being helpful to their growth as a teacher.

Table 2

*Respondents Perceived Areas of Need for Faculty Development (n = 51)*

Area of need	<i>M</i>	<i>SD</i>	<i>Range</i>
Using a variety of teaching approaches	4.25	0.66	2
Developing nontraditional evaluation methods	4.18	0.87	4
Evaluating learning	4.14	0.83	3
Understanding learning styles	4.04	1.04	4
Developing a teaching dossier	3.98	0.91	4

Developing effective lectures	3.94	1.01	4
Designing visual aids to enhance learning	3.94	0.93	4
Conducting peer evaluations of teaching	3.88	1.01	4
Mentoring graduate students	3.86	1.15	4
Developing a teaching philosophy	3.86	1.13	4
Developing nontraditional instructional approaches	3.86	1.06	4
Developing test questions	3.84	0.97	4
Improving the instructor/student relationship	3.80	1.13	4
Assessing educational resources	3.78	0.90	4
Developing learning objectives	3.76	1.07	4
Addressing classroom incivilities	3.61	1.15	4
Understanding the roles of an academic advisor	3.53	1.27	4
Designing course content	3.45	1.14	4
Teaching in nontraditional settings	3.27	1.27	4
Meeting a class for the first time	3.22	1.25	4
Advising undergraduate student organizations	3.20	1.27	4
Developing course syllabi	3.14	1.20	4
Using Internet courseware such as Blackboard	3.08	1.29	4
Planning for laboratory instruction	3.00	1.82	4
Delivering distance education	2.92	1.59	4

*Note.* Coded: *Strongly Disagree* = 1.00–1.50, *Disagree* = 1.51–2.50, *Neutral* = 2.51–3.50, *Agree* = 3.51–4.50, *Strongly Agree* = 4.51–5.00.

Table 4 displays means, standard deviations, and ranges for faculty responses in regard to how confident they are in their current ability level for the topic area. In terms of self-efficacy for the topic areas, respondents agreed that they were confident in their ability levels for 12 of the topic areas. Respondents were neutral in their current ability level toward 12 of the topic areas. Finally, when presented with the topic Delivering Distance Education, respondents disagreed ( $M = 2.08$ ;  $SD = 1.16$ ) that they were confident in their current level of ability.

Table 4

*Respondents Self-efficacy for Teaching Topics (n = 51)*

Area of need	<i>M</i>	<i>SD</i>	<i>Range</i>
Designing course content	4.22	0.64	1
Developing course syllabi	4.14	0.72	3
Mentoring graduate students	3.94	0.65	3
Improving the instructor/student relationship	3.92	0.82	4
Meeting a class for the first time	3.80	0.98	4
Developing effective lectures	3.75	0.85	4
Developing learning objectives	3.73	0.85	4
Using Internet courseware such as Blackboard	3.73	0.96	4
Developing a teaching philosophy	3.69	0.79	3
Designing visual aids to enhance learning	3.63	0.89	4
Developing test questions	3.59	0.90	4

Using a variety of teaching approaches	3.57	0.76	3
Understanding learning styles	3.43	0.92	3
Evaluating learning	3.37	0.82	4
Understanding the roles of an academic advisor	3.37	1.20	4
Developing a teaching dossier	3.33	0.82	3
Addressing classroom incivilities	3.29	1.05	4
Assessing educational resources	3.16	0.95	4
Teaching in nontraditional settings	3.06	1.17	4
Conducting peer evaluations of teaching	2.90	1.15	4
Advising undergraduate student organizations	2.90	1.33	4
Developing nontraditional instructional approaches	2.75	1.13	4
Developing nontraditional evaluation methods	2.73	1.02	4
Planning for laboratory instruction	2.73	1.65	4
Delivering distance education	2.08	1.16	4

Note. Coded: *Strongly Disagree* = 1.00–1.50, *Disagree* = 1.51–2.50, *Neutral* = 2.51–3.50, *Agree* = 3.51–4.50, *Strongly Agree* = 4.51–5.00.

The goal of Objective 3 was to describe predictors of areas of need for faculty development programming and respondent self-efficacy by early career faculty members' sex, age, appointment, rank, degree area, and years in a tenure track position. In Table 5, the results of a stepwise multiple linear regression of perceived helpfulness of teaching professional development topics on sex, age, teaching appointment percentage, research appointment percentage, service appointment percentage, and years in a tenure track position are presented. Basic assumptions were tested for by calculating correlations and collinearity statistics. Independent variables that did not have a minimum correlation of  $r = .10$  were excluded from the model (Cohen, 1988). When testing for collinearity, tolerance values less than .30 suggest variables may be correlated, while a value of 1 equals independence. Collinearity statistics were calculated and based on the tolerance levels, no collinearity issues were identified. It should be noted that due to the small sample used in this study the assumption regarding the ratio of independent variables to cases has been violated. As a result, findings should be applied with caution. Based on this model, 7% (adjusted  $R^2 = .07$ ) of the variance in the perceived helpfulness of teaching professional development topics can be explained by service appointment percentage ( $\beta = -.30$ ;  $p = .03$ ). Cohen's  $d$  was calculated to determine effect sizes for the predictor variable using descriptors from Cohen (1988). The independent variable service appointment percentage ( $d = -0.62$ ) was found to have a medium effect. The  $F$  value of 4.82 was found to be significant with a  $p$ -value of .03. The independent variables sex ( $t = 1.10$ ;  $p = .28$ ; Coded: Male = 0; Female = 1), age ( $t = 0.61$ ;  $p = .54$ ; Coded: 31–35 Years = 1, 36–40 Years = 2, 41–45 Years = 3, 46–50 Years = 4, 51–55 Years = 5), teaching appointment percentage ( $t = 1.59$ ;  $p = .12$ ), research appointment percentage ( $t = -0.20$ ;  $p = .84$ ), and years in a tenure track position ( $t = -1.63$ ;  $p = .11$ ) were not significant and therefore were not entered into the model.

Table 5

*Regression of Perceived Helpfulness of Teaching Professional Development Topics on Sex, Age, Teaching Appointment Percentage, Research Appointment Percentage, Service Appointment Percentage, and Years in a Tenure Track Position (n = 51)*

Variable(s) in model	$R$	$R^2$	$b$	$\beta$	$t$	$p$	$d$
----------------------	-----	-------	-----	---------	-----	-----	-----

Characteristic	.30	.09					
Service appointment percentage (Constant)			-0.01	-.30	-2.20	.03*	-0.62
Variable(s) excluded			3.85		39.31	.01*	
Sex <sup>a</sup>					1.10	.28	
Age <sup>b</sup>					0.61	.54	
Teaching appointment percentage					1.59	.12	
Research appointment percentage					-0.20	.84	
Years in a tenure track position					-1.63	.11	

*Note.* Adjusted  $R^2 = .07$  ; for model  $F(1,50) = 4.82$ ;  $p \leq .05$ .

<sup>a</sup>Coded: Male = 0, Female = 1; <sup>b</sup>Coded: 31–35 Years = 1, 36–40 Years = 2, 41–45 Years = 3, 46–50 Years = 4, 51–55 Years = 5.

\* $p \leq .05$ .

### Conclusions, Implications, and Recommendations

The first objective of the study was to describe selected personal and professional characteristics of early career faculty in colleges of agriculture and related sciences at Midwestern land grant universities. From the findings of the study it is concluded that more men (66.70 %) are in the academy than women (33.30%). This conclusion is consistent with data regarding the sex of full-time instructional faculty in agriculture and home economics compiled by the National Center for Education Statistics (2009) that indicates more men (64.60%) than women (35.40%) are in full-time instructional faculty positions. Further, we concluded that on average faculty members have a roughly 50% appointment in research and nearly a 40% appointment in teaching. However, a great deal of variability exists in individual faculty appointments. Finally, with an 85% response rate it can be reasonably concluded that the topic of professional development is important to early career faculty in colleges of agriculture and related sciences given that a previous study has indicated much lower response rates from faculty (Shannon & Bradshaw, 2002).

The second objective was to describe perceived areas of need for faculty development programming for early career faculty members and their perceived self-efficacy for each area. It can be concluded from the findings of this study that early career faculty members generally feel that professional development covering numerous topics related to teaching would be helpful to their growth as a teacher. Specifically, we concluded that faculty agree that professional development in the areas of evaluation, teaching methods, advising and working with diverse learners, and developing the teaching portion of the promotion and tenure dossier would be particularly helpful to their growth as a teacher. Regarding all 25 topic areas, faculty were either neutral or agreed that the topic areas would be helpful to their growth as a teacher, so it can be concluded that overall faculty are receptive to professional development in teaching. These findings seem to be consistent with similar studies of faculty in agriculture colleges (Blickenstaff, Wolf, Falk, & Foltz, 2015).

In terms of respondents' self-efficacy we concluded that respondents were most confident in their abilities to design course content and put together their course syllabi. Given the very focused nature of graduate study, it should not be surprising that faculty members are confident in identifying content that they believe is appropriate for their courses. Generally speaking, we

concluded that respondents were most confident in their ability to perform tasks related to the actual act of teaching (i.e., developing learning objectives, using a variety of teaching approaches, developing effective lectures, etc.). Finally, we concluded that faculty are confident in their ability to mentor graduate students. Regarding all 25 topic areas, we concluded that faculty are generally neutral or agreed that they were confident in their abilities with the exception of delivering distance education. As a result, we concluded that faculty, while not confident in their ability to deliver distance education, are unsure as to the relative importance of the topic.

Objective 3 sought to describe predictors of perceived helpfulness of faculty development programming in teaching and respondents' self-efficacy. We concluded that service appointment percentage was a statistically significant predictor of the perceived helpfulness of teaching professional development topics. Specifically, as one's appointment in extension/service/outreach increases, how helpful they perceive selected topic for teaching professional development to be decreases. We concluded that while a statistically significant relationship does exist, no practical conclusions can be drawn from this finding. Further, we concluded that there is no relationship between the independent variables in this study and the respondents' self-efficacy; therefore, no regression model was produced.

While the respondents are representative of the population, it is implied that perhaps barriers exist that inhibit females from pursuing tenure track faculty positions and land grant universities. Previous study has indicated a lack of female mentors for early career faculty who are female (Sands, Parson, & Duane, 1991). It is reasonable to assume that because of the lack of female in tenure track faculty positions, perhaps, females at the undergraduate and graduate level do not receive the same support and encouragement to pursue tenure track faculty positions. Further, these conclusions imply that there is very little uniformity in terms of the percentage of early career faculty members' appointments that are allocated to teaching, research, and extension/service/outreach. This may suggest that disciplines have varying degrees of value for teaching.

The implications of the conclusions from Objective 2 suggest that ample opportunities exist to provide professional development in teaching that is targeted at specific need areas as identified by early career faculty. Additionally, it is implied that faculty view teaching as a growth process and they believe that continued professional development, even for areas in which they are confident in their ability level, will continue to help them become better teachers. Finally, it is implied that although faculty generally have received little formal education in teaching, they are neutral to positive about their ability levels, suggesting that they are finding other means to build their skill and feelings of self-efficacy regarding teaching.

The conclusions from Objective 3 seem to further imply that perhaps variables beyond the scope of this study are at play that influence how early career faculty members perceive the relative helpfulness of topics related to professional development in teaching. Additionally, it is implied that faculty self-efficacy in teaching is a complex construct that is perhaps not easily explained by common personal and professional characteristics. Finally, these findings may imply that the instrument used to assess faculty perceptions regarding their efficacy for teaching did not accurately measure the construct.

While consistent with previous research regarding the breakdown of men versus women in full-time faculty positions (Blickenstaff et al., 2015), further research on gender issues in

terms of faculty in colleges of agriculture and related sciences should be explored. Specifically, researchers should seek to determine what motivates males and females to pursue graduate education and what differences exist between the two. Further, study should focus on the relationship between individuals who earn graduate degrees and obtain tenure track faculty positions versus those who seek employment in their respective disciplines' private sector. Finally, recruitment efforts should be targeted toward women in an effort to encourage more women to pursue tenure track faculty positions in colleges of agriculture.

Based on the findings, it can be concluded that faculty members generally agree that professional development in topic areas specifically related to teaching would be helpful to their growth as teachers. It is recommended that those charged with providing faculty development in teaching use these findings as a guide to developing future programming to meet the needs of early career faculty members in colleges of agriculture and related sciences. However, although these findings are useful, it is recommended that further research be conducted to gain a more in depth understanding of what faculty need in terms of teaching professional development.

Whereas this study explores the notion of faculty self-efficacy in teaching, it is recommended that further study focus on more clearly defining the impact that self-efficacy has on faculty teaching decisions and performance. Additionally, future research should attempt to identify specific characteristics that might be predictors of faculty self-efficacy in teaching.

#### References

- Agresti, A., & Finlay, B. (1997). *Statistical methods for the social sciences* (3<sup>rd</sup> ed.). Upper Saddle River, NJ: Prentice Hall.
- Altany, A. (2011). Professional faculty development: The necessary fourth leg. *The Teaching Professor*, 25(6), 5.
- Arreola, R. (2007). *Developing a comprehensive faculty evaluation system: A guide to designing, building, and operating large-scale faculty evaluation systems* (3<sup>rd</sup> ed.). Bolton, MA: Anker Publishing Company.
- Bandura, A. (1977a). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215. doi:10.1037/0033-295X.84.2.191
- Bandura, A. (1977b). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1978). The self system in reciprocal determinism. *American Psychologist*, 33, 344–358. doi: 10.1037/0003-066X.33.4.344
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147. doi: 10.1037/0003-066X.37.2.122
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1991). Self-regulation of motivation through anticipatory and self-regulatory mechanism. In R. A. Dienstbier (Ed.), *Perspectives on motivation: Nebraska symposium on motivation* (Vol. 38, pp. 69–194). Lincoln: University of Nebraska Press.

- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*, 117–148. doi: 10.1207/s15326985ep2802\_3
- Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71–81). New York: Academic Press (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. Sand Diego: Academic Press, 1998).
- Bandura, A. (1995). *Self-efficacy in changing societies*. New York: Cambridge University Press.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Beynon, C. A., Geddis, A. N., & Onslow, B. A. (2001). *Learning-to-teach: Cases and concepts for novice teachers and teacher educators*. Toronto, ON: Pearson.
- Birkimer, J. C. and Brown, J. H. (1979), Back to basics:: Percentage agreement measures are adequate, but there are easier ways. *Journal of Applied Behavior Analysis, 12*, 535-543. doi:10.1901/jaba.1979.12-535
- Blackburn, R., & Lawrence, J. (1995). *Faculty at work: Motivation, expectation, satisfaction*. Baltimore, MD: The Johns Hopkins University Press.
- Blickenstaff, S. M., Wolf, K. J., Falk, J. M., & Foltz, J. C. (2015). College of agriculture faculty perceptions of student skills, faculty competence in teaching areas and barriers to improving teaching. *NACTA Journal, 59*(3), 219–226. Retrieved from <http://libproxy.lib.ilstu.edu/login?url=https://search.proquest.com/docview/1731202973?accountid=11578>
- Camblin, Jr., L. D., & Steger, J. A. (2000). Rethinking faculty development. *Higher Education, 30*(1), 1–18. doi: 10.1023/A:1003827925543
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cook, C. E., & Kaplan, M. (Eds.) (2011). *Advancing the culture of teaching on campus: How a teaching center can make a difference*. Sterling, VA: Stylus.
- Diaz, V., Garrett, P. B., Kinley, E. R., Moore, J. F., Schwartz, C. M. & Kohrman, P. (2009). Faculty development for the 21st century. *EDUCAUSE Review, 44*(3), 46–55.
- Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). New York: Wiley.
- Eaton, C. K., Osgood, A. K., Cigrand, D. L., & Dunbar, A. L. (2015). Faculty perception of support to do their job well. *InSight: A Journal of Scholarly Teaching, 10*, 35–42. Retrieved from <http://insightjournal.net/>
- Entwistle, N. (2000). Approaches to studying and levels of understanding: The influences of teaching assessment. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 156–218). New York: Agathon Press.
- Fletcher, K. L., & Sabo, J. (2006). Picture book reading experience and toddler’s behaviors with photographs and books. *Early Childhood Research and Practice, 8*(1). Retrieved from: <http://ecrp.uiuc.edu/v8n1/fletcher.html>.

- Golde, C. M., & Dore, T. M. (2004). The survey of doctoral education and career preparation: The importance of disciplinary contexts. In D. H. Wulff, A. E. Austin, & Associates, (Eds.), *Path to the professoriate: Strategies for enriching the preparation of future faculty*. San Francisco: Jossey-Bass.
- Gillespie, K. H. (Ed.). (2002). *A guide to faculty development: Practical advice, examples and resources*. Bolton, MA: Anker Publishing Company, Inc.
- Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.
- Hartmann, D. (1977). Considerations in the choice of interobserver reliability estimates. *Journal of Applied Behavioral Analysis, 10*(1), 103–116. doi: 10.1901/jaba.1977.10-103
- Higher Education Research Institute. (1999). *The American college teacher: National norms for the 1998-1999 HERI faculty survey*. Los Angeles: University of California, Los Angeles.
- House, A., House, B., & Campbell, M. (1981). Measures of interobserver agreement. Calculation formulas and distribution effects. *Journal of Behavioral Assessment, 3*(1), 37–57. doi: 10.1007/BF01321350
- Houston, D., Meyer, L. H., & Paewai, S. R. (2006). Academic staff workloads and job satisfaction: Expectations and values in academe. *Journal of Higher Education Policy and Management, 28*(1), 17–30. doi: 10.1080/13600800500283734
- Hubbard, G. T., & Atkins, S.S. (1995). The professor as a person: The role of faculty well-being in faculty development. *Innovative Higher Education, 20*(2), 117–128. doi: 10.1007/BF01189643
- Huck, S. W. (2008). *Reading statistics and research* (5<sup>th</sup> ed.). Boston, MA: Pearson Education, Inc.
- Iwasiw, C., Goldenberg, D, & Andrusyszyn, M. (2005). *Curriculum development in nursing education*. Mississauga, ON: Jones and Bartlett Publisher, Inc.
- Lancaster, J. W., Stein, S. M., MacLean, L. G., Amburgh, J. V., and Persky, A. M. (2014). Faculty development program models to advance teaching and learning within health science programs. *American Journal of Pharmaceutical Education, 78*(5), 1–7. doi: 10.5688/ajpe78599
- Lattuca, L. R., Bergom, I., & Knight, D. B. (2014). Professional development, departmental contexts, and use of instructional strategies. *Journal of Engineering Education, 103*(4), 549–572. doi: 10.1002/jee.20055
- Linder, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social research. *Journal of Agricultural Education, (42)*4, 43–53. doi: 10.5032/jae.2001.04043
- MacKinnon, III, G. E. (2003). Administrator and dean perceptions toward faculty development in academic pharmacy. *American Journal of Pharmaceutical Education, 67*(3), 1–14. doi: 10.5688/aj670397

- McKeachie, W. J., & Svinicki, M. (2006). *Teaching tips: Strategies, research and theory for college and university teachers* (12<sup>th</sup> ed.). Boston, MA: Houghton Mifflin Company.
- Misra, J., Lundquist, J. H., & Templer, A.. 2011. "Gender, work time, and care responsibilities among faculty." *Sociological Forum*, 27(2): 300–323. doi: 10.1111/j.1573-7861.2012.01319.x
- Mohr, S. (2016). *Best practices for online faculty professional development in higher education teaching and learning centers: A delphi study* (Order No. 10250343). Available from ProQuest Central. (1902236737). Retrieved from <http://ezproxy.utm.edu/login?url=https://search.proquest.com/docview/1902236737?accountid=29025> (Dissertation).
- Murphy, C. A., & Jensen, T. D. (2016). Faculty teaching development: Using the multidimensional matrix of teaching development to guide teaching improvement activities. *Journal of Effective Teaching*, 16(2), 61–75.
- National Research Council. (2009). *Transforming agricultural education for a changing world*. Washington DC: The National Academies Press.
- Reid, L. F., Sexton, J., & Orsi, R. (2015). Outcomes of a faculty development program promoting scholarly teaching and student engagement at a large research-intensive university. *The Journal of Faculty Development*, 29(3), 23–35. Retrieved from <http://ezproxy.utm.edu/login?url=https://search.proquest.com/docview/1776689554?accountid=29025>
- Riegle, R. (1987). Conceptions of faculty development. *Educational Theory* 37(1), 53–59. doi: 10.1111/j.1741-5446.1987.00053.x
- Sands, R. G., Parson, L. A., & Duane, J. (1991). Faculty mentoring faculty in a public university. *Journal of Higher Education*, 62(2), 174-193. doi: 10.1080/00221546.1991.11774114
- Schunk, D. H. (2004). *Learning theories: An educational perspective* (4<sup>th</sup> ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- Schuster J. (1990). The need for fresh approaches to faculty renewal, In J. Schuster, D. Wheeler, & Associates (Eds.), *Enhancing faculty careers: Strategies for development and renewal*. (pp. 3–19). San Francisco, CA: Jossey Bass Publishers.
- Shannon, D. M., & Bradshaw. C. C. (2002). A comparison of response rate, response time, and costs of mail and electronic surveys. *Journal of Experimental Education*, 70(1), 179-192. doi: 10.1080/00220970209599505
- Slepkov, H. (2008). Teacher professional growth in an authentic learning environment. *Journal of Research on Technology in Education*, 41(1), 85–111. doi: 10.1080/15391523.2008.10782524
- Sorcinelli, M. D. (1994). Effective approaches to new faculty development. *Journal of Counseling & Development*, 72(5), 474–479. doi: 10.1002/j.1556-6676.1994.tb00976.x

Steinert, Y. (2000). Faculty development in the new millennium: Key challenges and future directions. *Medical Teacher*, 22(1), 44–50. doi: 10.1080/01421590078814

Walkup, J., Satriano, J., Hansell, S., & Olfson, M., (1998). Practices related to HIV risk assessment in general hospital psychiatric units in New York state. *Psychiatric Service* 49, 529–530. doi: 10.1176/ps.49.4.529

## **Discussant Remarks**

### **Perceived Self-efficacy for Teaching and Faculty Development Needs of Early Career Faculty at Land Grant Universities**

Discussant: J. Shane Robinson, Oklahoma State University

#### **Overview/Context**

The purpose of the study was to describe the perceptions of and experiences with professional development of early career faculty members in the College of Agriculture at three different land-grant institutions. A secondary purpose was to examine the relationships between faculty's perceptions and their personal and professional characteristics. The respondents identified numerous topics they perceived would be helpful to their growth as a teacher. Faculty ranked the item, "using a variety of teaching approaches," as the area of greatest need for professional development. The item that faculty ranked last regarding their self-efficacy and need for learning was "delivering distance education."

#### **Strengths**

- The Introduction included a compelling need for offering professional development opportunities to early career faculty instructors.
- Mechanically, I felt the paper was strong. It was an easy read and included numerous, appropriate citations.
- This study included a solid review of the literature on faculty development and was undergirded in Bandura's (1998) Self-Efficacy theory, a reputable and well-respected theory, pertinent for the study's focus.
- In general, I found the Methods section to be highly detailed and easy to follow. I appreciated the authors' attempts to clarify the procedures of the study in a clear and transparent fashion, especially in regard to explaining the measures taken to ensure the instrument's reliability.

#### **Questions for Consideration**

After reading the manuscript, a number of questions arose regarding the study.

- I struggled a bit understanding the congruence of the study's purpose and its objectives. For example, the purpose of the study appeared to warrant an evaluation of a professional development program. However, the objectives seemed to be asking faculty to identify their needs for professional development. This issue may be one of semantics; however, I believe clarification is needed.
- Although, in the main, the Methods section was well done, I became confused regarding one of the criteria used to select the universities that would participate in the study. The authors stated that three land-grant institutions from "the same athletic conference" (p. 4) were selected. Yet, the three institutions identified are not part of the same conference. In fact, they represent three different conferences. Please clarify.

- Regarding the instrument employed and items therein, what are examples of “nontraditional instructional approaches” and “nontraditional settings”?
- As for the faculty studied, do they teach primarily lecture-based or lecture/laboratory-based courses? What impact did faculty’s teaching appointments and previous teaching experiences have on their self-efficacy? Additionally, is there an expectation for faculty to teach online courses? What effect, if any, do you believe the answers to these questions had on these faculty’s perceptions and responses regarding self-efficacy?
- What other, additional and external variables might contribute to how early career faculty members perceive the relative helpfulness of topics related to professional development in teaching? How did class size (i.e., small versus large lecture classes), class type (i.e., introductory course versus a course in students’ major), and class level (i.e., freshman versus senior course as well as a one credit-hour versus a three credit-hour course)?

### **Summary**

Overall, I found this manuscript to be conducted and written well. I applaud the authors for investigating an important and relevant topic. Parents expect their children to receive a high quality education when they enroll in a university. I believe faculty are obligated to provide that. Unfortunately, various faculty have no formal pedagogical training and are left overwhelmed and confused about how to teach effectively. This study is important, as it shed light on some areas faculty feel most and least efficacious regarding their teaching expectations. The most eye-opening finding to me was how little regard faculty had for distance education. Not only did they rank it last regarding their perceived efficacy, they also ranked it last as an area of need for professional development. Basically, they do not feel efficacious to teach online, and they do not want to learn how to do it. In an era where learning has becoming more globalized and information is only a click away, I am curious as to why faculty at these three institutions are not interested in improving their confidence in learning how to teach online, via distance education.

## Exploring Learning Styles Expressed In Teaching Philosophies Among Agricultural University Teaching Faculty

Tyler D'Angelo, University of Florida  
Jessica Harsh, Abraham Baldwin Agricultural College, Tifton  
J.C. Bunch, University of Florida  
Alexa Lamm, University of Georgia  
Andrew Thoron, University of Florida  
Grady Roberts, University of Florida

### Abstract

*Faculty at universities must prepare students to successfully enter the workforce. Preparing students requires effective teaching, but excellence in teaching is complex and can be difficult to achieve. To capitalize on excellent and effective teaching, a teaching philosophy is necessary to embody the teaching faculty members' personal philosophy of student learning in the classroom. The purpose of this study was to explore if a faculty members' preferred learning style is expressed in his or her teaching philosophy statement. Using a mixed methods research design, findings revealed a majority of university faculty members identified an assortment of learning styles based on their teaching philosophy statements. It is recommended that university teaching faculty members engage in professional development opportunities that enhance their teaching philosophy. Experienced university teaching faculty with a diverse teaching philosophy should mentor early-career teaching faculty in developing instruction that incorporates all four learning styles.*

**Keywords:** faculty, learning style, teaching philosophy

### Introduction

The United States workforce is expected to have more people with post-secondary, higher education degrees in the next several years (Georgetown University, 2014). Jobs in the United States will continue to demand post-secondary degrees; by 2020, 65% of jobs will be held by employees with a post-secondary education compared to 59% and 28% of jobs in 2010 and 1973 (Georgetown University, 2014). University teaching faculty must prepare students to enter the workforce successfully (Sankey & Foster, 2012). Preparing students requires effective teaching, but excellence in teaching is complex and can be difficult to achieve (Andrews, Garrison, & Magnusson, 1996). Excellent teaching requires, "content expertise and methodological technique, as well as about participants in the educational enterprise valuing and achieving quality outcomes" (Andrews et al., 1996, p. 101). To capitalize on excellent and effective teaching, a faculty member should have a teaching philosophy statement that embodies the personal belief of student learning in the classroom (Schonwetter, Sokal, Friesen, & Taylor, 2002). Not only is a teaching philosophy important for guiding student learning, but teaching philosophies have become a requirement for faculty position applications (Schonwetter et al., 2002).

A teaching philosophy can simply be defined as written statements delineating beliefs and principles of the teacher to guide teaching and learning (Fitzmaurice & Coughlan, 2007). More specifically, a “teaching philosophy statement is a systematic and critical rationale that focuses on the important components defining effective teaching and learning in a particular discipline and/or institutional context” (Schonwetter et al., 2002, p. 84). A teaching philosophy should describe why the instructor teaches the way that they do and defines the goals or beliefs that support their teaching (Fitzmaurice & Coughlan, 2007). Overall, a teaching philosophy should clarify “(a) what good teaching is, (b) provide a rationale for teaching, (c) guide teaching behaviors, (d) organize the evaluation of teaching, (e) promote personal and professional development, and (f) encourage the dissemination of effective teaching” (Schonwetter et al., 2002, p. 87).

A sound teaching philosophy should address six main areas in the written document. These key areas include: (a) definition of teaching, (b) definition of learning, (c) view of the learner, (d) goals and expectations of the student-teacher relationship, (e) discussion of teaching methods; and (f) discussion of evaluation (Schonwetter et al., 2002). A well-written teaching philosophy statement can bring to light the multifaceted interaction between the educator and students and combine personal characteristics, context of the education, and learning ideologies to result in effective teaching (Schonwetter et al., 2002). Traditionally, those applying for teaching jobs at the university level do not receive adequate guidance when writing a teaching philosophy, even if it is an application requirement (Schonwetter et al., 2002). A teaching philosophy can serve as a point of evaluation for not only self-reflection, but also for administration (Schonwetter et al., 2002). A teaching philosophy statement can serve as an evaluation form when a faculty member moves through the tenure and promotion process.

Since a teaching philosophy stresses the importance of the relationship between teaching and learning, the educators’ own learning style should be considered when evaluating their teaching philosophy. Currently, there is limited research on how teaching faculty members’ own learning styles are expressed in their teaching philosophy.

### **Conceptual Framework & Literature Review**

Kolb’s (1984) learning styles served as the conceptual framework guiding this research. Learning styles are derived from experiential learning theory, originally coined by Dewey (1938) and later elaborated on by Kolb (1984). These styles are considered a state rather than a type to account for the individuality humans possess (Kolb, 1984). According to Kolb (1984), learning occurs through a process where new experiences continually shape and influence acquired knowledge. In order for any learning to occur, a person must move through various aspects of the learning cycle to attain knowledge (Kolb, 1984). These stages, or learning modes, follow four main points: (a) concrete experience, (b) reflective observation, (c) abstract conceptualization, and (d) active experimentation (Kolb, 1984). When a person enters the concrete experience stage feelings are emphasized over thinking because of the direct involvement with the experience (Kolb, 1984). Next, in the reflective observation stage, one typically observes and focuses on reflecting about the concrete experience. During this phase of the learning cycle, understanding phenomenon is emphasized more than technical application (Kolb, 1984). After reflecting, a person places more importance on thinking rather than feeling in the abstract conceptualization stage. Generalizations and hypotheses are formed to analyze the experience in a systematic way

(Kolb, 1984). Finally, in the learning cycle, the person actively experiments with the results of the conceptualization, which create new experiences. An emphasis is placed on doing and practical application as opposed to observing and reflection (Kolb, 1984). Once the person completes this last stage, the cycle of learning begins again with the new experience created in the active experimentation stage (Kolb, 1984). A learning style may also be classified as either diverging, assimilating, converging, or accommodating (Kolb & Kolb, 2005).

When a person has a convergent learning style, their strong learning abilities lie in abstract conceptualization and active experimentation (Kolb, 1984). People who fall in this learning style appreciate the real world application of learning through solving problems and decision-making (Kolb, 1984). They prefer single answer problems and questions (Kolb, 1984). In addition, people with a convergent learning style do not prefer to handle social and interpersonal situations, but would rather solve technical problems (Kolb, 1984). Opposite of the convergent learning style is a person who has tendencies of the divergent learning style. A divergent learning style places emphasis on concrete experience and reflective observation (Kolb, 1984). People with a divergent learning style value creative processes and the ability to make meaning of the world around us (Kolb, 1984). Therefore, observing is done more than action from those with a divergent learning style. Someone with a divergent learning style is able to take many perspectives and relationships and put them into a meaningful form. Divergent learning styles excel with brainstorming activities and take an interest in relating to people while being feeling-oriented and imaginative (Kolb, 1984).

Next, the other two learning styles, assimilation and accommodative, are also opposites of each other. When a person has an assimilation learning style, they focus on abstract conceptualization and reflective observation (Kolb, 1984). Much like a convergent learning style, learners with an assimilation learning style focus less on practical implications and are concerned with logical theory, ideas, and abstract concepts. Assimilation people also have strengths in inductive reasoning and their ability to make observations and explanations in the form of a theoretical model (Kolb, 1984). Conversely, the accommodative learning style emphasizes concrete experience and active experimentation. This type of learning style instigates doing tasks, carrying out plans, and getting into new experiences, as opposed to reflecting on experiences (Kolb, 1984). Those with an accommodative learning style will adapt immediately to changes. People who exhibit an accommodative learning style rely on people and do relate to them, but they also solve problem using trial-and-error verses analyzing the experience on their own (Kolb, 1984).

Previous literature has shown those with certain learning styles exhibit learning differently, and they prefer different learning methods. In one study, researchers investigated the relationship between learning style and learning preferences (Loo, 2004). Results indicated convergers preferred to work in groups more than assimilators, and divergers preferred to partake in applied experiences more than assimilators (Loo, 2004). Both of these findings are concurrent with Kolb's (1984) descriptions of these styles. Doing learning types, such as accommodating and converging learning styles, favored participating in group work significantly more than diverging and assimilating learning styles (Loo, 2004). Between all learning types, hands-on type experiences and problem solving were preferred methods of learning as opposed to writing or presenting on a topic (Loo, 2004). Recommendations from this study included using many learning methods in the classroom. Instructors should not focus on the link between learning

style and method, specifically, but rather create a classroom that encompasses a variety of teaching and learning methods (Loo, 2004).

In a more recent study, undergraduate students who participated in an international experience reflected on their personal learning style through their reflective journals (Lamm et al., 2011). Through a content analysis of the participants' journals, students were found to have similar tendencies outlined by Kolb (1984) for each of the four learning styles they identified with through the Kolb Learning Style Inventory (LSI). In this study, assimilators were found to be organized, orderly, and logical (Lamm et al., 2011). Lamm et al. (2011) noted the respondents that identified as assimilators lacked personal reflection in their journals, which is concurrent with Kolb's interpretation of someone with an assimilation learning style (Kolb, 1984). Assimilators, in this study, preferred both lecture and field work. Students who identified as divergers also followed suit in Kolb's learning style description. These students were much more focused on interactions with people, asking questions, expressing their feelings through their reflections. They also expressed open-mindedness through their reflections (Lamm et al., 2011). Those with a divergent learning style, however, countered Kolb's description of a diverger by not enjoying working in groups (Lamm et al., 2011). Accommodators placed an emphasis on personal communication and enjoyed time with the local Costa Ricans. Furthermore, accommodators preferred physically engaging in the lessons as opposed to classroom work time (Lamm et al., 2011). Finally, convergers demonstrated typical traits of being logical and methodical in their journaling (Lamm et al., 2011). Personal relationships were not included in their reflections, and the reflections were not necessarily reflective but more of a recap of what occurred that day. Convergers stated that they enjoyed hands-on learning, but also appreciated scientific data and the background information on topics discussed (Lamm et al., 2011).

Smith and Rayfield (2017) examined how learning style can transition from being a student in the classroom to a student teacher. Overall, results showed after the student teacher experience, more students fell into the initiating style, which is a part of the accommodating style (Smith & Rayfield, 2017). The largest mean change for learning mode before and after the student teaching experience was active experimentation (doing). The researchers discovered no student scored exactly the same from pre- to post-test when given the learning style inventory, indicating there was change for all students' learning styles prior to and after student teaching (Smith & Rayfield, 2017). Based on these findings, Smith and Rayfield (2017) suggested learning styles can be a helpful tool in placing student teachers in cooperating schools, thus serving as a guide for student teachers to reach their full potential.

Sankey and Foster (2012) conducted a content analysis of award-winning educators and found 11 key elements that were similar across the teaching philosophies. Most educators in the study ranked as full professor, had a 26 to 75% teaching appointment, and all were teaching faculty within a college of agricultural and life sciences. The elements were student centeredness; instructional variabilities; build student rapport; conducive learning environment; professional teaching commitment; enthusiasm; expert in subject matter; role model; organization and clarity; provide learning opportunity; and technological integration (Sankey & Foster, 2012). However, they raise the question could a teacher actually identify these traits in the classroom. Sankey and Foster (2012) also stress the importance that if an element is not present in the philosophy, it probably is not being practiced in the classroom. Therefore, not practicing these critical teaching beliefs and attitudes could impact student achievement (Sankey & Foster, 2012).

Another study looked at the actual strategies educators used in the classroom to prepare students with applied skills employers deemed as important to enter the workforce (Rateau, Kauffman, & Cletzer, 2015). These strategies reflected the elements found in the teaching philosophy element found in Sankey and Foster's (2012) study. These strategies included: "(a) demonstrate an enthusiasm for student learning; (b) experiment actively with new ideas for educational practice; (c) approach teaching with a guiding mentality more than a directing mentality; (d) foster student ownership of learning; (e) stay abreast of new developments in recommended educational practices; and (f) invest time and resources to overcome barriers to change" (Rateau et al., 2015, p. 59). Rateau et al. (2015) claim these strategies help students gain critical thinking, problem solving and teamwork skills by the educator incorporating these strategies into the classroom and ultimately their teaching philosophy.

Furthermore, it is critical to recognize the teaching faculties members' own learning style present in their teaching philosophy because one study indicated architecture students' learning styles can be changed by the influence of their teachers' own learning style (Tucker, 2008). Tucker (2008) cited other researchers who implied students with matching learning styles as their teachers have higher achievements in the classroom as opposed to a student with an opposing learning style. In this study, most teachers fell in the *Southern* dimension (converging and assimilating) of Kolb's Learning Cycle (Tucker, 2008). From the results of this study, Tucker (2008) claimed we might be preparing students to be academics verses practitioners with the shift of learning style that eventually matches the teachers. Therefore, it is critical for educators to be aware of their own learning style and how it is reflected in their teaching philosophy. Their own learning style may be influencing their teaching style and philosophy, which could either promote or inhibit some students' success in the classroom. Eventually, if not addressed, it could affect the success of the student past the classroom.

### **Purpose & Objectives**

The purpose of this study was to explore if a faculty members' preferred learning style is expressed in his or her teaching philosophy statement. The following objectives guided this study:

1. Determine the learning style for each university teaching faculty;
2. Determine if personal learning style of university teaching faculty influences their teaching philosophy.

The American Association for Agricultural Education (AAAE) National Research Agenda Priority Area 4: Meaningful, Engaged Learning in All Environments indicated that, "understanding of learning and teaching environments could result in the development of present day best practices and research-based pedagogies" (Edgar, Retallick, & Jones, 2016, p. 39).

### **Methods**

A convergent mixed methods design was used for this study (Creswell & Creswell, 2018). A quantitative instrument was used to measure university faculty members' preferred learning style. University faculty members submitted their teaching philosophy documents that were used for qualitative data analysis based on learning style themes.

University of Florida faculty members ( $N = 30$ ) were voluntarily enrolled in the teachers college course. The purpose of the course was to assist University of Florida faculty members engage in interdisciplinary efforts to improve teaching skills by engaging in best practices for learner-centered instruction. The course addressed a plethora of topics in teaching and learning, which included the duties and responsibilities of University of Florida teaching faculty, the tools for creating a well-developed teaching philosophy statement, and reflecting on instructional pedagogies used in the classroom. The faculty members met for 11 weekly, face-to-face meetings during the fall semester. Faculty members with teaching and learning expertise, as well as the Dean and Associate Deans, facilitated the meetings. Faculty members were expected to complete eight course assignments throughout the course. Some examples of course assignments included: (a) daily lesson plan, (b) course syllabi, (c) teaching philosophy statement, and (d) department and program goals. Twenty of the 30 faculty members who participated in the program consented to participating in this study. Thus, 67% of the participating faculty were represented in the study. The faculty who participated in the study were mostly male ( $f = 13$ ; 65%), at the Assistant Professor rank ( $f = 20$ ; 100%), and held at least a 10% teaching appointment in the college ( $f = 20$ ; 100%).

### **Instrumentation**

University of Florida faculty members were asked to develop a teaching philosophy statement as an assignment for the course. Faculty members were asked to address the following questions in developing their teaching philosophy statement: (a) What do you teach?, (b) Why do you teach?, (c) How do you view students?, (d) How do you teach?, and (e) How do you know if you have been successful? The teaching philosophy statements submitted were each approximately one to two pages in length.

In addition to teaching philosophy statements, faculty members were asked to complete the Kolb Learning Style Inventory (LSI; Kolb, 2007). The instrument consists of 12-items and determines the respondents' preferred learning style as either (a) accommodating, (b) diverging, (c) assimilating, or (d) converging (Kolb, 2007). The items measure how respondents prefer learning experiences, either through concrete experiences (CE) or abstract conceptualization (AC). Further, respondents are grouped based on how they deal with learning experiences — either through reflective observation (RO) or active experimentation (AE). The 12-items measure respondents' agreement to a series of statements on a 4-point ranking scale ranging from 1 = *Least Like You* to 4 = *Most Like You*. Respondents' are grouped into one of the four learning styles based on their total raw scores, which consists of a total score of 120. The reliability estimates were calculated *a priori* using Cronbach's alpha. The reliability estimates for the constructs of interest were  $\alpha = .82$  for the concrete experiences score,  $\alpha = .83$  for the abstract conceptualization score,  $\alpha = .73$  for the reflective observation score, and  $\alpha = .78$  for the active experimentation score.

### **Data Analysis**

Quantitative data was collected and analyzed for scores based on how respondents take in experience (AC minus CE), and how respondents deal with experience (AE minus RO). Using these scores, respondents were grouped into one of the four learning styles. Data was further analyzed using SPSS Statistics 25 to provide descriptive statistics on the learning styles of each

university teaching faculty, thus providing further insight in the investigation of objective one. To analyze the qualitative piece, the 20 teaching philosophy statements were coded for key words, phrases, and sentences through a content analysis of learning styles using MAXQDA 2018. The characteristics of each learning style used in each philosophy were detailed in the literature review. A content analysis was chosen for objective two to understanding of the characteristics of each learning style in the faculty members teaching philosophy (Ary, Jacobs, & Sorensen, 2010). Content analyses are used to draw inferences and determine the frequency of themes in the piece of communication, and more specifically, teaching philosophies in this study (Riffe, Lacy, & Fico, 2005).

Two graduate students and a faculty member analyzed each teaching philosophy statement by coding each learning style by its characteristics present. Two coders were used to analyze the data in order to lessen researcher bias and ensure the results were reliable (Ary et al., 2010). Both coders were familiar with Kolb’s learning style, which served as the training of the coders (Ary et al., 2010). The coders analyzed four, randomly selected philosophies together (20%) as part of the training to ensure inter-coder reliability (Lombard, Snyder-Duch, & Bracken, 2002). After the learning styles presented in the teaching philosophy statements were identified by each coder, the two coders went through each code to ensure congruency on identified learning styles. Using the teaching philosophy statements, coders determined each participants’ learning style based on the aggregate number of learning styles identified in the teaching philosophy statements. Respondents who were exclusively coded as having two equally identified learning styles were reported as exhibiting both learning styles based on their teaching philosophy statement. Participants who were identified as having numerous learning styles without a rich concentration in one learning style in their teaching philosophy statement were identified as inconclusive. The qualitative data collected from the teaching philosophy statements and the quantitative data collected from the LSI were then compared in the findings section.

## Findings

### Learning Style Identification

For objective one, descriptive statistics were calculated to describe the learning style of each university teaching faculty member based on the Kolb LSI instrument. Table 1 shows the four learning styles for all participants. Among the sample ( $n = 20$ ), 40% ( $f = 8$ ) of the respondents had an assimilating learning style, 35% ( $f = 7$ ) had an accommodating learning style, and 25% ( $f = 5$ ) had a converging learning style. It should be noted there were no diverging learning styles among the sample.

Table 1

*Teaching Faculty Members’ Preferred Learning Style (n = 20)*

Learning Style	<i>f</i>	%
Assimilating	8	40%
Accommodating	7	35%
Converging	5	25%

Diverging	0	0%
<b>Total</b>	20	100%

### Teaching Philosophy Statements

For objective two, qualitative data was collected and analyzed by coding based on each respondents' teaching philosophy statement. Objective two was to determine if personal learning style of university teaching faculty influenced their teaching philosophy statement. The following analysis specifies which of the four learning styles that each of participants' aligned with based on the aggregate number learning style identified according to their teaching philosophy statement. Respondents who may have had an equal number of learning styles identified within their teaching philosophy statement may be listed in more than one learning style. Respondents whose teaching philosophy equally identified with multiple learning styles may be listed as inconclusive.

**Accommodating.** An accommodating learning style was the most frequently identified learning style based off sampled teaching philosophy statements. Participants 1, 4, 6, 8, 9, 12, 13, 18, and 19 were identified as accommodators based off their teaching philosophy statement. These respondents discussed providing new experiences in the classroom by giving students hands on experiences. An overwhelming number of the respondents indicated that new experiences, either in or outside of the classroom, provided an active learning environment that was conducive to solving real-world issues. Respondents stated that the best way to "enable students" (Participant 13) to these new experiences were to "get their hands dirty," (Participant 12) and providing a "field oriented, hands-on" (Participant 4, 8, 18) approach in their lessons. Participant 8 went even further by sharing that they had found the best success in teaching by promoting a "learn by doing" (Participant 8) approach.

Many of these participants stated that they promoted learning through trial and error. Participant 9 went even further by stating that they encouraged their students to "think positive about failures but learn from mistakes" (Participant 9). Participant 1 shared that by providing this opportunity of failure to students, they believed that this created a "dynamic learning environment that challenges existing disciplinary boundaries" (Participant 1). Additionally, this participant shared that providing students the opportunity to experiment with new ideas, they found students were able to pursue their learning, "from a place of personal fulfillment."

**Diverging.** The second emerging learning style identified was a diverging learning style. Participants 1, 6, 9, 13, 14, and 18 were identified as divergent based off their teaching philosophy statement. These respondents discussed the value of incorporating creative and open-minded dialogue with students to promote effective instruction. Respondents stated that by allowing students to, "ask questions and explore [their] innate curiosity," (Participant 1) it has prompted students to be, "independent, creative [in] thought to develop research questions relevant to critical topics" (Participant 13). These two statements sum up the overall theme from the participants identified. Participant 6 summarized this teaching philosophy best by stating, "teaching is about student learning, and the development of creative teaching techniques." These statements can infer that respondents value innovation, imaginativeness, and original thought processes from students. Another overall theme shared by these respondents was their

willingness to incorporate students of diverse backgrounds into their teaching. Participant 6 stated, "I recognize that students enter the classroom at different developmental levels and from diverse backgrounds." Participant 13 also shared a similar experience by stating, "I have had the pleasure to work with students with varying economic and ethnic backgrounds in English, Spanish, and Portuguese during my academic career." Respondents reflected on their experience with students by sharing that, "learning their cultures and education paths" (Respondent 9), has lead these respondents "toward a life-long pursuit of knowledge" (Respondent 1).

**Assimilating.** The third emerging learning style from participants' teaching philosophy statement was assimilating. Participants 7, 14, 16, and 17 were identified as assimilators based off their teaching philosophy statement. These participants shared they valued to help learners through "critical thinking skills," (Respondent 7) and defining problems using inductive reasoning. This could easily be seen from participant 16, who shared "people learn very effectively when they are presenting their projects and findings and the critical feedback that is gotten from these activities stimulates the development of ideas." Participant 16 also stated they "will have students read literature and require them to write essays that demonstrate their knowledge on the subject but also on their ability to extrapolate from published experiments into designing new experiments that are the next steps in the field." From these statements, this respondent appreciated learners who were able to critically analyze research and use thought to help define new problems.

Many participants shared an impersonal approach to their teaching. Participant 7 shared they form a contract, "between the student and it binds us in this agreement for the duration of the course." This statement alludes to the notion the instructor uses a formal, business-like teaching style with each student. Respondent 14 shared their experience with working with students by stating, "it is the role of the student to actively pursue the learning of the body of knowledge." This approach to teaching alludes to idea that it is the student's responsibility to critically pursue their own learning, and that the engagement of the instructor is limited.

**Converging.** Another emerging theme was a converging learning style among some participants. While participants 7 and 17 showed a strong identification as an assimilator as previously mentioned, these participants were equally identified as convergent based on their teaching philosophy statement. This suggests these two instructors may be more fluid in their teaching philosophy. In one example, participant 7 mentioned their goal as an educator was, "to teach future agricultural leaders how to address the world's food and resource issues and to provide them with the skills they need to think critically about a problem." Since participant 7 mentions developing skills, they felt that students were able to, "solve problems" related to agricultural issues. When testing student knowledge about content, Participant 7 shared that it was crucial to "provide rigorous applications of the main concepts and themes taught throughout a section of the exam." For participant 7, it is important that the student can draw from various information sources to best solve a practical issue. As previously mentioned, this participant's daily engagement with students followed suit to an accommodator.

**Inconclusive.** A final theme identified was many respondents were determined as having an inconclusive learning style based off their sampled teaching philosophy statements. Participants 2, 3, 5, 10, 11, 15, and 20's teaching philosophies fell into this theme. Respondents in this group represented a wide variety of teaching philosophies that could not be connected to

any specific learning style. Inconclusive respondents work through all four phases of the learning cycle to provide flexibility in their teaching style. These respondents showed a willingness to adapt their teaching to be effective to a wide variety of diverse learning styles in their classroom.

These respondents showed a subsumed number of characteristics that could lead them towards an accommodating learning style based on their teaching philosophy statement. One respondent shared, "I envision myself working on international internship opportunities that will allow University of Florida students to explore and broaden their horizons, grow as professionals and apply- back at home- their experiences learned abroad" (Participant 3). Another respondent from this group shared a similar story when sharing, "I will certainly make sure the students are aware of any opportunities to engage in additional research or extension work outside the class" (Participant 5). A divergent learning style can be established from the inconclusive respondents based on their teaching philosophy statement. Their instructional goals were to build, "broader perspectives" (Participant 3) from students. Inconclusive respondents shared their teaching philosophy is to, "enhance the students' creativity" (Participant 5), "stimulate their energy and curiosity" (Participant 3), and promote, "inclusion of diverse thought and learning of personality styles" (Participant 11). These statements shared demonstrate respondents' teaching philosophies deemed as inconclusive value unique student perspectives in their classroom.

Inconclusive respondents incorporated several characteristics that could lead them towards an assimilating learning style based on their teaching philosophy statement. One respondent shared "my approach is to foster critical thinking, questioning, and engagement" (Participant 3). One respondent shared a similar view by sharing they stress the importance of, "effectively work in a group while developing strong arguments and critically evaluating scientific data" (Participant 15). Both respondents shared they value students' ability to use critical thought processes. Inconclusive respondents showed a subsumed number of characteristics that could lead them toward a converging learning style based on their teaching philosophy statement. Many inconclusive respondents shared their teaching should be both applicable and practical. These respondents shared students should, "connect all topics covered in class to solve a problem" (Participant 2), "have a broad working knowledge of society's most critical issues" (Participant 11), and understand that "learning extends beyond the classroom" (Participant 15). Many of these respondents shared utility of the lesson was an important aspect to their teaching.

### **Conclusions, Recommendations, and Implications**

The purpose of this study was to explore if a faculty members' preferred learning style is expressed in his or her teaching philosophy statement. Participants were identified as having a preferred learning style using the Kolb LSI. University faculty presented an array of learning styles based on their teaching philosophy statement. Many were ruled as inconclusive, since no learning style could be definitively identified.

The first objective was to determine the learning style for each university teaching faculty. As described in the findings, no participants were initially identified as diverging based on the Kolb LSI. Findings from university teaching faculty were ruled most faculty members as either assimilators or accommodators based on the Kolb LSI. This finding may support previous research from Lamm et al. (2011), suggesting that faculty members ruled as assimilators may be

more structured, logical, and methodical in their instruction. Additionally, those ruled as accommodators based on Kolb LSI may prefer being more engaged in lessons with students rather than through lecture (Lamm et al., 2011). These distinctions in learning styles suggest that the learning environment may play a role in their teaching practice, thus influencing their LSI score (Foster & Sankey, 2012).

The second objective was to determine if university teaching faculty members' personal learning style were expressed in their teaching philosophy statement. The findings from objective one are contradictory to many faculty members' teaching philosophy statement. Upon analysis of the findings from the teaching philosophy statement, several faculty members were identified as divergent. All teaching faculty that were found to be divergent based on their teaching philosophy statement were found to have also identified with another preferred learning style. Additionally, university teaching faculty who were ruled as inconclusive presented some leading characteristics of a divergent learning style. It can be concluded that while a diverging learning style may not be university faculty members' preferred learning style, instructors value divergent learning style characteristics in their classroom instruction. This finding supports characteristics of a well-written teaching philosophy statement outlined by Schonwetter et al. (2002), who stated that teaching methods and evaluation addressed in a teaching philosophy statement take into consideration the diversity of students. Teaching faculty appreciated the many perspectives that students could offer in the classroom, but recognized divergent learning as a secondary learning style in their classroom.

The findings revealed a large portion of university faculty were determined inconclusive based on their teaching philosophy statements. Schonwetter et al. (2002) explained that a well-written teaching philosophy statement addresses a wide variety of teacher and student interactions. Kolb (1984) stated that as teaching faculty address these various aspects of a teaching philosophy statement, they prefer to use the various aspects of the learning cycle. It can be concluded that university teaching faculty members deemed as inconclusive do not express their preferred learning style in their teaching philosophy. Additionally, this conclusion suggests that these faculty members may use teaching strategies that tailor to a number of learning styles. The numerous learning styles presented in inconclusive teaching philosophy statements suggest that teaching faculty adapt their instruction to a number of learning styles. Kolb (1984) suggested that learning occurs best when a person must move through all four stages of the learning cycle. Sankey and Foster (2012) explained that teaching faculty who addressed various learning styles in their teaching philosophy statement may demonstrate the fundamentals for excellent and effective teaching characteristics. Teaching faculty ruled inconclusive are not strongly influenced by their preferred learning style, thus these university faculty members may have strong teaching skills.

Several teaching faculty were identified as exhibiting two learning styles based on their teaching philosophy statement. With the exception of one respondent in this group, faculty members were identified as utilizing their preferred learning style identified from the LSI and at least one other learning style based on their teaching philosophy statement. Only one respondent was identified with two learning styles based on their teaching philosophy statement, in which neither matched their preferred learning style from Kolb LSI. University teaching faculty in this group gravitate towards their preferred learning style and another learning style. It can be concluded that some university faculty members may use their preferred learning style to guide

classroom instruction, but they also use a learning style that is adjacent to their preferred learning style based on Kolb's (1984) learning style inventory. Lamm et al. (2011) supports this conclusion, suggesting that teaching faculty in this group may vary instruction to complement their preferred learning style. This conclusion aligns with Kolb's (1984) learning style theory, which suggested learning styles are cyclical in nature. As a teaching faculty member moves through the learning cycle, they may have a tendency to reflect or act, or may prefer to feel or analyze during instruction.

University teaching faculty who were initially identified as having one learning style from the Kolb LSI were identified as having a completely different learning style based on their teaching philosophy statement. It can be concluded that some teaching faculty may be able to gravitate toward a learning style that may not be best for how they personally learn, but how they believe their students will learn the material best. This finding contradicts Schonwetter et al. (2002), who suggested a teaching philosophy is predisposed and rooted in the faculty members' own learning style. Conversely, two teaching faculty who were initially identified as having one preferred learning style were identified as having the same learning style in their teaching philosophy statement. This conclusion supports Schonwetter et al. (2002), suggesting that a persons' preferred learning style may indeed derive ones' teaching philosophy.

Based on these findings, instructors should implement an assortment of teaching methods that accommodate for many different learning styles in the classroom. Since a teaching philosophy guides what is occurring in the classroom, a teaching faculty member should incorporate multiple learning styles. If teaching philosophies are written to be more inclusive, then there is a stronger likelihood that instructors may use teaching practices that meet the needs of diverse learners. In addition to creating a learning environment that suits all learning styles to some degree, instructors should create meaningful learning experiences, which may be tailored to their preferred learning style. To make improvements in learners' engagement in the classroom, teaching faculty should consider utilizing teaching methods from all four learning style preferences to provide a deeper context for instructional material. By addressing all four learning styles, faculty teaching methods may help with knowledge transfer and developing competencies to enter the workforce successfully. Another recommendation is to develop a mentor program for new faculty to collaborate with experienced teaching faculty members in developing diverse teaching strategies that accommodate to all four learning styles. This mentor program may also be established for faculty members who do use all four learning styles well or those who are looking to improve their use of all four learning styles in the classroom. Finally, professional development workshops should be conducted to help faculty members recognize other teaching methods that align with learning styles outside of their own. Professional development workshops should guide teaching faculty in creating comprehensive teaching philosophy statements through continual revisions to their teaching philosophy.

One of the limitations of this study is the small sample size. This study used an exploratory research design, thus the findings of this study cannot be generalized to all teaching faculty. Nonetheless, future studies should observe if university faculty members' teaching philosophies accurately reflect how these instructors teach. Currently, limited research examines the relationship between faculty members' teaching philosophy and practical application in the classroom. Classroom observations may examine if teaching methods accurately reflect university teaching faculty members' preferred learning style. Moreover, future studies should

examine if instructors' preferred learning style is expressed in teaching philosophies of faculty members at other universities and in other fields of interest other than agriculture. Different missions, values, and content areas at various universities could impact the diversity of learning styles present in teaching philosophies. Demographics of faculty members could play a role in their preferred learning style. Future research should determine if demographics of teaching faculty members are predictors of one's preferred learning style. Furthermore, future studies should investigate how teaching methods that tailor to all four learning styles impacts the knowledge transfer and competency development for the workforce.

## References

- Andrews, J., Garrison, D. R., & Magnusson, K. (1996). The teaching and learning transaction in higher education: A study of excellent professors and their students. *Teaching in Higher Education, 1*, 81–103. doi: 10.1080/1356251960010107
- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education*. Belmont, CA : Wadsworth Cengage Learning, c2010.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: SAGE Publications, Inc.
- Dewey, J. (1938). *Education and experience*. New York, NY: Simon and Schuster.
- Edgar, D., Retallick, M., & Jones, D. Research priority 4: Meaningful Engagement Learning in All Environments. 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.
- Fitzmaurice, M., & Coughlan, J. (2007). Teaching Philosophy Statements: A Guide. In C.O'Farrell (Ed.), *Teaching portfolio practice in Ireland a handbook* (pp. 39–47). Dublin, Ireland: Centre for Academic Practice and Student Learning (CAPSL), Trinity College Dublin and All Ireland Society for Higher Education (AISHE).
- Georgetown University. (2014). *Recovery: Job growth and education requirements through 2020*. Retrieved from [cew.georgetown.edu/recovery2020](http://cew.georgetown.edu/recovery2020)
- Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing and experiential learning in higher education. *Academy of Management Learning & Education, 4*(2). 193 – 212. doi: 10.5465/AMLE.2005.17268566
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood, NJ: Prentice-Hall.
- Kolb, D. A. (2007). *The Kolb learning style inventory: LSI workbook*. Boston, MA: Hay Resources Direct.
- Lamm, A. J., Cannon, K. J., Roberts, T. G., Irani, T. A., Unruh Snyder, L. J., Brendemuhl, J., & Rodriguez, M. T. (2011). An exploration of reflection: Expression of learning style in an

- international experiential learning context. *Journal of Agricultural Education*, 52(3), 122-135. doi: 10.5032/jae.2011.03122
- Lombard, M., Snyder-Duch, J., & Bracken, C.C. (2002). Content analysis in mass communication assessment and reporting intercoder reliability. *Human Communication Research*, 28(4), 587-604. doi:10.1111/j.1468-2958.2002.tb00826.x
- Loo, R. (2004). Kolb's learning styles and learning preferences: Is there a linkage?. *Educational Psychology*, 24(1), 99-108. doi: 10.1080/0144341032000146476
- Rateau, R. J., Kaufman, E. K., & Cletzer, D. A. (2015). Innovative classroom strategies that prepare college graduates for workplace success. *Journal of Agricultural Education*, 56(3), 52-68. doi: 10.5032/jae.2015.03052
- Riffe, D., Lacy, S., & Fico, F. (2005). *Analyzing media messages: using quantitative content analysis in research*. Mahwah, NJ: Lawrence Erlbaum.
- Sankey, L. L., & Foster, D. D. (2012). A content analysis of teaching philosophy statements of award winning colleges of agriculture professors. *Journal of Agricultural Education*, 53(4), 124-140. doi: 10.5032/jae.2012.04124
- Schonwetter, D. J., Sokal, L., Friesen, M., & Taylor, K. L. (2002). Teaching philosophies reconsidered: A conceptual model for the development and evaluation of teaching philosophy statements. *The International Journal for Academic Development*, 7(1), 83-97. doi: 10.1080/13601440210156501
- Smith, K. L., & Rayfield, J. (2017). Student teaching changed me: A look at Kolb's Learning Style Inventory scores before and after the student teaching experience. *Journal of Agricultural Education*, 58(1), 102-117. doi: <https://doi.org/10.5032/jae.2017.01102>
- Tucker, R. (2008). Learning style drift: Correlation between built environment students' learning styles and the learning styles of their teachers. *Journal of Education in the Built Environment*, 3(1), 68-79. doi: <https://doi.org/10.11120/jebe.2008.03010068>

## **Discussant Remarks**

### **Exploring Learning Styles Expressed in Teaching Philosophies among Agricultural University Teaching Faculty**

Discussant: J. Shane Robinson, Oklahoma State University

#### **Overview/Context**

This convergent mixed methods study sought to explore if the preferred learning style of faculty members was included in their teaching philosophy statement. Thirty faculty members at the University of Florida enrolled in an 11-week course on teaching. Twenty agreed to participate in the study in which one of their eight assignments (developing a teaching philosophy statement) was used as a data collection tool. Findings revealed from the philosophy statements were compared to those derived from an instrument designed to assess the same variables according to Kolb's experiential learning model. Faculty were largely assimilators and accommodators based on Kolb's LSI; however, when interrogating the teaching philosophy statements, a plethora of learning styles were revealed, thus, leading to contradictory findings.

#### **Strengths**

- The study assesses an important topic in higher education. If teaching is to be valued and improved, faculty must begin and/or continue thinking deeply about the ways in which knowledge is packaged and delivered by the instructor and received, assembled, and retained by the learner. Assessing teaching philosophy statements is an effective measure for determining the importance faculty place on and the knowledge they have about teaching and learning. I applaud the authors for taking on a mixed methods design to determine the degree to which the preferred learning styles of various faculty members were expressed in their teaching philosophy statements.
- The first section of the paper included a strong case for the inclusion of Kolb's LSI. This conceptual approach was appropriate for the study. Further, I appreciated the way the authors used Kolb's model to connect and explain the major findings of the study in the Conclusions section.
- The Methods section was well written and articulated. The fact that 30 faculty members enrolled voluntarily for an 11-week course is an impressive accomplishment in and of itself.

#### **Questions for Consideration**

After reading the manuscript, a number of questions arose regarding the study.

- Who were these faculty members? I would appreciate knowing more about their educational training and backgrounds, years in the professoriate, appointment percentage breakdown, the disciplines they teach, class sizes instructed, and any other information that may be germane to providing a *prototype* of those who participated in the study.
- The majority of the first section was devoted to explaining Kolb's model. Although appropriate, I would have appreciated a deeper dive into the Introduction, especially as it

related to setting up the need for the study. For instance, how are teacher beliefs established, and how are they modified?

- The description of Kolb's Experiential Learning Model in the literature review was dense and text-heavy. The section could have been improved substantially by including the model as a figure. Why was the actual model not included? Please consider adding this model as a figure to future works.
- In the Conclusions section, the authors stated that, "faculty should consider utilizing teaching methods from all four learning style preferences" (p. 12). What are the methods that naturally fit within each dimension of Kolb's model? What might this look like during a 50-minute lesson on a given topic?
- Again, on page 12, the authors stated that, "Since a teaching philosophy guides what is occurring in the classroom, a teaching faculty member should incorporate multiple learning styles." To what extent should faculty modify their approach to teaching to accommodate students' multiple learning style preferences? Is it pertinent for faculty to teach to their strengths or even possible for them to attend to all learners and their preferences?
- What are the next steps of this work? How can these data be used to improve the teaching effectiveness of the faculty who participated (and those who did not) in the study?

### Summary

The authors should be commended for their in-depth assessment of faculty instructors' approaches and conceptualizations of teaching. I appreciated the attempt the authors made at assessing the teaching philosophy statements of various faculty members and then triangulating the findings with quantitative data derived from a validated instrument designed to assess learning style preferences based on Kolb's model. As a person who is tasked with assisting faculty improve their teaching, I believe encouraging them to consider what they believe about teaching is an important first step to making adjustments and improvements in their delivery of lessons. To that end, interrogating teaching philosophy statements is appropriate means for collecting data. Regarding the major findings of the paper, perhaps these faculty "don't know what they don't know" about teaching. Or, perhaps, there was a recency effect of being in class, learning about a particular aspect related to teaching and learning, and then including it in their philosophy statements without fully understanding it or allowing it to permeate and result in change. Finally, perhaps the reason for the incongruent findings is due to faculty misconceptions about who they are and what they do as teachers, as "perception is in the eye of the beholder." For these reasons and more, helping faculty improve their teaching effectiveness is an imperative and worthy task.

# The Rookie: Describing A Researcher's First Semester Teaching in a University Classroom

Emma K. Winterhalter, Mississippi State University  
Carley C. Morrison, Mississippi State University  
Jesse I. Morrison, Mississippi State University

## Abstract

*Oftentimes research faculty find themselves teaching classes with little to no knowledge of effective teaching methods. As faculty in the agricultural education discipline, we are uniquely positioned to provide support and training to increase the self-efficacy of faculty members in this position. The purpose of this phenomenological study was to describe the teaching experience for an instructor with a research appointment and no formal teacher training. The instructor and students kept weekly journals reflecting on their teaching and learning experiences during class. After analyzing the instructor's journal individually, we met as a team and agreed on four common themes. Those themes were then compared with the students' journals to provide a well-rounded view of the class experience. The themes identified included confidence in teaching ability and knowledge of topic, dedicated to providing a quality learning experience, planning and time commitment, and building rapport with students.*

## Introduction and Literature Review

Most universities, especially land-grant institutions, place emphasis on the importance of teaching, research, and service. Some faculty and staff are excellent teachers and researchers, while others are better at one component than the other (Figlio & Schapiro, 2017). For faculty and staff with majority research appointments and no formal teacher training, the task of managing a classroom full of college students can be daunting and overwhelming (Postareff & Lindblom-Ylänne, 2006; Ramsden, 2003).

While research and education can have a complicated relationship, there is one root issue - how can we help teachers teach to the best of their ability so that students can learn to the best of theirs? (Rowland, Byron, Furedi, Padfield & Smyth, 1998). An informal twitter poll conducted by Polk (2007) reports that just 19% of the 2,248 teachers who responded had received at best *decent* training. Alsop (2018) suggests that teaching has been, and continues to be, undervalued. She highlights that while teaching is hard, it can be learned through practice and constructive criticism. Teaching is teachable, yet universities continue to hire researchers to teach without properly training them to do so (Alsop, 2018).

Gibbs & Coffey (2000) studied university teachers and students before and after the teachers participated in teacher training. They measured success by the teacher's improved skills, their development of concepts in learning, and change in student's learning. The researchers concluded that one year later, teachers with training were more student focused (Gibbs & Coffey, 2000). This is described as the teacher being first and foremost concerned with supporting the student so they deeply understand concepts, gaining lasting knowledge (Rowland, et al., 1998). Moreover, teachers with a student focused teaching style tend to have a higher self-efficacy (Gordon, Petocz, & Reid, 2007; Postareff & Lindblom-Ylänne, 2011).

Teaching style can oftentimes be linked to the teacher's confidence level, or self-efficacy (Sadler, 2009). Some researchers are never given the chance to hone these teaching skills, while some lack the desire (Curran-Everett, 1999). The teachers in Gibbs and Coffey's (2000) study who did not acquire training experienced negative effects as time went by, ultimately becoming more teacher focused, concerned primarily with themselves, their presentation of material, the testing content, and their own behavior in the classroom. This research leads us to believe that without the support of training, teachers may unknowingly adopt a teaching style that harms their student's learning (Estes, 2004). Therefore, providing formal training to non-formal teachers can allow both teacher and the students to be their best (Kini & Podolsky, 2016).

### **Can students learn from researchers who have not been formally trained to teach?**

Studies have shown that learning from a faculty member with research experience in their field has the potential to motivate undergraduate students at a higher level (Breen, Brew, Jenkins, & Lindsay, 2003). Researchers are trained to analyze their own work, as well as allow others to scrutinize their projects (Curran-Everett, 1999). This skill, objectivity, and depth of thinking is often passed down from teacher to student (Byrley et al., 2007). This classroom relationship can foster a closer bond between a student and their program of study, increasing the student's motivation to learn (Byrley et al., 2007).

Ramsden & Moses (1992) stated, "good research cannot be planned for; the insights gained from the teaching of undergraduate students may provide fresh stimuli for academic inquiry" (p. 274). A research-focused faculty member may overlook the needs of their students in order to conduct research (Ramsden, 2006). Jenkins, Blackman, Lindsay, and Patton-Saltzburg (1998) interviewed students who reported that professors who also conducted research were often times hard to get in contact with due to their research obligations.

Moreover, faculty without formal training are often unfamiliar with pedagogy and/or andragogy, which can result in a one-dimensional classroom (Curran-Everett, 1999). Pedagogical knowledge such as teaching methods, classroom management, curriculum planning, and the ability to diagnose students' learning needs all influence teacher performance (Darling-Hammond, 2000). Faculty who are new to the classroom may know how they are comfortable teaching, but are uncomfortable differentiating their instruction to meet their students' needs (Berliner, 1988).

### **What hinders researchers from being effective teachers?**

Many of the issues hindering faculty doubling as researchers and teachers stem from two things: their environment (Merkt, 2017) and/or a crisis of identity (Brownell & Tanner, 2012). If one's environment is supportive, collaborative, and communicates the standard researchers should be held to, the faculty are more likely to invest in the process it takes to balance both researching and teaching well (Borg, 2006). The second issue, an identity crisis, is simply human nature. How a person views their own self-efficacy and their professional standing may affect their willingness to change or learn new skills (Sadler, 2009).

It has been reported that teachers experience anxiety when asked to teach content they do not feel their expertise fully encompasses (Sadler, 2009). This occurs often because both teachers

and researchers are consistently asked to teach courses that cover a multitude of concepts or techniques (Lang, 2012). Confidence in one's skill and knowledge play a vital role in the effectiveness of teaching (Sadler, 2009). However, ambiguity in expectations of an effective teacher may further increase anxiety in the classroom. Providing support and a criteria of teaching expectations has the potential to increase the confidence of those faculty who are new to the classroom (Graham, 2015).

### **What perpetuates this cycle?**

While research shows that teaching requires a high level of intelligence and skill, it has been reported that teaching is often times not rewarded in the same way research is within academia (Alsop, 2018). A common observation is that teachers are not compensated as much financially, as well as less respected when compared to researchers (Brownell & Tanner, 2012). A lack of respect reflects the need to have one's personal identity fed. A study conducted by Connolly (2010), observed that doctoral students in higher scientific education had a distinct fear of publicly recognizing their desire to teach. Connolly (2010) states

Many interviewees were dismayed by messages that being a good researcher is incompatible with being a good teacher, either because there is not enough time for pedagogical training (and, after all, it can be easily learned on the job) or because an obvious interest in teaching is a sign of a failed researcher. (p. 1)

Students are afraid to admit their interest in teaching, leading to them never receive any training in this area. This need for peer approval breeds inequality amongst researchers and teachers (Brownell & Tanner, 2009).

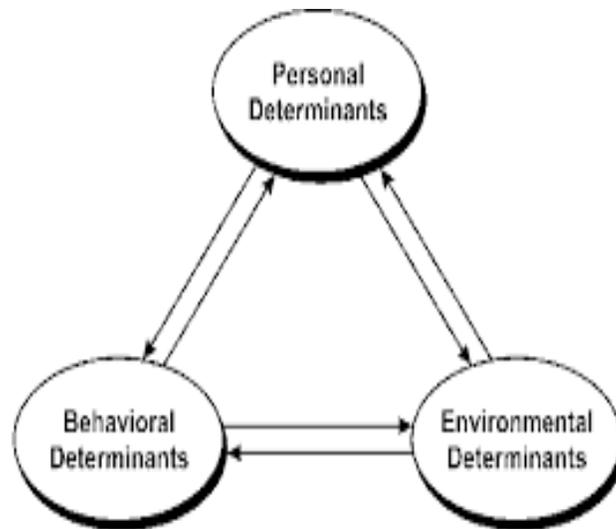
The belief that research output is favored over teaching effectiveness is perpetuated by the promotions, tenure, and acknowledgment faculty receive (Prince, Felder, & Brent, 2007). In reference to his personal experience with departmental tenure expectations, Cahn (2002) reported "if you have great publications but lousy teaching, you'll still get tenure. If you have great teaching but not-so-great publications, you won't get tenure" (para. 5). This expectation is true for many research 1 institutions, instead of resolving the tenure dilemma of what to prioritize; universities are stuck in their reward systems (Nicholls, 2001). This can often discourage researchers from entering the classroom for fear of not succeeding in academia (Carroll, 2011).

### **Conceptual Framework**

Self-efficacy is the belief in one's ability to perform certain events successfully - it is someone's confidence in their actions (Bandura, 1998). This concept has the power to influence the choices a person makes, their goals, and their vulnerability to negative emotions and stress (Bandura, 1998). In terms of teaching, self-efficacy refers the instructor's perceived ability to successfully teach a concept to their students (Tschaannen-Moran, Woolfolk-Hoy, & Hoy, 1998).

Bandura (1998) proposes that mastery and vicarious experiences play large roles in self-efficacy. Mastery experiences are hands-on, personal experiences that build confidence while honing a certain skill (Bandura, 1998). In contrast, vicarious experiences are gained through observation (Bandura, 1998). University faculty who are teaching with no formal training often lack these experiences, potentially lowering their self-efficacy in the classroom (Sadler, 2009).

Additionally, Social Cognitive Theory, illustrated in Figure 1, is at the foundation of self-efficacy (Bandura, 2001). This theory demonstrates the relationship between one's work relationships, behaviors, and environment (Bandura, 2001). Each component is interdependent, if one element is suffering or lacking, it could manifest itself in the other areas (Bandura, 1986). A healthy support system, safe environment, and developed self-efficacy are needed if an instructor is to succeed in the classroom (Bandura, 1986).



*Figure 1.* Social cognitive theory (Bandura, 1986).

The purpose of this phenomenological study was to describe the self-efficacy of an instructor with no formal teacher-training who taught a split-level plant and soil science course in The College of Agriculture and Life Sciences at Mississippi State University for the first time during the Spring 2018 semester. In addition, student perceptions of the learning experience were also examined in an effort to holistically describe the teaching and learning environment. The following research objective guided this study:

1. Describe the phenomenon of the classroom teaching experience for an instructor with no formal teacher training over the course of one semester.

## **Methods**

This study was qualitative in nature, utilizing phenomenological research methods (Creswell, 1998). This research design was selected to describe the phenomena of the teaching and learning experience for a first-time instructor, with no formal teacher training, in a split-level plant and soil science course in College of Agriculture and Life Sciences at Mississippi State University (Fraekel, Wallen, & Hyun, 2015). Moustakas (1994) outlines a three-step process for conducting a phenomenological study: (a) identify a phenomenon to study; (b) bracket out the assumptions and biases of the researchers; and (c) collect data from individuals who have participated in the identified phenomenon.

## Bracketing

Gearing (2004) states that bracketing is a “scientific process in which a researcher suspends or holds in abeyance his or her presuppositions, biases, assumptions, theories, or previous experiences to see and describe the phenomenon” (p. 1430). The research team consisted of the course instructor, a university teaching faculty member, and an undergraduate student researcher who was not enrolled in the plant and soil science course. We attempted to bracket out our own previous teaching and learning experiences that may have influenced our analysis of the data. Additionally, during data analysis, we analyzed the data individually then met as a team to agree on common themes from the journal entries (Fraenkel, Wallen, & Hyun, 2015).

## Data Collection

Both the instructor of the course and the students ( $N = 30$ ) kept a weekly reflective journal. The reflective journals provided an opportunity for the students to think about what they had learned, how they had learned it, and what questions they still had after the learning experience. For the instructor, reflective journaling “provided a way to capture details of their teaching directly after class, and read an ongoing narrative of their teaching across terms” (Reflective Teaching, 2018, para. 3).

During the Spring 2018 semester, Grain Crops consisted of a one-hour lecture, Monday and Wednesday from 10-10:50 am followed by a lab each Wednesday from 12-2:50 pm. The instructor asked the students to journal for 15-20 minutes at the beginning of lab each week. The students responded to the following prompt each week:

What to address in each weekly reflection -

- Begin with the date and topics covered this week
- Explain your overall interest in the topic from this week. Did you feel engaged during class or did you find yourself losing interest? What was it about class that made you feel that way (content, [instructor's] teaching style, etc.). Please explain your answer with specific examples from lecture or lab.
- What specifically would you change about class this week? (Nothing is not acceptable here)
- What questions do you have about this week’s topic that you haven’t gotten the chance to ask [instructor] (After answering this question take the opportunity to schedule a meeting for clarification).
- What additional comments (good and/or constructive criticism) do you have for [instructor] regarding class this week in order for them to improve future semesters of Grain Crops?

The students kept their weekly journal entries in composition books. The students were assigned random numbers that matched a number on each composition book in an effort to protect the student’s identities, and encourage honest feedback. To promote quality journaling time, the course instructor reflected on their teaching while the students completed their journaling assignments each week. The instructors journal entries were less structured and focused on their own perceptions of self-efficacy throughout the course of the semester. A total of ten weekly reflective journal entries were logged from both the instructor and students.

## Data Analysis

Moustakas' (1994) phenomenological method of data analysis was used to analyze the students' and instructor's journals. The process included three steps: (a) a complete read-through of all journal entries; (b) the identification of preliminary themes, then clarified by the phenomena in question; and (c) then applying the identified themes to the research objectives of this study. We analyzed the instructor's journal entries, individually, then met as a group and agreed on four common themes expressed by the instructor (Fraenkel, et al., 2015).

Additionally, we compared the identified themes to the student journal entries for a complete description of the learning experience over the course of the semester. A coding system was developed for reporting the results of this study. Instructor data were coded as "I" followed by the week in which the data was entered into their journal, EX: (I, W1-10). Student data were coded as "S" followed by the unique number assigned to their journal, and the week in which the data was entered into their journal, EX: (S1-25, W1-10).

## Results

The results of the study are described as themes identified by the research team. However, commentary regarding those themes is provided from the instructor's point-of-view. This method was used in an effort to provide the most descriptive and real account of the phenomena (Finlay, 2012). In addition, excerpts from both the instructor's and the students' journals are included to provide thick, rich descriptions of the experience, and guide the instructors' commentary. This method increases trustworthiness of study findings, reduces biases in reporting of results (Finlay, 2012), and allows the reader to feel as though they participated in the experience (Creswell & Miller, 2000).

### Confidence in teaching ability and knowledge of topic

I was approached about teaching this class when the regular instructor was promoted to an administrative position and, so far, nobody had volunteered to take the class. During graduate school, I had mentioned to my major professor on several occasions that I was interested in teaching if I ever had an opportunity to. I was working as a full-time researcher for my major professor when he offered me the opportunity to teach the class. He knew I would accept, so he preemptively warned me about the time investment it would require. At that point I had been a Teaching Assistant in a couple plant science courses and had covered several class meetings for my major professor when he was traveling, etc. I had gotten feedback from my major professor on occasion, which was usually positive, but I was always teaching subjects in a class that I had taken with him, so I knew how he would want it to be taught. While grain crop production was not my specific area of expertise, I *was* still an agronomist, and I felt confident in my ability to brush up on current production strategies and practices, summarize the important information, and develop engaging lectures on relevant topics. Basically, I knew that I had an earned degree in agronomy and over a decade of experience in agronomic crop research... if that wasn't enough to prepare me to teach people about how plants grow, then what was?

I began this semester by taking about two weeks to prepare to teach. I was gifted several PowerPoints and handouts from the previous instructor, and figured that it would take very little

time to familiarize myself with the material. I really thought that getting that course material was the solution to my semester. I was cautiously optimistic about classes starting... I wasn't really concerned about how the semester was going to go in the classroom, I figured it would be fine. I was more concerned with how I was going to balance my new teaching obligation and my already established research obligations.

However, to my surprise, "I felt really spaced out on the first day of class...maybe too much coffee. Maybe nerves. Maybe all of it." (I, W1) For me, my lecture on the first day of class felt like the first time I made a public speech. I wasn't sure how it was going the whole time, and when I finished, nobody said a word... no questions, no comments. I wasn't sure if that was a good or a bad thing, but I was pretty certain it wasn't what I was shooting for. In my head, I had pictured students constantly raising their hand, asking questions, starting conversations about interesting topics, laughing and enjoying the class. I figured at worst, maybe some of the undergrads would zone out but I would keep the graduate students in the class interested in the science behind grain crop production... but I was wrong there, too.

It seemed like early on in the semester "some of the students [were] cautious to accept what [I was] saying as truth or fact. I guess I was too at that point" (I, W3). However, after reading through their journals several of them stated that they were "interested in what [I was] teaching" (S19, W1), and that I was "well prepared" (S29, W1), "knowledgeable" (S28, W1), and "doing a great job" (S7, W2). One student even reported they enjoyed my teaching style and use of examples (S13, W2). But apparently that positive affirmation was short lived...

*"I felt engaged but I didn't like this week's stuff as much as other stuff we learned in the past. If I could change something about this week it would be for him to not bash Trump." (S18, W9)*

Ouch! It became clear to me pretty soon that because my education and research specialty is not specifically in grain crop production (I work mostly with forage species breeding and the plant/animal interface) and because I admitted that openly to the class on several occasions, that it became difficult to get them to accept the things I was teaching as the gospel. They didn't become argumentative or standoffish, they just became cautious about my credibility and, on occasion, didn't want to hear some of the things I was saying. This became even more complicated when we started to bring international relations, global trade, politics and economics into the lecture and try to tie them to the agricultural industry. There is still a very romantic veil held over the farmer and the farming lifestyle, and challenging that started to put me at odds with my students.

Around that same time "[I was feeling] absolutely drained. Maybe because the subjects [were] starting to get out of my knowledge base" (I, W9). At one point, I was spending more time during the week studying and preparing for my lectures and lab than I was spending on my full-time job as a researcher. After my Research Team Meeting first thing Monday morning, I spent the rest of the week like this: Teaching Monday morning, spending the rest of Monday and the majority of Tuesday preparing lecture and lab for Wednesday. Lecture and conduct lab on Wednesday. Spend Thursday and most of Friday preparing for lecture the next Monday. I was barely learning the concepts and making the PowerPoint presentations in time enough to deliver them. All the while, we were working deeper into the production side of grain crop agriculture

and I had students really, really getting nerdy about what we were talking about. By this time in the semester, I was also bringing in guest lecturers to cover specific topics that were too far out of my comfort zone. I felt like I was just treading water, trying to survive until summer.

### **Dedicated to providing a quality learning experience**

*“This is the first week of class and I’m doing my best to be the kind of teacher I would like to have.” (I, W1)*

All I really wanted to do was provide my students with a meaningful, informative, worthwhile class. I was less concerned about how entertaining they thought I was or how many of them fell asleep during lecture, I just wanted them to be able to look back on the class and honestly say it was helpful and worth their time. I thought about some of the best teachers I had learned from in the past, thinking I would emulate them and their style. But I felt convinced that if I started trying to teach in a way that wasn’t natural to me, that it would come across as fake and insincere.

*“Truth be told, I feel like I can only teach one way...the way I know how to. That’s a [crappy] way to look at it, but sometimes I feel that way.” (I, W3)*

So, I stuck with the idea that all I could do was learn the material as best I could and put together the most passionate, energetic lecture I could and let that be it. In the end, at least they couldn’t say I didn’t try. After reading the students’ journals I guess that worked, at least they wrote that weren’t the “least bit bored” (S1, W4) with my lectures and they picked up on my passion for the content (S19, W3). But, then again, they may have just been trying to make me feel good again.

Week six was a turning point for me,

I thought Monday was an awesome lecture. And I think it made the students really consider the broader world of [class] importance to people, politicians, and how everything is connected...how a single change in government policy can drastically affect ag in the US and in [state] (I, W6).

I felt like if I wanted the students to look back on this class one day and really find it useful, that I needed to teach about more than just how to grow grain crops for production agriculture. I wanted to give them a more well-rounded look at the business, politics and international importance placed on grain crops and the real power they command on a global scale.

*“Trying to take away some information I could use with production. Was pretty engaged with what was going on I felt like. When we discuss things in class I feel like [Instructor] picks very strange things to focus on. We need more info on...things we can take home and use farming. Not the university typical ‘theories’ we get.” (S12, W6)*

I figured that the majority of students in the class were from the Mississippi Delta, and most of those had never left the region. It became clear later on that at least a few of the students weren’t impressed with the learning experience that they had received from my well-rounded lesson plan. Some of them were more interested in learning technical information to help them plant, cultivate, and harvest more productive grain crops. In hindsight I feel like that’s more along the

lines of what was traditionally expected in the class, and I likely disappointed a few students by not focusing more in that direction.

Although the lecture I prepared for week six didn't necessarily go over like I had planned, the hour in between lecture and lab ended up making my day. "I stayed in the classroom...between class and lab. I got to have a great conversation with a few students while [working] through a calculation problem. Then as the students returned to class, we began discussing [topics]...it was awesome. these students [were] great" (I, W6). The calculation problem we were working on had been a homework assignment which was due to be turned in at the beginning of lab. The students that stayed in the classroom between lecture and lab were mostly working together on this homework assignment that was due in an hour. I was sitting in the front of the room reading, when one of the asked me to explain the variables in the equations we were using. The variable were simple agronomic numbers... yield, area, grain moisture, row spacing, etc., but it took me drawing the whole thing on the board for most of them to understand how those equations worked the way they did. As students came trickling back into the classroom after lunch, they started asking other students if they had finished their homework... then the students who had been in there during lunch started teaching the ones who were just arriving. It was like magic. At that moment, I wanted to be invisible, just to see what they would keep doing.

While I had planned to attempt to teach to all of the students (from the hardcore ag kids who knew more about grain production than I did, all the way down to the students who had zero interest in agriculture, they just needed a lab science credit), it was evident that student expectations were also individual. Even though my students seemed to be unimpressed with my well-rounded lesson in week six, I tried it again three weeks later, after watching a news anchor talk about grain crops and openly admit their ignorance on the subject. I wanted my students to realize how far removed our society is from production agriculture and the implications that can have for our industry. So, we watched that clip in class the next day and I planned a discussion-based activity for my students. I felt like I was standing up in front of the class that day watching my students with one eye closed bracing for the impacts of my actions. I was relieved when we all survived that day, and to my surprise, maybe it worked - "today we watched a short clip...[that] talked about how sorghum would impact American agriculture. I feel that it is important to know about what is going on in today's world and be aware of how it could impact us. Not many teachers will show you these things but I think it should be in every class" (S4, W9). Maybe I am doing OK after all.

### **Planning and time commitment**

Early on in the semester, it was very difficult to gauge how well the students were picking up the information I was giving them in lecture. Maybe that's just a comfort level thing, but they were saying absolutely zero in class. Because I was getting minimal feedback from them, I was "taking too long to cover the material", and all of a sudden, we were a whole week behind schedule... after only two weeks in class (I, W2). A WEEK BEHIND. This made me really have to establish lecture schedules and stick to them. No matter what.

*“I had an off-day on Monday, nothing seemed to come out like I planned...but I got the lesson out, and nobody fell asleep, so I consider that a success, I guess.” (I, W3)*

It also became very clear that I needed to spend more time preparing for lecture, mostly just learning the technical aspects of the production practices I was lecturing about, so I could give more context and background information about why we farm the way we farm. But also, I just needed some plain old practice giving my presentation. Or, should I say teaching my lesson? Since I really didn't have any kind of measuring stick to assess my confidence and success in the classroom, I gauged my effectiveness by counting the number of people sleeping during class.

There were times when, even though I felt like I had prepared myself well for class, the “lesson was boring...that's saying something. Maybe it's because grain crops are still kind of foreign...or maybe I didn't prepare enough.” (I, W8) I wasn't making a very interesting, engaging lecture happen. When I couldn't come up with a good reason for the dull lecture, I would inevitably go back to my amount of preparation and the quality of my teaching ability as likely culprits for the boredom. Maybe every teacher has those times, where they feel like they're not reaching a single person in the room. That feeling stinks, but it's worse when you feel like you're seeing the students try to get into it... they're not giving up, they're still there trying to learn, and you just can't seem to make anything stick. To make things worse, by week nine, “I [felt] absolutely drained. Maybe because the subjects [were] starting to get out of my knowledge base...which have required a lot of prep and study for me” (I, W9).

In addition to the about of time and preparation it took for me to even feel like I could stumble through lecture and lab, it took me even longer to figure out how to assess my students' learning. I knew I wanted to challenge my students past the point of multiple-choice question and answers... I wanted to see their brains working, but I didn't know what to ask or how to ask them. I also had no concept for what was an appropriate test length for the amount time they had to complete it. So, I gave it my best shot, “but apparently I made it a little easy” because they were in and out in no time (I, W4). Or so I thought...

*“I'd ask him to ease up on the difficulty of his tests.” (S1, W5)*

*“The tests are extremely unfair, asked questions we didn't cover and just very vague topics. He doesn't explain things well and we need [the previous instructor] to teach this class...[Instructor] has NO... experience and covers topics from freshman level [classes]. Very disappointed in this class.” (S12, W5)*

Double ouch!

### **Building rapport with students**

*“I just hope these kids know that I want them to succeed out there, and make a positive difference. Maybe.” (I, W3)*

Early on in the semester, I think there was a difficult hurdle to get over for a lot of the students. I think they were disappointed in my lack of experience with the grain crop species we

were talking about in class. I was open about the situation, which didn't ease their disappointment, but I think it helped them build some respect for my dedication and passion as the semester continued. Some of the students never made it over that first hurdle. Some of them never could look past that I didn't have a lot of practical experience around the crops we were studying. Maybe that hurdle kept some of them from asking more questions in class or participating more in discussions, but I think by the end of the semester I had more students respect me for dedicating myself to teaching Grain Crops than those that still couldn't see past my lack of experience.

*"He connects, doesn't act like a teacher in a good way." (S27, W1)*

I really did take this new teaching responsibility seriously, if I didn't want to teach I wouldn't have agreed to do it in the first place. I knew I would have good and bad days, I guess I was just hopeful there would be more good than bad. And for the most part there were. By the second part of the semester

I [had] a really good relationship with the students, and they [responded] pretty well to lecture, so I hope my situation [as a new instructor didn't throw] them off or [make] them check out. I [got] lots of questions from my students, which might mean [they were] interested, or they might just like it when I [went] off on a tangent (I, W9).

Ultimately, I work at a public university, full of students, and I wanted to connect with them and make a positive impact on their college experience. I knew I wouldn't connect with all of them, but I'm hopeful that I might have gotten through to a few of them. And for that I am proud.

Now that it's all over, I'm sincerely glad that I took advantage of the opportunity to teach that class. Who knows if I'll ever get a chance to do it again... but I'm glad that I got to have the experience. I find myself being proud of my students. I mean PROUD. I'm proud to see my students around campus and be able to refer to them in conversation as "one of mine". Out of the 29 students in that class, I could still tell you all of their names, and could probably tell you where they're from. That feeling, in a sense, makes all of the struggle and work that I put in to that semester worth it. I can't act like I did all of this out of the kindness of my heart. I received a stipend to teach that class. It amounted to 5% of my existing salary. When you really break it down, I figure that class increased my workload by 70%.

I am still unsure whether teaching this class will become much of a professional feather in my cap. In conversations I have had with other faculty, they applaud me for taking on the challenge for two reasons; it was a subject far outside of my specialty, and it was my first time teaching a class solo. I'm sure if I get the opportunity to teach the same class in the future, the amount of time I would have to invest would decrease, and my level of comfort with the material would increase. I assume that means that the students' experience would also improve... but who knows. Throughout the semester, the biggest insecurity I had came from feeling out of touch with the current state of grain crop production in the United States. Like I said, I work in forages. So, I was never sure what the most important topic to talk about would be. Of course, it would have been nice for someone to give me all the answers... but isn't it me that's supposed to be able to find the answers?

## Conclusions and Recommendations

The purpose of this study was to describe the phenomena that occurs when an instructor with no teaching experience is tasked with teaching a class for the first time. We examined one teacher, in one classroom, over the course of one semester, so the findings of this study should not be generalized to a larger population. It is our hope, however, that this study will prompt other researchers and educators to take a closer look at how we can help teachers teach to the best of their ability so that students can learn to the best of theirs (Rowland, et al., 1998).

Formal teacher training offers practical approaches that enable an educator to better manage a classroom, write curriculum, and understand students' individual needs (Darling-Hammond, 2000). The instructor in this study addressed all three of these skills, or lack thereof, as a source of anxiety. As the instructor stated, he felt capable teaching in only one way: the way he knew how to. Though this was not intended, some students may have struggled due to the fact they did not learn in the one way the instructor knew how to teach, which can be seen in the student's journals. If the instructor had participated in pedagogical/andragogical training prior to actually teaching the course, he may have been more confident differentiating the instruction to meet the learning needs of his students (Estes, 2004).

When describing how balancing teaching and research was going, the instructor said he was just treading water and trying to survive, and spent the majority of his time preparing to teach while also having to continue his research. Both research and teaching are demanding, intense professions, it is no surprise that balancing the two became a little overwhelming ultimately forcing him to decide on what he was going to focus on (Ramsden, 2006). However, contrary to Figlio and Schapiro's (2017) claims that oftentimes teaching takes a backseat to the instructors already established research agenda, the instructor made time to stay in the classroom in between class and lab in order to answer questions, as well as make an intentional effort to gauge his students understanding of the material. He also reports that he estimates teaching added 70% to his workload while only being compensated 5% of his salary. However, he mentioned multiple times in his journals his desire to positively impact his students, and for the most part, his students responded positively to his efforts in their journals as well.

Whether directly or indirectly, the instructor mentioned his perceived self-efficacy, in almost every journal entry. Sadler (2013) correlates a high self-efficacy to greater success for a teacher in the classroom. Moreover, the relationship between one's work relationships, behaviors, and environment all contribute to a positive meaningful experience (Bandura, 2001). Although he reported that the faculty in his department applauding him for his willingness to teach the course, he learned much about himself and his professional identity during his time in the classroom, and was genuinely proud of his students at the end of the semester, his perceived self-efficacy could have influenced his overall feeling of success in the classroom. After all, he ended the semester unsure if teaching would become much of a professional feather in his cap.

A number of recommendations for practice and future research can be made based on the findings of this study. As trained agricultural educators we can take for granted the time, effort, and methodology that goes into effective teaching. Students who are pursuing non-teaching graduate degrees with goals of entering into academia should explore adding a teaching minor to

their program of study. At the very least, graduate students should be encouraged to enroll in teaching methods courses and pursue opportunities to practice their teaching in the classroom setting.

Additionally, it is recommended that support and training be provided for existing faculty who are teaching with no prior experience in an effort to increase their self-efficacy in the classroom. This is a prime opportunity for faculty in agricultural education to collaborate with other departments, cross-college and university, to provide support, programming, and training on effective teaching methods and measures of success in the classroom. This collaboration will not only begin to bridge the teaching gap between hard sciences and human sciences, but also provides an opportunity for future partnerships across disciplines in research and service.

Moreover, those faculty who are teaching, on top of managing their full-time research programs, should be adequately compensated for their time. There is no doubt that research is an important pillar of the land-grant institution, but it is only one component of the mission. After all, what is a university without students? Teaching should be encouraged and celebrated, not avoided, by faculty. Expectations for promotion and tenure with regards to teaching, research, and service should be clearly communicated to all faculty, and an effort should be made to not favor one component over the other when evaluating success in the profession.

Finally, because this study only described one instructor's point-of-view it is recommended that studies similar to this one be conducted to better understand the phenomena of the classroom teaching experience for instructors with no formal teacher training. Additionally, research is needed to determine the unique professional development needs of those research faculty who are tasked with teaching.

### References

- Alsop, E. (2018, February 11). Who's Teaching the Teachers? [Blog post]. Retrieved from <https://www.chronicle.com/article/Who-s-Teaching-the-Teachers-/242488>
- Ashton, P. T., & Webb, R. B. (1986). Making a difference: Teachers' sense of efficacy and student achievement. New York: Longman
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual review of psychology*, 52(1), 1-26.
- Bandura, A. (1998). Personal and collective efficacy in human adaptation and change. *Advances in psychological science*, 1, 51-71.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44(9), 1175.
- Berliner, D. (1988). The Development of Expertise in Pedagogy. *American Association of Colleges for Teacher Education*

- Borg, S. (2006). Conditions for Teacher Research. *English Teaching Forum*, 44(4), 22–27.  
Retrieved from  
<http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=eric&AN=EJ1107899&site=eds-live&custid=magn1307>
- Breen, R., Brew, A., Jenkins, A., & Lindsay, R. (2003). *Reshaping Teaching in Higher Education: A Guide to Linking Teaching with Research*. Routledge.
- Brownell, S. E., & Tanner, K. D. (2012). Barriers to faculty pedagogical change: lack of training, time, incentives, and... tensions with professional identity? *CBE—Life Sciences Education*, 11(4), 339-346.
- Byrley, A., Chang, M. J., Chopp, R., Fix, S. E., Jaquette, J.S., Kah, G. D....Wheatley, S., (2007). *Student learning and faculty research: Connecting teaching and scholarship* [White paper]. from American Council of Learned Societies:  
[http://cpr.indiana.edu/uploads/ACLS%20teagle5\\_SSB4.pdf](http://cpr.indiana.edu/uploads/ACLS%20teagle5_SSB4.pdf)
- Cahn, P. (2002, March 4). Teaching Versus Research. [Blog post]. Retrieved from  
<https://www.chronicle.com/article/Teaching-Versus-Research/45969>
- Carrol, S., (2011, March 30). How to Get Tenure at a Major Research University. [Blog post]. Retrieved from <http://blogs.discovermagazine.com/cosmicvariance/2011/03/30/how-to-get-tenure-at-a-major-research-university/#.W60kUy-ZPm0>
- Connolly, M. (2010). Helping future faculty come out as teachers. *Essays on Teaching Excellence: Toward the Best in the Academy*, 22(6).
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice*, 39(3), 124-130.
- Curran-Everett, D. (1999, November 12). Learning How to Teach: How to Do It and Why You Want To. [Blog post]. Retrieved from  
<https://www.sciencemag.org/careers/1999/11/learning-how-teach-how-do-it-and-why-you-want>
- Darling-Hammond, L. (2000). How teacher education matters. *Journal of Teacher Education*, 51(3), 166-173.
- Estes, C. A. (2004). Promoting Student-Centered Learning in Experiential Education. *Journal of Experimental Education*, 27(2), 141-160
- Figlio, D. N., & Schapiro, M. (2017). Are great teachers' poor scholars. *Brookings: Evidence Speaks Reports*, 2(6). Retrieved from [https://www.brookings.edu/wp-content/uploads/2017/01/es\\_20170126\\_figlio\\_evidence\\_speaks.pdf](https://www.brookings.edu/wp-content/uploads/2017/01/es_20170126_figlio_evidence_speaks.pdf)

- Finlay, L. (2012). Debating phenomenological methods. In *Hermeneutic phenomenology in education* (pp. 17-37). SensePublishers, Rotterdam.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2015). *How to design and evaluate research in education* (Vol. 9). New York: McGraw-Hill.
- Gearing, R. (2004) 'Bracketing in Research: A Typology', *Qualitative Health Research* 14(10): 1429–52.
- Gibbs, G., & Coffey, M. (2004). The impact of training of university teachers on their teaching skills, their approach to teaching and the approach to learning of their students. *Active learning in higher education*, 5(1), 87-100.
- Graham, R. (2015). *Does teaching advance your academic career? Perspectives of promotion procedures in UK higher education*. Royal Academy of Engineering. Retrieved from <https://www.raeng.org.uk/publications/reports/does-teaching-advance-your-academic-career>
- Jenkins, A., Blackman, T., Lindsay, R., & Paton-Saltzberg, R. (1998). Teaching and research: Student perspectives and policy implications. *Studies in Higher Education*, 23(2), 127-141.
- Kini, T. & Podolsky, A. (2016). Does Teaching Experience Increase Teacher Effectiveness: Review of the Research. Retrieved from <http://mrbartonmaths.com/resourcesnew/8.%20Research/Improving%20Teaching/Teaching%20Experience.pdf>
- Lang, J. (2012, October 22). Teaching What You Don't Know. [Blog post]. Retrieved from <https://www.chronicle.com/article/Teaching-What-You-Dont-Know/135180>
- Merkt, M. (2017). The importance of academic teaching competence for the career development of university teachers: A comment from higher education pedagogy. *GMS Journal for Medical Education*, 34(4).
- Moustakas, C. E. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.
- Nicholls, G. (2001). *Professional Development in Higher Education: New Dimensions & Directions*. Routledge.
- Polk, J. [FromPhDtoLife]. (2017, October 17). Did you get any teacher / pedagogical training in grad school for TAs or instructors, before you taught or facilitated in classrooms? [Twitter post]. Retrieved from <https://twitter.com/FromPhDtoLife/status/921790123519434753>

- Postareff, L. & Lindblom-Ylänne, S. (2006). Variation in teachers' descriptions of teaching: Broadening the understanding of teaching in higher education. *Learning and Instruction*, 18(2), 109-120.
- Postareff, L. & Lindblom-Ylänne, S. (2011). Emotions and confidence within teaching in higher education. *Studies in Higher Education*, 36(7), 799-813.
- Ramsden, P. & Moses, I. (1992). Associations between research and teaching in Australian higher education. *Higher Education*, 23(3), 273-295.
- Reflective Teaching. (2018). Yale Center for Teaching and Learning. Retrieved September 10, 2018 from <https://ctl.yale.edu/ReflectiveTeaching>
- Rowland, S., Byron, C., Furedi, F., Padfield, N., & Smyth, T. (1998). Turning Academics into Teachers? *Teaching in Higher Education*, 3(2), 133-141.
- Sadler, I. (2013). The role of self-confidence in learning to teach in higher education. *Innovations in Education and Teaching International*, 50(2), 157-166.
- Tschannen-Moran, M., Woolfolk-Hoy, A., & Hoy, W. K. (1998). Teacher-efficacy: Its meaning and measure. *Review of Educational Research*, 68(

## Discussant Remarks

### The Rookie: A Researcher's First Semester Teaching in a University Classroom

Discussant: J. Shane Robinson, Oklahoma State University

#### Overview/Context

This study was a phenomenological design that sought to describe the self-efficacy of one instructor in a technical science area who had no prior formal teaching experience or preparation. The faculty member, and the students ( $N = 30$ ) enrolled in a Plant and Science course at Mississippi State University, maintained an ongoing journal of the teaching experience throughout the semester. Data were analyzed according to Moustaka's (1994) phenomenological method of analysis from both data sources (i.e., faculty member and students) in a comparative fashion. The themes emerging from the study provided evidence of the instructor's ability to teach effectively, as well as the instructor's dedication to build rapport with students and improve their learning.

#### Strengths

- The Introduction focused on an important topic – the need to offer professional development opportunities to faculty instructors in technical sciences who have had little to no preparation in formal teaching.
- The study included a solid review of the literature and was undergirded in Bandura's (1998) Self-Efficacy theory, a reputable and well-respected theory, pertinent for the study's conceptual focus.
- A substantial amount of text was devoted to explaining the data collection process. This attention to detail regarding the writing prompts and weekly journal entries used to collect data was appreciated.
- The authors included data from a triangulated source consisting of both the instructor of record and students who participated in the course.
- The authors' attempt to weave students' comments with the instructor's in the Findings section made for an easy read and provided good flow, which led to an easy interpretation of the findings.

#### Questions for Consideration

After reading the manuscript, a number of questions arose regarding the study.

- In addition to *bracketing*, mentioned in the Methods section, what other attempts were made to ensure reliability (i.e., credibility, transferability, dependability, and confirmability) of the study's findings? Further, what specific *type* or *class* (i.e., descriptive or hermeneutical, eidetic/essence or transcendental, etc.) of phenomenology was employed? More specification and detail in the Methods section will improve the manuscript's overall quality moving forward.

- What incentives exist for agricultural education faculty to provide professional development to other faculty in the College of Agriculture regarding teaching and learning? What might be the unintended consequences of doing so?
- What impact, if any, did identifying the conceptual framework in the beginning of the manuscript bias the findings of the study as opposed to allowing the framework to *emerge* at the end of the study?
- How do the findings of this study relate to other research related to measuring a person's motivation over time (i.e., student teachers' motivation over their semester-long student teaching internship)? It appears to me that a majority of studies on this topic experience a series of changes in motivation over time. Did the findings in this study align with or refute other work in the literature? In other words, were the findings in this study surprising or were they expected?
- Although this study focused on measuring the instructor's confidence (i.e., efficacy) over time, what role does his or her competence for teaching play in his or her motivation to teach? Perhaps future studies could investigate this phenomenon in conjunction with self-efficacy.

### **Summary**

Overall, I enjoyed reading and following the journey of the faculty member studied and featured in this manuscript. It was interesting to see this person's evolution in motivation over the duration of the semester. For me, the majority of the manuscript read a bit like a diary. Although I respect qualitative research and understand the differences in writing styles between reporting qualitative and quantitative findings, I perceived this study to be more conversational and was a bit heavy on commentary at times. For instance, the manuscript seemed to transition from a technical manuscript in the opening sections to heavy commentary in the middle, and then back to a technical manuscript in the end. I would encourage the authors to have more of a singular voice in the paper moving forward. Having said that, I enjoyed the work put forth by the authors, and applaud them for taking on an important topic and for providing an in-depth assessment of the daily life in the classroom of a first-semester faculty member with no teaching experience.

## Undergraduate Students' Perceptions of Team-Based Learning During an Introductory Agricultural Mechanics Course: A Mixed Methods Study

Whitney L. Figland, Louisiana State University  
Dr. J. Joey Blackburn, Louisiana State University  
Dr. Richie Roberts, Louisiana State University

### Abstract

*In higher education classrooms, teacher-centered instruction remains the dominant learning approach. However, as calls have increased for university graduates to demonstrate the ability to solve complex problems, active learning strategies such as flipped classrooms and team-based learning (TBL), have emerged as popular approaches to ensure students possess such skills. The purpose of this mixed methods study, therefore, was to investigate students' perceptions of TBL in a flipped introductory to agricultural mechanics course. After data collection, the quantitative and qualitative strands were analyzed independently, compared, and then merged to draw meta-inferences. Quantitative findings suggested that students exhibited an overwhelmingly positive view of TBL. Due to the complexity of the qualitative findings, however, they were assigned priority. To understand the intricacies of students' perspectives, we narrated the emergent themes through Brunswick's three zones of judgment: (1) acceptance, (b) non-commitment, and (c) rejection. As a result, we noted more diversity in students' perspectives. However, they remained satisfied with the course overall. Moving forward, we offer recommendations for future research, theory building, and practice in regard to TBL's use.*

### Introduction

One of the most challenging aspects of teaching is to foster a learning environment that meets the needs of diverse learning styles (Loewenberg Ball & Forzani, 2009). In today's university classrooms, teacher-centered activities, such as lectures, remain the most prevalent approach to teaching and learning (Ewing & Whittington, 2009; McCarthy & Anderson, 2000; McCubbins, Paulsen, & Anderson, 2016). However, existing evidence has demonstrated teacher-centered activities often only encourage students to employ lower levels of cognition (Ewing & Whittington, 2009; McCarthy & Anderson, 2000; Whittington & Newcomb, 1993). To encourage higher-level thinking, advocates have begun to utilize active learning strategies (Allen, Donham, & Bernhardt, 2011; Hanson, 2006). Active learning promotes a student-centered learning environment by creating opportunities for students to solve problems in a real-world context (Michealsen & Sweet, 2008; Sibley & Ostafichuk, 2015). Recently, McCubbins, Paulsen, and Anderson (2018) advanced flipped classrooms as an active learning strategy in the preparation of agricultural education teachers to nurture critical thinking skills and reduce the discipline's overreliance on teacher-centered approaches.

Over the past decade, the flipped classroom approach has gained increased attention in secondary and postsecondary education (Barkley, 2015; McCubbins et al., 2018). Such awareness could be the result of teachers' collective efforts to (a) foster higher order thinking, (b) motivation and engagement, and (c) equip students with the skills required by future employers (Lamm, Carter, & Melendez, 2014; McCubbins et al., 2018; Tucker, 2012). Central to the flipped classroom approach, is the transition from teacher-centered to student-centered

instruction (Ewing & Whittington, 2009). Specifically, in a flipped classroom, the delivery of content occurs before formal instruction. Often, students engage with the course material through an online format (Michaelsen, Knight, & Fink, 2004). Such a strategy allows the instructor to devote less time to delivering content and more to conducting activities that empower students to apply their learning (Michaelsen et al., 2004). Although flipped classrooms emerged over five decades ago, empirical evidence supporting its use has been rather scant. Recently, however, some progress has been made in the context of agriculture.

Gardner (2012) utilized a flipped classroom approach in an undergraduate agricultural economics course. Before the course, lectures were converted to an online format, which allowed students to view material beforehand. Then, during class time, students engaged in in-depth discussions about the course material, completed homework, and took assessments. Results indicated students were satisfied with the course and the flipped classroom approach helped them achieve mastery of key concepts. Nevertheless, little evidence suggested that their perceptions and satisfaction with the approach affected their final grade (Gardner, 2012). Similarly, Connor et al. (2014) investigated undergraduate students' perceptions of flipping an agricultural education teaching methods course by transitioning lectures to an online format, which provided curricular space for students to engage in lesson planning, student-led activities, and a plethora of teaching approaches. Findings suggested students were satisfied with the course and perceived the flipped approach supported their learning (Connor et al., 2014). However, they did not value the computer-based lectures and perceived the modules did not support their learning. To further enhance student learning outcomes, some proponents of TBL have begun to incorporate those elements into their flipped classrooms.

TBL is a modified version of the flipped classroom that was introduced in the late 1970s by Lee Michaelsen at Oklahoma State University (Michaelsen et al., 2004; Sibley & Ostafichuk, 2015). TBL is similar to a flipped classroom in that students must learn content before beginning class (Ewing & Whittington, 2009); however, they are placed into teams to engage in learning activities and applications through a more social platform (Michaelsen & Sweet, 2008). A typical TBL course is structured into 5-7 modules, with each module lasting 1-2 weeks. The students participate in online modules to prepare for class and complete an Individual Readiness Assurance Test (IRAT) to assess their content knowledge (Sibley & Ostafichuk, 2015). Then, students meet with predetermined teams to complete a Team Readiness Assurance Test (TRAT) that seeks to clarify students' questions and concerns regarding the topic (Michaelsen & Sweet, 2008). Due to its social nature, TBL is designed to encourage students to gain declarative and procedural knowledge in a given domain (Michaelsen & Sweet, 2008). To implement TBL, practitioners should consider four essential elements: (1) group formation and management of the teams, (2) accountability, (3) feedback, and (4) assessment (Michaelsen & Sweet, 2008). Further, educators must be willing to transition from the classroom authority role to one that more closely resembles a facilitator. It has been noted that instructors and students can be resistant to this transition (Hains & Smith, 2012). However, if TBL is implemented properly, students and instructors' experiences can be more enjoyable (Sibley & Ostafichuk, 2015). In the context of agricultural education, McCubbins et al. (2016) examined student perceptions after engaging in a capstone course that employed the TBL format. Results indicated students had a positive view of the TBL approach and were satisfied with the student-centered learning environment. Also, it was concluded that working in teams positively affected the students' motivations to learn and work collaboratively (McCubbins et al., 2016). In another study,

McCubbins et al. (2018) reported that TBL supported students' critical thinking skills, motivation, and ability to apply the course's concepts contextually. However, despite recent advances in the literature a need existed to understand university students' perspectives as they engaged in TBL in an agricultural mechanics course.

### **Theoretical/Conceptual Framework**

To investigate students' perceptions of TBL, we grounded this study in the social judgment theory [SJT] (Brunswick, 1952). SJT addresses the ways in which individuals' perceptions and judgments shape their willingness to engage in particular activities. SJT also seeks to explain how individuals' perceptions may influence their resulting outcomes. In this study, therefore, we sought to understand how students' perceptions and judgments of TBL might have influenced their perceived outcomes of the *Introduction to Agricultural Mechanics* course under investigation. In SJT, individuals' perceptions on a topic, issue, or experience are placed on a continuum of acceptance (Hammond, Rohrbaugh, Mumpower, & Adelman, 1977). The continuum consists of three primary zones: (a) acceptance, (b) non-commitment, and (c) rejection that anchor individuals' views (Hammond et al., 1977). The acceptance zone refers to the state when individuals associate a high level of value during a judgment and perceive incorporating the associated behavior may positively affect their lives (Cooksey, 1996). In the zone of non-commitment, individuals associate some perceived value; however, their commitment remains relative and largely situational (Cooksey, 1996). In the final zone, rejection, individuals do not perceive value and choose to disengage (Hammond et al., 1977). Because the theoretical framework (Brunswick, 1952) was presented on a continuum of shifting progression, we were uniquely positioned to view the shifts, conflicts, and maturation of students' perspectives on TBL during one academic semester. As a result, we sought the diverse views of students on this phenomenon by engaging a range of data sources.

### **Purpose and Objective**

The purpose of this mixed methods study was to describe students' perceptions of TBL in the *Introduction to Agricultural Mechanics* course at Louisiana State University. This research supports Priority 4: Meaningful, Engaged Learning in All Environments (Edgar, Retallick, & Jones, 2016) of the American Association for Agricultural Education's (AAAE's) National Research Agenda. Specifically, this study addressed how the delivery of "educational programs in agriculture continually evolve to meet the needs and interests of students" (Edgar et al., 2016, p. 38). One research question guided this study: *What were university students' perceptions of TBL during Louisiana State University's Introduction to Agricultural Mechanics course in the spring 2018 semester?*

### **Background of the Study**

The *Introduction to Agricultural Mechanics* course was held twice weekly for approximately 110 minutes per session. The Spring 2018 semester was the first time the course was flipped using the TBL format. Despite the new delivery approach, the course's four-pronged foci remained consistent with previous semesters: (a) laboratory safety, (b) agricultural structures (i.e., carpentry), (c) residential electricity/wiring, and (d) small gasoline engines. Content related to the course was provided through Louisiana State University's online learning platform, which included: (1) online readings; (2) videos; and (3) supplemental material. In all, the content was

divided in to eight modules, including: (a) one module focused on safety, (b) one on agricultural structures, (c) one on electricity, and (d) five concerning small gasoline engines (e.g., tool/part identification, 4-cycle theory/carburation, ignition and governors, cooling and lubrication, and troubleshooting).

Further, we employed Roberts, Stripling, and Estep’s (2010) taxonomy of learning activities (TLA) to guide our design of the course. In its development, the TLA model was designed to understand the major approaches to teaching and learning by depicting their relational nature on a continuum of instructional methods and learning interactions (see Figure 1).

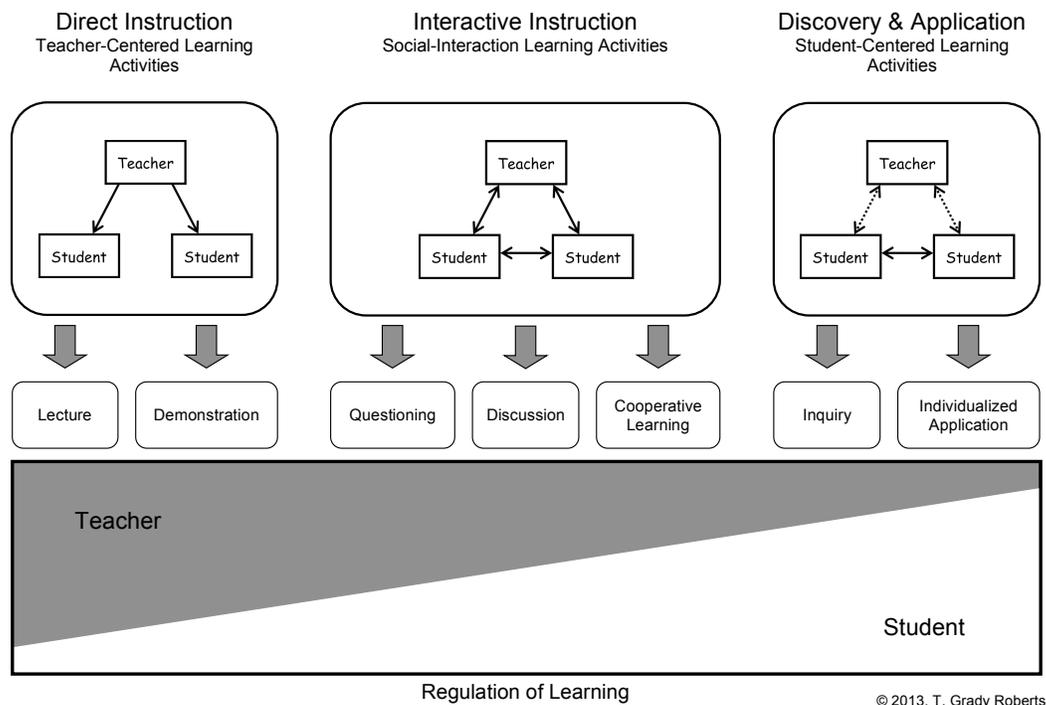


Figure 1. From “A conceptual model of learning activities for college instructors [Abstract],” by T. G. Roberts, C. M. Stripling, and C. D. Estep, 2010, *NACTA Journal*, 54(1) Supplement, p. 71. Copyright 2010 (2013) by NACTA Journal. Reprinted with permission.

Therefore, the TLA continuum demonstrated how instructors could transition from a teacher to a student-centered approach utilizing techniques such as questioning, cooperative learning, and inquiry-based instruction (Roberts et al., 2010). In this course, TBL was conceptualized as a strategy that scaled Roberts et al. (2010) TLA continuum. For example, lessons in the *Introduction to Agricultural Mechanics* course began with student-centered activities (i.e., readings, and online PowerPoints). At each session’s end, however, students advanced through the TLA model by engaging in application exercises and individual projects. Table 1 presents the parallels of TLA model to the course’s TBL activities.

Table 1

### *Parallels between the Taxonomy of Learning Activities and Team-Based Learning*

TLA (Roberts et al., 2010)	TBL Activities
Teacher-Centered Activities	Preparation
Lecture	Out-of-class reading
Demonstration	Out-of-class reading
Social Interaction Activities	Preparation/Application
Questioning	Individual and team tests
Discussion	Corrective instruction, application activities
Cooperative Learning	Team tests, appeals, application activities
Student-Centered Activities	Application/Assessment
Inquiry	Individual application exercises, review
Individual Application	Individual application exercises, project

*Note.* From “Student Perceptions Concerning their Experience in a Flipped Undergraduate Capstone Course,” by OP McCubbins, T. H. Paulsen, and R. G. Anderson, 2016, *Journal of Agricultural Education*, 57(3), p. 72. Copyright 2016 by the Journal of Agricultural Education.

Guided by the TLA and the principles of TBL, we divided students into teams of four and they remained in those groups throughout the course. The course was designed into 5-7 modules consisting of four major topics (a) safety, (b) structures, (c) electricity, and (d) small gasoline engines and each online module was designed to be completed in 1-2 hours. After each online module, students completed a battery of formative assessments beginning with the IRAT over the course material. The purpose of the IRAT was to assess students’ learning after the completion of the online content. Next, students were administered a TRAT, which was comprised of the same items as the IRAT. The purpose of the TRAT was to allow students to work together to discuss their thinking and arrive at a final consensus concerning answers on the formative assessments. Further, the IRATs and TRATs are employed to hold students accountable for engaging in the online content. The IRATs and TRATs typically consisted of 15 to 25 items, depending on the module. One of the central elements of TBL is the requirement of immediate feedback. To accomplish this, the researchers utilized GradeCam® software. GradeCam® allowed us to create an optical answer sheet for the IRAT and TRAT assessments. As students completed the assessments, a smartphone application was utilized to scan students’ answer sheets. Then, GradeCam® software scored individual answer sheets to determine the accuracy of students’ responses. This allowed us to review results and provide timely feedback. After each instrument was completed, the remainder of the course was dedicated to hands-on, application based activities in the agricultural mechanics laboratory. This course was structured to be 25% in-class discussion/tests and 75% application based.

### **Methodology and Procedures**

This study analyzed the perceptions of undergraduate students as they engaged in TBL during an introductory agricultural mechanics course. To accomplish such, we used a pragmatist lens (Morgan, 2007) to nest our methodological decisions in the convergent parallel, mixed methods design (Creswell & Plano Clark, 2018). Convergent parallel studies aim to draw on different strands of data, quantitative and qualitative, to offer a more complex understanding of

the phenomenon (Creswell & Plano-Clark, 2018). Due to the nature of this study, collection of the quantitative and qualitative was timed to occur concurrently (Tashakkori & Teddlie, 2003). Thereafter, each strand was analyzed independently, compared, and then merged to draw meta-inferences. As a result, the point of interface between the two strands occurred during analysis and interpretation. Due to the richness of the qualitative strand, however, it was assigned priority a posteriori, i.e., Quan + QUAL (Tashakkori & Teddlie, 2003). We collected data in the quantitative strand by gathering participants' responses to a summative evaluation of the course, which was administered by Louisiana State University's Testing & Evaluation Services. In total, eight ( $n = 8$ ; 47% response rate) students completed the web-based evaluation at the conclusion of the spring 2018 semester. Meanwhile, Stake's (1995) instrumental case study design was employed to ground our procedures in the qualitative strand. Using Stake's (1995) approach allowed us to gain a deeper, more holistic understanding of students' perceptions of TBL. It should also be noted that the unit of analysis and time bounded the case (Stake, 1995). For instance, participants' experiences with TBL during the course were limited to one academic semester. Qualitative data were derived from focus group interviews ( $n = 9$ ), observations, and students' written statements to open-ended items on the summative evaluation of the course.

### **Role of the Researchers**

To own our biases and perspectives (Patton, 2002), it is critical to acknowledge that our engagement varied considerably depending on the strand of data. For example, in the quantitative phase, we maintained a post-positivist position (Charles & Mertler, 2002) in which the phenomenon was assessed through numeric items. In the qualitative phase, however, we attempted to make sense of textual and observatory data using a constructionist (Crotty, 1998) epistemological lens to provide an intricate, contextually situated depiction of the phenomenon. It is also important to reveal that the lead researcher severed as the graduate assistant for the course under investigation. As a result, she positioned herself as a participant observer (Patton, 2002) throughout the course's activities. The instructor of record for the course also served as a member of the research team. These insider perspectives (Saldaña, 2015) had the potential to introduce biases into the interpretation of the study's findings. To reduce such influences, a third researcher, with a background in qualitative research, provided methodological guidance during value-laden decision junctures.

### **Participants**

In this investigation, participants ( $N = 17$ ) were undergraduate students at Louisiana State University enrolled in the *Introduction to Agricultural Mechanics* course during the spring 2018 semester. Of the participants, nine were males, and eight were female with an average age of 21 years old. In all, eight majored in agricultural & extension education, three in plant & soil systems, two in animal science, two in mechanical engineering, one in agricultural business, and one in renewable natural resources.

### **Data Collection and Analysis**

In the quantitative strand, data were collected using a web-based course evaluation. Students were sent an email invitation from Louisiana State University Testing & Evaluation Services to participate; then, the lead researcher encouraged students to complete the evaluation by dedicating 15 minutes of instructional time for the completion of the instrument. The course

evaluation was comprised of 10 Likert-type items using the following anchors to determine agreement: 5 = *Strongly Agree*; 4 = *Agree*; 3 = *Neutral*; 2 = *Disagree*; and 1 = *Strongly Disagree*. However, only three items were relevant to students' perceptions of the course; therefore, the other items were not featured in this manuscript. On the course evaluation, students also had the opportunity to provide written statements. In all, eight (47%) students completed the web-based instrument.

To recruit students in the qualitative strand, the researchers offered bonus points in the course for participation ( $n = 9$ ) in a focus group interview. During the interview, the lead researcher used a semi-structured interview protocol to elicit participants' perceptions regarding the use of TBL. During this phase, the researchers also upheld standards of ethical research by concealing participants' identities by assigning them a participant number. The interview lasted approximately 45 minutes and was recorded using an iPhone® application. Then, the lead researcher transcribed the interview verbatim. To analyze the qualitative data, we employed Corbin and Strauss' (2015) constant comparative method. To facilitate this process, we employed Saldaña's (2018) coding recommendations by which we engaged in (a) open, (b) axial, and (c) selective coding techniques. For example, we began this process by independently open coding the data corpus. Then, during axial coding, we analyzed relationships among the open codes and began to collapse them into categories (Corbin & Strauss, 2015). After this phase, we met to discuss our evidentiary warrants developed as a result of the first two rounds of coding and negotiated discrepancies in our interpretations (Corbin & Strauss, 2015). Finally, we employed selective coding as a way "think with theory" (Jackson & Mazzei, 2012, p. 6) as we reengaged the data and weaved context and meaning while simultaneously reducing categories into themes. We then narrated the resulting themes through the lens of Bruswick's (1952) SJT.

### **Qualitative Quality**

Before presenting the study's findings, however, it is important to address our techniques for imbuing rigor. In this study, we ensured trustworthiness by grounding our ethical decision-making in Lincoln and Guba's (1985) standards – confirmability, dependability, credibility, and transferability – for qualitative quality. For example, we were explicit about how our biases and assumptions might have influenced our interpretations (confirmability), engaged in multiple rounds of coding and negotiated emergent discrepancies (dependability), ensured findings were contextually grounded and rich in description (credibility), and attempted to mobilize findings that might be considered applicable across contexts (transferability).

### **Findings**

After a separate analysis of each strand of data, we interactively merged (Creswell & Plano Clark, 2018) the results of each. The product of this merger was the development of a matrix (see Table 1) that featured the quantitative results (i.e., means and standard deviations from items on the course evaluation) compared to qualitative findings. The merger of data strands demonstrated the existence of both congruent and discrepant findings. For interpretation, the real limits for the quantitative items were 1.00 to 1.49 = *Strongly Disagree*, 1.50 to 2.49 = *Disagree*, 2.50 to 3.49 = *Neutral*, 3.50 to 4.49 = *Agree*, and 4.50 to 5.00 = *Strongly Agree*. The three quantitative items yielded mean responses of *Strongly Agree*.

Table 1

*Linking [University] Undergraduate Students' Evaluations of a TBL Formatted Course to Qualitative Perceptions*

<i>M</i>	<i>SD</i>	Congruent Statements	Discrepant Statements
<i>Item 1. Course activities and materials were valuable to my learning</i>			
		“The readings were very helpful in understanding background knowledge” (FG <sup>a</sup> ; Participant #4).	“Personally I hate everything online. I would rather had everything printed” (FG <sup>a</sup> ; Participant #3).
4.88	0.35	“IRATs were helpful because it made sure that you kept up with the reading materials: (FG <sup>a</sup> ; Participant #4).	“Some of the readings were very long and the information was hard to understand” (FG <sup>a</sup> ; Participant #7).
		“[TBL] is a lot better than just sitting in a lecture and having to sit” (FG; Participant #4).	“Sometimes it was difficult to collaborate with your group members, especially if they were at different stages of the project” (FG <sup>a</sup> ; Participant #8).
<i>Item 2. This course gave me the opportunity to improve my knowledge and skills in this subject matter</i>			
		“This is one of the few courses at [University] that has challenged me, really taught me something and that I’ve enjoyed” (WC <sup>b</sup> ).	“For me, I can read the content and it doesn’t really mean anything to me.” (FG <sup>a</sup> ; Participant #8).
4.75	0.46	“TRATs also helped to reinforce the material more . . . one of your team members might have been like ‘oh, I remember reading this’ and they could explain it” (FG <sup>a</sup> ; Participant #6).	“I don’t like online readings very well, so it made it harder to learn” (FG <sup>a</sup> ; Participant #2).
<i>Item 3. Overall, I would rate this course as excellent</i>			
4.75	0.46	“This is the best type of flipped classroom I have been in. We actually get to do the application rather than just read about it and then learn more in class” (FG <sup>a</sup> ; Participant #5).	“It would have been nice to have a clearer understanding of the objectives for each topic and what needs to be accomplished each day” (FG <sup>a</sup> ; Participant #1).

*Note.* 5 = *Strongly Agree*; 4 = *Agree*, 3 = *Neutral*, 2 = *Disagree*, and 1 = *Strongly Disagree*. <sup>a</sup>FG indicated that data were obtained from the focus group interviews. <sup>b</sup>WC indicated that data were obtained from students’ written comments on the course evaluation.

After merging the data strands, we recognized the need to more intimately investigate the corresponding and conflicting findings. As such, we assigned priority to the qualitative strand and scrutinized the emergent findings further. Using this procedure, we distilled themes that were mobilized through the lens of Bruswick's (1952) three zones of judgment: (1) acceptance, (b) non-commitment, and (c) rejection. When viewed through SJT, the themes reflect the range and complexity of perspectives that students held about the use of TBL in Louisiana State University's *Introduction to Agricultural Mechanics* course. Drawing on salient examples from our analysis, the three themes and supporting sub-themes maneuver among and between Bruswick's (1952) zones of judgment to offer variant perspectives on the phenomenon.

### **Theme 1: The Zone of Acceptance**

The first theme illuminated students' optimistic views (Hammond et al., 1977) regarding TBL. For example, the participating students perceived certain aspects of the approach influenced their course-based experiences and learning in positive ways. The aspects that most profoundly encouraged participants to move into the zone of acceptance are narrated through three subthemes: (1) flipped classroom design, (2) teams, and (3) formative assessments.

**Flipped Classroom Design.** When asked to reflect on the ways in which the flipped classroom approach impacted their learning, participants articulated that the course's structure was more conducive to learning than traditional approaches. For example, Participant #1 stated: "this way [the flipped classroom approach] was a lot more helpful because you can read the content yourself and then in class you get to apply it... [and] the ideas become more concrete". The students also expressed positive views about TBL. Participant #3 maintained:

I like the interaction between not only the students, graduate student, and professor, but the whole class. Like we all are able to help each other and learn from each other. We are learning the material in a very interactive way that is more than just knowing the course material, but actually about applying what we have learned.

Participant's #2 and #8 indicated they had been involved in a flipped classroom environment before; however, they preferred the approach used in the course under investigation. Participant #2 explained: "This is the best type of flipped classroom I have been in. We actually get to do the application rather than just read about it and take a test and then learn more in class." Further, one student remarked in the written comments section of the course evaluation, "excellent class structure, with emphasis on student participation."

**Teams.** In accordance with TBL, students were placed on a team at the beginning of the semester. When asked to reflect on whether their teams affected their learning, Participant's #1, #3, and #6 maintained that interactions with their team allowed them to understand alternative perspectives, collaborate, and co-construct new knowledge. Participant #1 elaborated: "I think it was especially helpful for problem-solving because it helped [me] to gain a new perspective and way of thinking that you might not have thought of before." Meanwhile, Participant #5 suggested the greatest advantage of TBL was when his group alternated between student and teacher roles to learn course concepts. Finally, Participant #4 posited that she valued TBL because it helped facilitate a constant exchange of ideas and views among group members, which stoked a greater

curiosity for the course's content. TBL also appeared to help some participants gain self-efficacy. Participant #4 explained: "my team gave me a confidence booster in my ability to complete projects in this course."

**Formative Assessments.** Participants also largely agreed that the use of formative assessments (i.e., IRATs and TRATs) were helpful in assisting them to gauge their level of understanding of the course's content and address any deficiencies before applying their learning in a laboratory setting. Participant #4 explained: "the IRAT's were helpful because [they] made sure that you kept up with the reading materials." Participants also perceived that formative assessments reinforced the course's central concepts and that team-based formative assessments, i.e., TRATs, were beneficial. Participant #6 stated: "the TRAT's also helped to enforce the material more and talk about something [I] didn't understand with [my] teammates. One of your [team] members might have understood a topic better and [they] could explain it to you."

## **Theme 2: The Zone of Non-Commitment**

The second theme highlighted students' perspectives on elements of TBL they viewed as valuable; however, they also articulated these aspects warranted further consideration by instructors. As a result, participants assigned (a) the course's structure and (b) lecture sessions to The Zone of Non-Commitment.

**The Courses Structure.** Although the majority of participants articulated that TBL had a positive impact on their learning, they also pointed to areas that should be evaluated moving forward. For example, students expressed positive views of the course's web-based elements. However, Participant #3 conveyed: "the only thing I would like different is to have the readings handed out instead of online." However, through our observations, we noted that students expressed a reluctance to complete the course readings regardless of whether the materials were provided online or printed and distributed individually. In this study, students also expressed positive views in regard to the course's flipped structure; however, they suggested that clearer directions and explanations should be provided in the future. For instance, Participant's #4 and #5 explained that such a change might help students have a "clearer understanding" of each lesson's objectives and expectations concerning projects.

**Lecture Sessions.** The participants also conveyed the reduced focus on lecture-based instruction was a positive attribute; nevertheless, they maintained that some topics were complex and required more reinforcement through in-class discussions. Participant's #3 and #9 also recommended creating more curricular space for "reviewing and reflecting" on course concepts. Participant #1 desired the lecture to occur in a more scheduled fashion, specifically she indicated:

[We] were told every Monday we were going to have an IRAT and TRAT . . . but with the snow days our schedule got messed up and kind of shifted everything. Before, we knew we would at least have the weekend to review the material before we had our test on Monday. So I think if we could have continued with that type of structure it would have been a lot easier to understand the material better.

## **Theme 3: The Zone of Rejection**

The final theme offered participants' views on aspects of TBL they did not assign value; instead, they articulated such activities should be discontinued. The elements of TBL that students assigned to The Zone of Rejection included: (a) online modules and (b) readings.

**Online Modules.** Participants suggested the use of the online content delivery method was confusing and lacked clarity. Participant #3 echoed this sentiment: "I hate everything online because it's harder to digest the material." Participant #9 explained, "[the] general organization of course content needs [to be] changed, but don't change the information [in the modules] because it was helpful."

**Readings.** Participants also conveyed that the course's readings were poorly organized, difficult, and overwhelming. As Participant #8 explained, "some of the readings were too long and was almost hard to understand." Meanwhile, Participant #5 called for a "better organization of the online materials, and shorter readings. . ." In our observations, we noted that some of the readings covered complex topics and students struggled with comprehending the material. For example, the module related to carburation contained readings that discussed how Bernoulli's principle applies to carburetor theory. Multiple students arrived early to this particular class period to ask questions because they were concerned about the upcoming IRAT. Consequently, their IRAT and TRAT assessment scores were lower than previous modules.

### Conclusions

The purpose of this mixed methods study was to describe students' perceptions of TBL in the *Introduction to Agricultural Mechanics* course at Louisiana State University. In the quantitative strand, students reported an overwhelmingly positive perception of the method of instruction. However, through the qualitative strand, students articulated more intricate views. As a consequence, we explored participants' variant perspectives through the lens of Brunswick's (1957) three zones of judgment: (1) acceptance, (b) non-commitment, and (c) rejection. The qualitative strand, therefore, reflected the range and complexity of students' perspectives on TBL.

The first theme, The Zone of Acceptance, represented aspects of the course students assigned a high level of value and that positively affected their course-related experiences. The three aspects most significantly influencing their perspectives were: (1) the flipped classroom design; (2) teams; and (3) formative assessments. For example, students articulated that TBL enhanced their problem-solving skills as well as their self-efficacy concerning agricultural mechanics. They also noted that the course's formative assessments, i.e., the IRATs/TRATs, helped them understand the material, which was beneficial before they applied concepts in a laboratory setting. These findings, therefore, support previously reported literature (Garder, 2012; McCubbins et al., 2016, 2018) on the use of flipped classrooms in the context of agriculture.

In the second theme, The Zone of Non-Commitment, students noted elements – the course's structure and lecture sessions – of the approach they valued but deserved further consideration by instructors. For instance, regarding the course's structure, they expressed positive views of the content but suggested that readings should be provided in-print rather than

through the course's online platform. Because TBL is a shift from a traditional lecture-based course, it is possible the students' criticisms of the course's structure were based on their apprehension to embrace a more student-centered style (Roberts et al., 2010). On this issue, Hains and Smith (2012) noted that gaining student buy-in can be difficult in flipped courses. Perhaps, therefore, students need additional reinforcement of the course's concepts before applying their learning concretely.

In the final theme, The Zone of Rejection, participants' isolated two factors of TBL they perceived should be disregarded: (1) online modules and (2) readings. As an illustration, the students maintained the course's online modules lacked clarity and organization. The students also conveyed that some of the materials were long and difficult to digest. The criticisms are consistent with the existing evidence (Conner et al., 2011; Strayer, 2007) that reported students are often dissatisfied with aspects of flipped classrooms, but largely value the experience overall.

### **Implications, Recommendations, and Discussion**

Recognizing the need for today's graduates to solve complex problems, work collaboratively, and adapt to evolving contexts (Lamm et al., 2014), this study's findings provided several implications for future research, theory-building, and practice. For example, findings suggested that students' valued TBL. Perhaps such an instructional approach provided the laboratory-based, instructional time required by students to gain competence and self-efficacy in agricultural mechanics. These findings are noteworthy considering that knowledge and skills in agricultural mechanics remain one of the primary concerns of school-based, agricultural education (SBAE) teachers (Rasty, Anderson, & Paulsen, 2017). As a consequence, we recommend future research investigate the long-term and short-term effects of TBL, especially in the context of agricultural mechanics. Given the findings of this study, we also suggest that future research explore the role of TBL of students' conceptual and procedural knowledge as well as their resulting critical thinking and problem-solving skills. Additional work should also be conducted to examine the effects of TBL on students' content-based knowledge.

In the study, we used Brunswick's (1952) SJT to interpret the study's findings. SJT served as a productive lens to examine the range of students' perspectives on TBL. Nevertheless, it did have some weaknesses. For example, the theory provided little guidance on how to move individuals' judgments out of the zones of non-commitment and rejection. We, therefore, recommend that additional theory-building efforts be conducted to identify the factors that presage individuals to judge whether an activity lacks value and stimulates an associated negative perception. In this investigation, we noted that students' negative views usually emerged as a result of apprehension to embrace a more student-centered instructional approach. Perhaps, future theory-building efforts should, therefore, seek to explain whether factors such as time and intensity more profoundly influence individuals' judgments on a phenomenon.

This study also pointed to several recommendations for future practice. First, university instructors should carefully consider how they structure and organize their online content when using TBL. Further, supplemental videos and other materials could also be created to reduce students' anxiety about complex topics. For example, instructors might create a series of video-related content that expands on concepts. Based on the feedback from participants, we also

suggest that university instructors consider using TBL in undergraduate courses, particularly if the course contains a laboratory component. Perhaps such an instructional change could help instill students with the employability skills they need to thrive in the workforce.

### **Limitations of the Study**

Finally, several limitations need to be addressed in this study. First, in the quantitative strand, data were collected through a course evaluation designed and administered by Louisiana State University's Testing and Evaluation Services. The web-based instrument is used across Louisiana University's system to assess students' views on courses. Despite the instrument's widespread use, however, information is not available regarding its reliability. Further, a test/retest reliability approach was not ethical because of the need for student anonymity. Because of these limitations, we chose to collect qualitative data, but as with any naturalistic approach, other researchers might have interpreted the data differently.

### **References**

- Ilen, D. E., Donham, R. S., & Bernhardt, S. A. (2011). Problem-based learning. *New directions for Teaching and Learning*, 2011(128), 21–29. doi: 10.1002/tl.465.
- Barkley, A. (2015). Flipping the college classroom for enhanced student learning. *NACTA Journal*, 59(3), 240–244. Retrieved from [https://www.nactateachers.org/attachments/article/2312/16%20%20Barkley\\_Sept2015%20NACTA%20Journal-10.pdf](https://www.nactateachers.org/attachments/article/2312/16%20%20Barkley_Sept2015%20NACTA%20Journal-10.pdf)
- Brunswick, E. (1952). *The conceptual framework of psychology*. Chicago, IL: University of Chicago Press.
- Chapman, G., Loveless, T., & Roberts, L. G. (2000). Federal support for technology in K-12 education. *Brookings Papers on Education Policy*, 2000(3), 307–357. Retrieved from [https://www.jstor.org/stable/20067225?seq=1#metadata\\_info\\_tab\\_contents](https://www.jstor.org/stable/20067225?seq=1#metadata_info_tab_contents)
- Charles, C. M., & Mertler, C. A. (2002). *Introduction to educational research* (4th ed.). Boston, MA: Allyn and Bacon.
- Conner, N. W., Stripling, C. T., Blythe, J. M., Roberts, T. G., & Stedman, N. L. (2014). Flipping an agricultural education teaching methods course. *Journal of Agricultural Education*, 55(2), 66–78. doi:10.5032/jae.2014.02066
- Cooksey, R. W. (1996). *Judgment analysis: Theory, methods, and applications*. San Diego, CA: Academic Press.
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Thousand Oaks, CA: Sage.

- Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. Thousand Oaks, CA: Sage.
- 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* (pp. 49–56). Gainesville, FL: Department of Agricultural Education and Communication, University of Florida.
- Ewing, J. C., & Whittington, M. S. (2009). Describing the cognitive level of professor discourse and student cognition in college of agriculture class sessions. *Journal of Agricultural Education*, 50(4), 36–49. doi:10.5032/jae.2009.04036
- Gardner, J. G. (2012). *The inverted agricultural economics classroom: A new way to teach? A new way to learn?* Paper presented at the Annual Meeting of the Agricultural and Applied Economics Association, Seattle, WA. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.464.6864&rep=rep1&type=pdf>
- Hains, B. J., & Smith, B. (2012). Student-centered course design: Empowering students to become self-directed learners. *Journal of Experiential Education*, 35(2), 357–374. Retrieved from <https://doi.org/10.1177/105382591203500206>
- Hammond, K. R., Rohrbaugh, J., Mumpower, J., & Adelman, L. (1977). Social judgement theory: Applications in policy formation. In M. Kaplan & S. Schwartz (Eds.), *Human judgement and decision process in applied settings* (pp. 1–30). New York, NY: Academic Press.
- Hanson, D. M. (2006). *Instructor's guide to process-oriented guided-inquiry learning*. Lisle, IL: Pacific Crest.
- Jackson, A. Y., & Mazzei, L. A. (2012). *Thinking with theory in qualitative research: Viewing data across multiple perspectives*. New York, NY: Routledge.
- Lamm, K. W., Carter, H. S., & Melendez, M. W. (2014). Investigating the linkage between intrinsic motivation and project team satisfaction in undergraduate agricultural leadership students. *Journal of Agricultural Education*, 55(3), 103–115. doi: 10.5032/jae.2014.03103
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.
- Loewenberg Ball, D., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of Teacher Education*, 60(5), 497–511. Retrieved from <https://doi.org/10.1177/0022487109348479>
- McCarthy, J. P., & Anderson, L. (2000). Active learning techniques versus traditional teaching styles: Two experiments from history and political science. *Innovative Higher Education*, 24(4), 279–294. Retrieved from <https://link.springer.com/article/10.1023/B:IHIE.0000047415.48495.05>

- McCubbins, O. P., Paulsen, T. H., & Anderson, R. G. (2016). Student perceptions concerning their experience in a flipped undergraduate capstone course. *Journal of Agricultural Education*, 57(3), 70–86. doi:10.5032/jae.2016.03070
- McCubbins, O. P., Paulsen, T. H., & Anderson, R. (2018). Student engagement in a team-based capstone course: A comparison of what students do and what instructors value. *Journal of Research in Technical Careers*, 2(1), 8–21. Retrieved from <https://digitalscholarship.unlv.edu/cgi/viewcontent.cgi?article=1029&context=jrtc>
- Michaelsen, L. K., & Sweet, M. (2008). The essential elements of team-based learning. *New Directions for Teaching and Learning*, 2008(116), 7–27. Retrieved from <https://doi.org/10.1002/tl.330>
- Michaelsen, L. K., Knight, A. B., & Fink, L. D. (2004). *Team-based learning: A transformative use of small groups in higher education*. Sterling, VA: Stylus.
- Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1), 48–76. doi:10.1177/2345678906292462
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Rasty, J., Anderson, R. G., & Paulsen, T. H. (2017). How the quantity of agricultural mechanics training received at the secondary level impact teacher perceived importance of agricultural mechanics skills. *Journal of Agricultural Education*, 58(1), 36–53. doi: 10.5032/jae.2017.01036
- Roberts, T. G., Stripling, C. D., & Estep, C. M. (2010). *Developing a conceptual model for a teaching methods course*. Paper presented at the Southern Region Conference of the American Association for Agricultural Education. Orlando, FL. Retrieved from <http://aaaeonline.org/Resources/Documents/Southern20Region/Research202010.pdf>
- Saldaña, J. (2018). *The coding manual for qualitative researchers* (3rd ed.). Thousand Oaks, CA: Sage.
- Sibley, J., & Ostafichuk, P. (2015). *Getting started with team-based learning*. Stylus Publishing, LLC.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage Publications.
- Strayer, J. (2007). *The effects of the classroom flip on the learning environment: A comparison of learning activity in a traditional classroom and a flip classroom that used an intelligent tutoring system* (Doctoral dissertation). Retrieved from [http://rave.ohiolink.edu/etdc/view?acc\\_num=osu1189523914](http://rave.ohiolink.edu/etdc/view?acc_num=osu1189523914)
- Tashakkori, A., & Teddlie, C. (2003). *Mixed methodology: Combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.

Tucker, B. (2012). The flipped classroom. *Education Next*, 12(1), 82–83. Retrieved from [http://www.msuedtechsandbox.com/MAETELy2-2015/wp-content/uploads/2015/07/the\\_flipped\\_classroom\\_article\\_2.pdf](http://www.msuedtechsandbox.com/MAETELy2-2015/wp-content/uploads/2015/07/the_flipped_classroom_article_2.pdf)

Whittington, M. S., & Newcomb, L. H. (1993). Aspired cognitive levels of instruction, assessed cognitive levels of instruction and attitude toward teaching at higher cognitive levels. *Journal of Agricultural Educ*

**No Discussant Remarks**

## Improving Forestry Secondary Education: Identifying Teachers' Needs

Eric D. Rubenstein, University of Georgia  
Carolyn A. Copenheaver, Virginia Tech  
Jason B. Peake, University of Georgia

### Abstract

*Industrial, technological, and societal changes require teachers to be continually engaged in professional learning activities that promote new scientific approaches to education and content. Providing teachers with current and relevant professional development is an important task in secondary education. This study sought to identify the professional development needs for educators who teach forestry and forest ecosystem content to secondary students. Researchers used the Delphi method with two participant groups to investigate the diversity of thought held throughout the southeastern United States. Participants were agriculture and environmental science teachers, state department of education administrators, foresters, and environmental scientists. Participants identified eleven areas of educational need: 1. Forestry career days, 2. Tree diseases and pathogens, 3. Graduation requirements limit student opportunities to take electives, 4. Career counseling in forestry jobs, 5. Educate students about degrees needed for forestry careers, 6. Over commitment of students to extra-curricular activities, 7. Lack of foundational forestry knowledge, 8. Lack of forestry /agriculture programs in schools, 9. Develop forestry electives in middle school, 10. Lack of foundational forest management knowledge, and 11. Connect classroom content to FFA and Envirothon extra-curricular activities.*

**Keywords:** forestry education, professional development, Delphi method, classroom instruction

**Authors' Note:** This paper is a product of USDA NIFA SPECA Grant No. 2017-28414-26957.

### Introduction and Literature Review

Undergraduate forestry programs in the United States have experienced a steady decline in enrollment over the past three decades, which appears to correspond with a reciprocal increase in enrollment in environmental studies programs (Sharik et al., 2015). Both of these degree programs attract individuals interested in working outdoors; however, forestry requires more quantitative, science-based coursework, a reason often cited by students for why they opted for more generalist environmental studies majors (Sharik et al., 2015). Another challenge for recruiting students into forestry programs is the perception that forestry courses are less welcoming to women and minorities than environmental studies programs (Rouleau et al., 2017). This reduction in students pursuing forestry degrees coincides with a peak in employment opportunities for recent forestry graduates (Connaughton 2015), which leaves forestry undergraduate programs struggling to recruit students and looking towards secondary educators as a pipeline for potential forestry students.

Most secondary science and agriculture educators identify forestry as an important topic to cover in their classes; however, the likelihood of including forestry content in the classroom directly relates to a teacher's confidence and familiarity with the discipline (Munsell et al., 2016). High school agriculture educators in West Virginia identified the top factor preventing them from teaching forestry content in their classes was a lack of knowledge about forest management (Lockerman Friend, 2008). Most educators are more comfortable including content about forest ecosystems in their classes than forest management content (Munsell et al., 2016). One of the commonly perceived obstacles to teaching forestry is the assumption that forestry education must occur within a forest rather than in a traditional classroom setting and high school educators wish to avoid the additional work and expense involved in organizing class field trips (Fuhrman et al., 2014; McCabe et al. 2014).

The objective of this project was to identify professional development needs of secondary educators in teaching content about forests and forestry in their classes. Agriculture and environmental science teachers have a continuing need for in-service training to ensure that they are current with industry standards (Barrick, Ladewig, & Hedges, 1983). The need for appropriate and timely pre-service and in-service trainings for teachers to ensure that they are properly equipped to contend with changing conditions in career and technical areas (Joerger, 2002). Pre-service and in-service trainings need to be provided to teachers to keep them current on industry specific competencies, however it is difficult to identify what trainings are most appropriate and needed (Peake et al., 2007). Teaching is not a routine job and as technology advances teachers must be continually retrained especially, in a rapidly changing global environment (Darling-Hammond, 2006).

Wide spread concerns ranging from climate change to societal views of forestry are accelerating the rate at which forestry professionals are adopting advances in forest equipment. In 2015, the USDA Forest Service acknowledged the need to increase their efficiency with communicating new technologies and disseminating information to foresters and to "find effective ways of communicating resource data and new knowledge and making it widely available, using social media, publications, the Internet, and other tools that have a global reach for disseminating information" (USDA Forest Service 2015, p. 27). Forestry equipment will advance substantially over the 30-year span of an educator's teaching career and thus mandates the need for continuous professional development. Therefore, this study examined the professional development needs of educators to assist with increasing their abilities to teach forestry concepts and encourage students to enter the forestry profession.

### **Conceptual Framework**

Using the conceptual framework developed by Roberts and Ball (2009), the researchers in this study sought to improve forestry secondary education by identifying teachers' needs. The conceptual model for teaching agriculture as a content and context ensures all stakeholders in a community and school are engaged in the learning process to develop an educational curriculum to meet industrial and societal needs (Figure 1). Specifically, this study examined educators' needs to develop an integrated curriculum in forestry. The educators' knowledge of the specific content area is vital to ensuring the correct skills, knowledge, and competencies have been taught to learners.

This conceptual framework requires the integrated curriculum incorporate both content substantiated in the current industrial practices and within the context of the industry. The integrated curriculum should incorporate knowledge across all core subject areas and ensure that specific industry-based skills have been corroborated by industry experts. This integrated curriculum can then be taught through a process of a facilitated learning environment between the learner and the educator. This process of instruction prepares learners to enter a skilled workforce and become a forestry advocate who values lifelong learning. This conceptual model led to the creation of the research questions guiding this study.

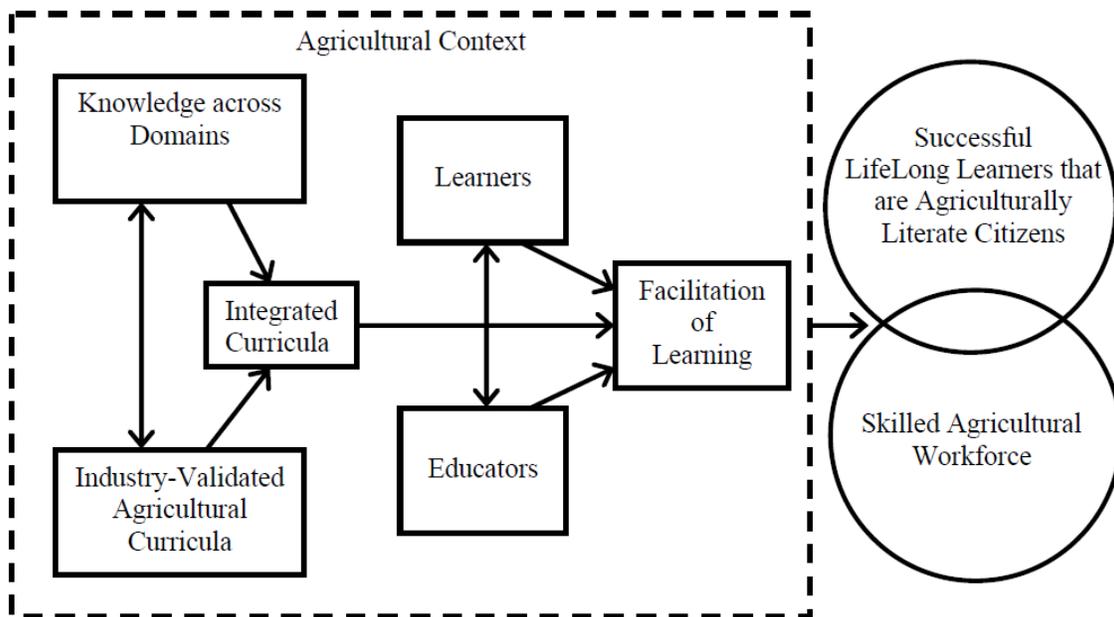


Figure 1. A conceptual model for teaching agriculture as a content and context (Roberts & Ball, 2009)

### Purpose and Objectives

According to the National Research Agenda the agricultural education profession must continue to examine the preparation of a sufficient workforce ready to address the challenging and complex problems of the 21<sup>st</sup> century. The purpose of this study was to examine the professional development needs of educators to teach forestry concepts in their classrooms in Georgia and Virginia. The research question posed to participants was “What are educators’ areas of concern with teaching forestry and forest ecosystems?” The objective that guided this study was to identify the professional development needs for educators to teach forestry and forest ecosystem content to secondary students.

### Methods

To collect the necessary data from teachers, the researchers used the Delphi method. The Delphi method has been used in a true (stakeholders meet in person) and in a modified (online

survey) format in agricultural education research (Franklin, 2011; Myers & Thompson, 2009; Robinson & Edwards, 2011; Rubenstein & Thoron, 2014). To collect stakeholder opinions, the Delphi method has been proven as an effective method (Landeta, 2006; Okoli & Pawlowski, 2004). Social scientists use focus groups as the qualitative tools for conducting this type of research (Sussman et al. 1991, Krueger and Casey 2008). Focus groups are facilitated in a way that increases participants' willingness to share ideas, thoughts, and concerns regarding the topic being discussed. Identifying the appropriate audience for this project was challenging because forestry is not typically included as a stand-alone class in the high school curriculum. Content about forests and forestry appears in agriculture and environmental science classes (Fuhrman et al., 2014; Lockerman Friend, 2008); therefore, we made teachers of these disciplines our subjects. Geographically, we examined teachers from the southeastern United States because this region has long served as the "woodbasket of the world" and is predicted to remain an important employment base for forestry into the future (Fox et al., 2004).

## **Participants**

A true Delphi method was used in this study allowing for the participants to meet face-to-face to share their thoughts and opinions on their professional development needs. The Delphi panel size should include a minimum of 4 people and that the panel's composition should depend on the expert's qualifications and demographics rather than a simple count (Thangaratinam and Redman, 2005). This study was conducted in two locations to ensure that teachers' concerns of different geographical areas were heard and recorded. Session one consisted of 6 panelists who were high school forestry teachers and state Department of Education administrators from Georgia. Session two consisted of 17 panelists who were educators, foresters, cooperative extension agent, and Career and Technical Education Directors from Virginia. All of the participants had teaching experience in the middle school, high school, or collegiate classroom. The participants had been in the education profession between six and 31 years. Each of the participants taught forestry or forestry ecosystem content as a portion of their courses. The researchers specifically selected each of the participants based on their level of experience and background to ensure that a thorough sample of the teaching profession was selected to create a robust list of concerns relevant to educators at all experience levels.

During the study, two participant groups were examined to investigate the diversity of thought held throughout the southeast region of the United States. Specifically, the need existed to include teachers from various geographical areas, because inservice teachers' professional development needs vary within the same state or between neighboring states (Washburn, King, Garton, & Garton, 2001). Therefore, the researchers in this study aimed to examine the differences of teaching forestry and forest ecosystems in two geographically different states of the southeastern region of the United States. In the state of Georgia all forestry content is taught primarily through agricultural education classes and by agricultural educators. However, in the Commonwealth of Virginia forestry education is taught by both science and agricultural educators, thus creating different needs for instruction. This study aimed to include all needs of educators to ensure that a diversity of professional development needs was captured in the study.

## **Data Collection**

The lead question was written for the group to see at the front of the room at the beginning of each information sharing session. To engage the participants in the discussion, the researchers composed the following lead question, “What are educators’ areas of concern with teaching forestry and forest ecosystems?”

The dialogue was led by a trained discussion leader who kept the conversation flowing and would ask appropriate probing questions to make sure each idea was clearly documented. During the discussion, a recorder typed each item mentioned into a word processing program, while a scribe wrote each item on large post-it sheets to be clearly visible to all research participants.

The purpose of a Delphi study is for the participants to reach consensus after the second or third round. The participants in each of the information sharing sessions reached consensus in two rounds. During the first round, participants were asked to respond to the lead question by sharing their ideas, without commenting on previous participants comments. At the end of the first round all of the items were compiled and each participant rated to each item, on an electronic device using a Qualtrics survey. Each item was rated using a Likert scale based on their belief/perceived level of importance that this item should be included in a professional development session on forestry and forest ecosystems. The Likert scale was as follows: 5= “essential”, 4= “very important”, 3= “somewhat important”, 2= “optional”, 1= “not needed”. At the end of each round the participants were given a report of the calculated mean scores. During the second round, participants were able to discuss the potential of adding new items, combining existing items, and removing items from the list. For items to be removed or combined the discussion leader would ensure that consensus was reached before taking any action on the item. At the end of the second round each participant was asked to rate each item again using the same Likert scale from round one. An *a priori* score was set at a mean of 4.0 for the professional development items to be considered in the final data reporting and professional development sessions. To standardize each panelist’s responses, the researchers used a z-score to create an index value for each item to establish the top areas of concerns by environmental and agricultural education teachers in Georgia and Virginia. The researchers due note a limitation to the use of z-scores in this study because of the small sample size in Session one ( $n=7$ ). However, due to the homogeneity of the participants, the researchers found a normal distribution in their responses deeming the use of z-scores effective.

## Findings

During Session one, the participants identified 48 professional development needs of teachers to effectively instruct students on forestry and forest ecosystems. Following round two, the panel narrowed the list to 27 items to reduce redundancies and eliminate items that had not reached consensus. Following the second round, the top four items were: tree diseases and disorders ( $M = 4.80$ ,  $SD = 0.45$ ), timber stand improvement/foundational knowledge ( $M = 4.60$ ,  $SD = 0.55$ ), forest management ( $M = 4.60$ ,  $SD = 0.55$ ), and FFA state forestry field exam ( $M = 4.60$ ,  $SD = 0.55$ ). At the end of the process, 14 items achieved a mean score above the *a priori* level of 4.0 (Table 1).

Table 1

*Round Two – Levels of Agreement to the Professional Development Needs in Forestry and Forest Ecosystems (Session One)*

Item	Mean	SD
Trees diseases and disorders	4.80	0.45
Timber stand improvement/foundational knowledge	4.60	0.55
Forest management	4.60	0.55
FFA state forestry field exam (match curriculum)	4.60	0.55
Maintenance and use of forestry equipment	4.40	0.89
Forestry equipment	4.40	0.55
GPS/GIS	4.20	0.45
Career opportunities in forestry	4.20	0.84
Regional differences in teaching forestry, pine vs. hardwood markets	4.00	1.00
Timber harvesting, sawmill, hydraulics,	4.00	1.22
Best management practices for forestry	4.00	0.00
Tree identification and collection of samples	4.00	0.71
How to teach forestry concepts that are not exact	4.00	1.22
FFA contest, regional differences	4.00	1.73

Note: Scale: 1 = Not Needed, 2 = Optional, 3 = Somewhat Important, 4 = Very Important, 5 = Essential.

During Session two, the participants compiled a list of 93 professional development needs to effectively teach forestry and forest ecosystems. At the end of the second round the needs had been reduced to 80 items by removing redundancies and those that received less than the *a priori* mean of a 4.0. The top four items on the list were: professional career speakers ( $M = 4.88$ ,  $SD = 0.33$ ), graduation requirements limit electives ( $M = 4.71$ ,  $SD = 0.47$ ), career counseling/job fairs in forestry ( $M = 4.71$ ,  $SD = 0.47$ ), educate students about degrees needed for forestry career ( $M = 4.71$ ,  $SD = 0.47$ ). At the conclusion of round two, 54 items received a mean average above the *a priori* level of 4.0 (Table 2).

Table 2

*Round 2 – Levels of Agreement to the Professional Development Needs in Forestry and Forest Ecosystems (Session 2)*

Items	Mean	SD
Professional career speakers	4.88	0.33
Graduation requirements limit electives	4.71	0.47
Career counseling/job fairs in forestry	4.71	0.47
Educate students about degrees needed for forestry careers	4.71	0.47
Over commitment of students to sports/vacation/jobs	4.71	0.59
Lack of background knowledge	4.65	0.86
Lack of forestry /agriculture programs in schools	4.65	0.61
Have forestry electives in middle school	4.65	0.61
Better community engagement by forestry professionals	4.59	0.62

Time management/proper instruction planning	4.53	0.51
Forestry/Environmental Science related clubs	4.53	1.01
High school internships with local conservation/forestry professionals	4.53	0.72
Lack of bus and transportation funding	4.47	0.72
Overall disconnect of students with the outdoors	4.47	0.87
Making forestry cross-curricular	4.47	0.51
Connection among elementary, middle, and high school curriculum	4.47	0.72
College-bound students not seen as who should be taking forestry classes	4.47	0.72
Reaching out to students on social media to educate about forestry	4.47	0.80
How to change negative public perception of forestry	4.41	1.00
Have Cooperative Extension agents visit classrooms	4.41	0.71
More time for teacher curricular planning	4.41	0.80
Reaching young kids to direct students towards forestry classes	4.41	0.80
Understanding the impact of local environmental issues	4.41	0.71
Administration doesn't value subject matter (forestry and forest ecosystems)	4.35	1.06
Lack of funding for student organizations/club activities	4.35	0.86
Connect learning standards to forestry content	4.35	0.79
Teachers from urban areas lack foundational knowledge	4.35	0.79
Lack of collaboration between Science and Ag Ed program in school	4.29	0.92
Administration viewing forestry as a lower level science	4.29	0.85
No forestry or agriculture classes offered at high school level	4.29	1.10
Grant opportunities	4.29	0.92
Connect forestry four-year degree programs with community colleges	4.29	0.59
Professional development for teachers across disciplines	4.29	0.92
More scholarships for forestry bachelor degrees	4.29	0.92
Students not interested in summer camps designed for forestry	4.29	0.77
Improve parental education about careers in forestry	4.29	0.77
Administrative removal of students from forestry classes for advising	4.24	0.83
Substitute teachers to allow teachers to plan/develop new materials	4.24	0.97
Better environmental education opportunities	4.24	1.03
Create state position to recruit and educate high school students in forestry	4.24	1.09
Increase forestry professionals on state curriculum review boards	4.19	1.05
Teacher stipend for students clubs	4.18	1.07
Increase state agencies funding for forestry education	4.18	1.07
Lack of forest teaching areas	4.12	1.05
Perceived lack of fit between learning standards and forestry	4.12	0.93
Administrative removal of student from forestry classes for remediation	4.12	0.86
Forestry/environmental science scholarships connected with science fairs	4.12	1.05
Push towards STEM - not connected well to forestry	4.12	0.99
Improve day care/after school programs outdoor education programing	4.06	1.06
Money to purchase teaching equipment	4.06	1.20
Middle and high school students make career choices late in program	4.06	1.03
Improve 4-H programs in forestry	4.06	0.90
Lack of connection between learning standards and forestry content	4.00	0.94

Note: Scale: 1 = Not Needed, 2 = Optional, 3 = Somewhat Important, 4 = Very Important, 5 = Essential.

From Sessions one and two, 107 items were reported by the participants of the information sharing sessions. At the conclusion of data collection, the results were compiled and a ranking of the z-scores identified the top 13 areas of concern from environmental and agricultural education teachers in Georgia and Virginia. The top five concern areas were: professional career speakers ( $z = 2.52$ ); graduation requirements limit electives ( $z = 1.70$ ); career counseling/job fairs in forestry ( $z = 1.70$ ); education students about degrees needed for forestry careers ( $z = 1.70$ ); and over commitment of students to sports/vacation/jobs ( $z = 1.70$ ).

Table 3  
*Professional Development Needs Ranked by Z-score Combined From Session 1 and 2*

<b>Item</b>	<b>Mean</b>	<b>SD</b>	<b>z-score</b>	<b>Session</b>
Professional career speakers	4.88	0.33	2.52	2
Graduation requirements limit electives	4.71	0.47	1.70	2
Career counseling/job fairs in forestry	4.71	0.47	1.70	2
Educate students about degrees needed for forestry careers	4.71	0.47	1.70	2
Over commitment of students to sports/vacation/jobs	4.71	0.59	1.70	2
Trees diseases and disorders	4.8	0.45	1.48	1
Lack of background knowledge	4.65	0.86	1.41	2
Lack of forestry /agriculture programs in schools	4.65	0.61	1.41	2
Have forestry electives in middle school	4.65	0.61	1.41	2
Timber stand improvement/foundational knowledge	4.6	0.55	1.23	1
Forest management	4.6	0.55	1.23	1
FFA state forestry field exam (match curriculum)	4.6	0.55	1.23	1
Better community engagement by forestry professionals	4.59	0.62	1.12	2

### **Discussion and Recommendations**

The educational needs identified by information sharing session participants can be divided into two overarching categories: changes to administrative constraints to the instruction of forestry and improving educators content knowledge of forestry. Session two was dominated by a discussion of administrative constraints on forestry education and Session one was dominated by a discussion of improving forestry educators content. These findings support the work of Washburn et al. (2001) who similarly identified that geographic and educational administrative differences influence teacher professional development needs.

The need for having a foundational knowledge of forestry concepts, supports the work of Lockerman Friend (2008) who identified instructor knowledge as a crucial factor to secondary instruction in forestry. The participants in the session provided specific content about what topics they felt were lacking in their own education, but which they were expected to teach in the classroom. There are two approaches for remedying this lack content knowledge: a general

forestry course could be added to undergraduate agricultural teacher preparation programs or continuing education learning session could be provided for inservice agriculture and environmental science teachers by forestry experts. Due to a constantly changing field, both solutions should be adopted by teacher educators and agricultural education state staff to provide preservice and inservice teachers with the content knowledge needed to adequately prepare students for a career in the forestry industry. These solutions do not need to be time intensive, but could be as simple as the cross disciplinary peer education model proposed by Copenheaver, Duncan, Leslie, and McGehee (2004), where undergraduates in forestry provided guest lectures in secondary agricultural education classes.

Session two participants focused their discussion on various administrative challenges that face them in the classroom as major areas of concern to teaching forestry content in their classes. Concerns about administrative challenges and school procedures have been voiced by many teachers as a reason for leaving the teaching profession (Skaalvik & Skaalvik, 2011). However, there is no easy remedy for this issue. Professional development has been found to increase teachers knowledge in forestry content areas (Velardi, Folta, Rickard, & Kuehn, 2015); however, there is a lack of evidence suggesting that professional development assists teachers with adapting to and overcoming administrative barriers.

Based on the findings of this study the following recommendations for further research are offered:

1. A needs assessment should be conducted to examine existing teacher confidence and familiarity with the professional development needs identified in this study to better prioritize the professional development opportunities;
2. Research should be conducted to examine preservice teacher confidence and familiarity with the professional development needs identified in this study so that teacher educators can better prepare preservice teachers; and
3. Research should be conducted to examine a larger geographic area to determine if forestry content concerns identified in this study match those in other geographic regions of the United States.

Based on the findings of this study the following recommendations for teacher education are offered:

1. Require each preservice teacher to complete an introductory forestry course to ensure that foundational knowledge is acquired;
2. Prepare professional development workshops with forestry experts to merge the content and pedagogy; and
3. Work with state CDE superintendents to ensure the standards being taught in forestry units/courses align with the various competitive events offered.

## References

- Barrick, R. K., Ladewig, H. W., & Hedges, L. E. (1983). Development of a systematic approach to identifying technical inservice needs of teachers. *Journal of the American Association of Teacher Educators in Agriculture*, 24(1), 13-19.
- Connaughton, K. (2015). Forestry employment trends. *Journal of Forestry* 113 (6), 571-573. doi: 10.5849/job.15-036
- Copenheaver, C. A., Duncan, D. W., Leslie, L. D., & McGehee, N. G. (2004). An exploratrion of cross-disciplinary peer education in natural resources. *Journal of Natural Resources and Life Sciences Education*, 33, 124-130. Retrieved from <https://www.agronomy.org/files/jnrlse/issues/2004/e04-0004.pdf>
- Darling-Hammond, L. (2006). Constructing 21st -century teacher education. *Journal of Teacher Education*, 57,1-15. doi: 101177/0022487105285962
- Fox, T.R., Jokela, E.J., & Allen, H.L. (2004). The evolution of pine plantation silviculture in the southern United States. (General Technical Report SRS-75). Asheville, North Carolina: U.S. Department of Agriculture, Forest Service, Southern Research Station. Chapter 8. p 63-82.
- Franklin, E. A. (2011). Greenhouse facility management experts identification of competencies and teaching methods to support secondary agricultural education instructors: A modified Delphi study. *Journal of Agricultural Education*, 52(4), 150-161. doi: 10.5032/jae.2011.04150
- Fuhrman, N.E., Morgan, A.C., Copenheaver, C.A., Peterson, J.A., Newberry, M.G., DeLoach, S.G., & van de Gevel, S. (2014). Repeated monitoring of forest plots: Evaluating the accuracy of student scientist data. *NACTA Journal* 58 (1-4), 95-101.
- Joerger, R.M. (2002). A comparison of the in-service education needs of two cohorts of beginning Minnesota agricultural education teachers. *Journal of Agricultural Education*, 43(3), 11-24.
- Krueger, R.A., and M.A. Casey. 2008. Focus groups: a practical guide for applied research. 4th ed. Sage Publications, Thousand Oaks, CA.
- Landeta, J. (2006). Current validity of the Delphi method in social science. *Technological Forecasting and Social Change*, 73, 467-782. doi: 10.1016/j.techfore.2005.09.002
- Lockerman Friend, K.R. (2008). *Attitudes and knowledge of forestry by high school agricultural education teachers in West Virginia*. (master's thesis). West Virginia University, Morgantown, West Virginia, USA.
- McCabe, S.M., Munsell, J.F., & Seiler, J.R. (2014). Forest field trips among high school science teachers in the southern Piedmont. *Natural Sciences Education*, 43 (1), 44-50. doi: 10.4195/nse2013.01.0001
- Munsell, J.F., McCabe, S.M., & Seiler, J.R. (2016). Forestry education in US Southern Piedmont high school science classes. *Journal of Forestry*, 114 (4), 441-448. doi: 10.5849/jof.14-137

- Myers, B. E., & Thompson, G. W. (2009). Integrated academics into agriculture programs: A Delphi study to determine perceptions of the National Agriscience Teacher Ambassador Academy participants. *Journal of Agricultural Education, 50*(2), 75-86. doi: 10.5032/jae.2009.02075
- Okoli, C., & Pawlowski, S. D. (2004). The Delphi method as a research tool: An example, design considerations and applications. *Information and Management, 42*, 15–29.
- Peake, J., Duncan, D., & Ricketts, J., (2007). Identifying Technical Content Training Needs of Georgia Agriculture Teachers. *Journal of Career and Technical Education, 23*(1), 44-55.
- Roberts, T. G., & Dyer, J. E. (2004). Characteristics of effective agriculture teachers. *Journal of Agricultural Education, 45*, 82-95. doi: 10.5032/jae.2004.04082
- Rouleau, M., Sharik, T.L., Whitens, S., & Wellstead, A. 2017. Enrollment decision-making in U.S. forestry and related natural resource degree programs. *Natural Sciences Education, 46*, 1-9. doi: 10.4195/nse2017.05.0007
- Rubenstein, E. D. & Thoron, A. C. (2014). The creation of a biofuels and sustainable agriculture post-secondary curriculum: A true-Delphi study. *Career and Technical Education Research, 39*(2), 171-184. doi: 10.5328/cter39.2.171
- Sharik, T.L., Lilieholm, R.J., Lindquist, W. & Richardson, W.W. (2015). Undergraduate enrollment in natural resource programs in the United States: Trends drivers, and implications for the future of natural resource professions. *Journal of Forestry, 113*(6), 538-551. doi: 10.5849/jof.14-146
- Skaalvik, E. M., & Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion. *Teaching and Teacher Education, 27*, 1029-1038. doi: 10.1016/j.tate.2011.04.001
- Sussman, S., D. Burton, C.W. Dent, A.W. Stacy, and B.R. Flay. 1991. Use of focus groups in developing an adolescent tobacco use cessation program: Collection of norm effects. *J. Appl. Soc. Psychol. 21*:1772–1782.
- Thangaratinam, S., & Redman, C. WE. (2005). The Delphi technique. *The Obstetrician and Gynaecologist, 7*, 120-125. doi:10.1576/toag.7.2.120.27071
- The National Council for Agricultural Education. (2015). *National AFNR content standards*. Retrieved from <https://thecouncil.ffa.org/afnr/>
- USDA Forest Service (2015). *USDA Forest Service Strategic Plan: FY 2015–2020. FS-1045*. USDA Forest Service, Washington, DC. Available at: <https://www.fs.fed.us/strategicplan/>; last accessed November 6, 2017.
- Velardi, S. H., Folta, E., Rickard, L., & Kuehn, D. (2015). The components of effective professional development for science educators: A case study with environmental

education program Project Learning Tree. *Applied Environmental and Communication*, 14(4), 223-231. doi: 10.1080/1533015X.2015.1109484

Washburn, S. G., King, B. O., Garton, B. L., & Harbstreit, S. R. (2001). The professional development needs of Kansas teachers of agriculture. *Proceedings of the AAAE Central Region Agricultural Education Research Conference*, 216-227. Retrieved from <https://eric.ed.gov/?id=ED475348>

**No Discussant Remarks**

# **I think I can!: Utilizing Goal Orientations and Academic Efficacy to Predict the Academic Performance of Freshmen College of Agriculture Students**

Olivia M. Soler, Louisiana State University  
Adam M. O'Malley, Louisiana State University  
Whitney L. Figland, Louisiana State University  
Morgan A. Richardson, Louisiana State University  
J. Joey Blackburn, Louisiana State University  
Kristin S. Stair, Louisiana State University  
Richie Roberts, Louisiana State University

## **Abstract**

*In 2015, the United States Department of Agriculture reported current agriculture baccalaureate graduates are only expected to fill two-thirds of the available job openings. In order to address this need, it is important for colleges of agriculture to retain high quality students. To assist in this retention effort, many Universities attempt to determine which best practices foster student success. This study aims to investigate goal orientation factors (i.e., mastery goal orientation and academic efficacy) that may influence the academic success (i.e., first semester GPA, second semester GPA) of College of Agriculture freshmen. This study is grounded in the goal orientation theory and social self-efficacy theory, which allowed us to understand the influence self-efficacy has on students overall academic pursuit and performance. The findings from this study suggest that social and academic efficacy have an effect on overall student academic achievement. Therefore, it is recommended that university practitioners make specific efforts to foster self-efficacy and future research be conducted on what variables describe the variance in first semester GPA and retention.*

## **Introduction**

According to the United States Department of Agriculture (USDA) current baccalaureate graduates in agriculture are only expected to fill 61% of the anticipated annual job openings within the field (Goecker, Smith, Fernandez, Ali, & Goetz, 2015). Further, "College graduates with expertise in food, agriculture, renewable natural resources, and the environment are essential to our ability to address the U.S. priorities of food security, sustainable energy, and environmental quality (Goecker et al., 2015, p. 1). In order to fulfill the demand within the agricultural workforce, it is important that colleges of agriculture recruit and retain high quality students. With many different factors being addressed in the literature, attempting to determine best practices to foster student success can be complex.

Universities dedicate substantial time and resources to ensure students are successful and retained from one year to the next (Tinto, 2006). For many universities, ensuring a student is retained is more cost effective and a better use of resources than focusing entirely on student recruitment. Further, student retention allows universities to focus on student success programming and other initiatives that collectively contribute to the success of the university system (Thomas, 2002). There are a variety of factors that influence the academic performance

and persistence of college students (Huff, Stripling, Boyer & Stephens, 2016; Tinto, 1993, 1999). One primary factor, however, is a students' ability and willingness to learn. Learning is a complex phenomenon that differs for each individual (Schunk, 2012). Schunk (2012) defined learning as "an enduring change in behavior [for an individual], or in the capacity to behave in a given fashion, which results from practice or other forms of experience" (Schunk, 2012, p. 3). Therefore, the learning process is influenced by a variety of factors, including the learner's (a) academic self-efficacy, (b) learning style, (c) goal orientation, and (d) environmental factors (Huff et al., 2016). As a consequence, determining academic success and persistence is complex, but an intimate understanding of such factors can significantly impact the success of a university's retention efforts (Tinto, 1998).

A common measure of academic success (i.e., academic performance) is college remedial status and grade point average (GPA) (Stewart, Lim, & Kim, 2015; Walsh & Robinson Kurpius, 2016). A student's academic performance is influenced by factors occurring both before and after entering college (Walsh & Robinson Kurpius, 2016). Tinto (1993) discussed several factors, both before and after entering college, that affect a students' persistence. An individual's background, such as their academic accomplishments prior to entering college, level of parental education, and family expectations can impact their success of integration (Tinto, 1993; Walsh & Robinson Kurpius, 2016). Even personal characteristics such as gender have shown to impact students' persistence once they enter college (Astin, 1975; Astin, Green, & Korn, 1987; Peltier, Laden, and Matranga, 1999; Reason, 2003; Stewart et al., 2015; Tinto, 1987). Other studies have shown students who had higher GPAs in high school performed better, academically, in college than those with a lower GPA in high school (Burgette & Magun-Jackson, 2008; Friedman & Mandel, 2009; Garton, Ball, & Dyer, 2002; Robinson & Garton, 2008). Although postsecondary institutions cannot adjust students' characteristics prior to enrollment, they can impact the students' college experience (Tinto, 1999).

The National Center for Education (2018) found only about 60% of individuals who enrolled in a four-year institution in 2010 earned their degree within six years. This indicates student attrition is an issue that institutions must address. Students are less likely to be committed to completing their college degree if they are not able to successfully integrate socially and academically into college (Tinto, 1993, 1998; Walsh & Robinson Kurpius, 2016). The integration process is particularly important for college freshmen (Tinto, 1993, 1998). Proper social and academic integration into the first year of college allows students to develop self-efficacy and a sense of belonging which, in turn, can influence academic performance and retention (Chemers, Hu, & Garcia, 2001). If universities are to assist in students' success, they must provide interventions and programming such as academic tutoring, academic advising, and counseling (Stewart et al., 2015).

Tinto (1999) identified four institutional conditions universities can improve to influence retention: (a) information/advice; (b) support; (c) learning; and (d) involvement. Students are more likely to persist if the institution provides consistent and clear information on academic and institutional requirements. This allows students to properly prepare and set realistic personal and academic goals. Universities can also increase success by ensuring various types of support programs are available (Tinto, 1999). This includes social, personal, and academic support in the form of tutoring, counseling programs, and academic advising (Stewart et al., 2015; Tinto,

1999). Next, institutions must improve the learning conditions for students. Often, this involves making learning activities more active and engaging, and providing various tutoring opportunities (Tinto, 1999). This means the more constructive interactions that students have with their peers and faculty, the more likely they are to persist (Tinto, 1998, 1999). Students who regularly participate in varied activities are more likely to develop connections with similar peers, which leads to improved student retention, personal development, and academic success (Zhao & Kuh, 2004). In order to provide an adequate supply of agricultural graduates, a better understanding of what factors impact student success within colleges of agriculture is warranted.

### **Theoretical Framework**

Goal theory was employed as the descriptive theoretical framework to guide this study (Schunk, 2016). Goal theory, described by Schunk (2016), synthesizes the work of numerous existing educational theorists involving student motivation (Anderman & Wolters, 2006; Blumenfeld, 1992; Elliot, 2005; Maehr & Zusho, 2009; Pintrich, 2000a, 2000b; Pintrich & Zusho, 2002; Schunk, 2016; Weiner, 1990). Goal theory “postulates that important relations exist among goals, expectations, attributions, conceptions of ability, motivational orientations, social and self-comparisons, and achievement behaviors” (Schunk, 2016, p. 374).

Goal theory builds upon previous research within student motivation with the application of goal orientations. Goal orientations are categorized as students’ motivation for engaging in academic tasks (Anderman, Austin, & Johnson, 2002; D’Lima, Winsler, & Kitsantas, 2014). The process of setting goals in regards to learning and performance can influence student academic performance (Dweck, 1991, 1999, 2002; Dweck & Leggett, 1988; Elliot & Dweck, 1988; Schunk & Meece, 2006; Schunk & Swartz, 1993a, 1993b). Specifically, learning goals explain what knowledge, behavior, or skills a student should acquire, while performance goals focus more on the successful completion of a particular task, such as a difficult assignment or project (Schunk, 2016).

Midgley et al. (1998) and Midgley, Kaplan, & Middleton (2001) developed additional concepts of goal orientations. This research describes a form of goal orientations similar to learning goal orientations, known as mastery goal orientations, which entails learning new skills, improving skills, understanding material, and developing abilities (Ames, 1992; D’Lima et al., 2014; Huff et al., 2016). Senko, Hulleman, and Harackiewicz (2011) explain mastery goal orientations, often used synonymously with learning goal orientations, are characterized by “meeting either task-based criteria (e.g., answering 80% of test problems correctly) or, more typically, self-defined criteria (e.g., feeling that you have learned or improved)” (p.27). Students who are mastery goal oriented typically have (a) stronger academic performance, (b) possess greater study skills, (c) explore related course topics, and (c) exceed teacher expectations (D’Lima et al., 2014; Huff et al., 2016; Senko & Miles, 2008).

### **Conceptual Framework**

Schunk (2016) provided a useful concept model to interpret the mechanisms of goal theory (see Figure 1). The model begins with the process of establishing learning goals, or mastery goals, and ultimately moves towards intended gains in achievement. Students actively pursuing a learning goal are likely to possess higher levels of self-efficacy. Self-efficacy refers to

an individual's perceived capabilities to learn or perform actions at designated levels (Bandura, 1977, 1986, 1993, 1997). Specifically, Bandura (1982) added educational self-efficacy, or academic self-efficacy, refers to an individual's confidence in his or her ability to perform an academic task. Students with higher academic efficacy are more likely to persist because they can better adjust to college, set higher academic goals, and thrive educationally (Walsh & Robinson Kurpius, 2016). Students are then more motivated to engage in self-regulating academic activities, which include tasks such as expending higher levels of effort and the increased use of highly effective learning strategies (Bandura, 1986; Schunk, 1995). Wentzel (1992) explained students' self-efficacy is then "reinforced as they observe their progress towards the goal" (p. 334). Honicke and Broadbent (2016) reported when a student's academic efficacy led to mastery goals adoption, the student was more likely to have a positive academic performance. Perceived progress in skill acquisition and self-efficacy for continued learning help to sustain a student's self-motivation and enhance skillful performance (Schunk, 1996).

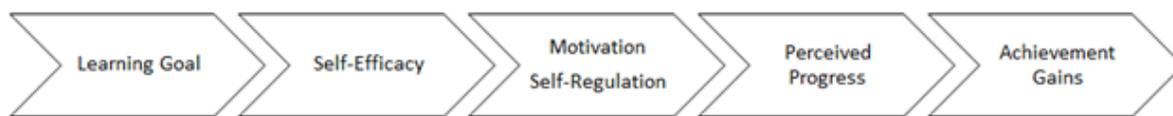


Figure 1. Effects of Learning Goals on Achievement

### Purpose and Objectives

The purpose of this study was to investigate goal orientation factors (i.e., mastery goal orientation and academic efficacy) that may influence the academic success (i.e., first semester GPA, second semester GPA) of College of Agriculture freshmen at [University]. This research supports the American Association for Agricultural Education's National Research Agenda Research Priority 3: Sufficient Scientific and Professional Workforce that addresses the challenges of the 21<sup>st</sup> century (Stripling & Ricketts, 2016). Specifically, this research aims to address Research Priority Question Four, "What methods, models, and programs are effective in preparing people to work in a global agriculture and natural resources workforce?" (p.31). The following objectives guided this study:

1. Describe the personal and educational characteristics (i.e. gender, age, ethnicity, home community size, first generation college student, residential status, retention status) of [University] COA freshmen who completed [Course] during the fall semester of 2017.
2. Describe the academic performance (i.e., first semester GPA and second semester GPA) by retention status of [University] COA freshmen students who completed [Course] during the fall semester of 2017
3. Describe the goal orientations of [University] COA freshmen students who completed [Course] during the fall semester of 2017.
4. Describe the academic efficacy of [University] COA freshmen students who completed [Course] during the fall semester of 2017.

5. Determine how selected demographic factors (i.e., gender, age, home community size, first generation college student, residential status), goal orientations, and academic efficacy predict academic performance (i.e., first semester GPA and second semester GPA) of [University] COA freshmen students who completed [Course] during the fall semester of 2017.

## Methods

The target population of this study consisted of all students enrolled in [Course] during the fall 2017 semester ( $N = 237$ ). Data were collected at the end of semester via Qualtrics online survey system by the researchers. A total of 211 students completed the survey, which yielded an 89% response rate. The instrument employed in this study was utilized by Midgley et al. (2000) to investigate patterns of adaptive learning. The entire instrument is comprised of sections that assessed (a) Personal Achievement Goal Orientations, (b) Perception of Teacher's Goals, (c) Perception of Classroom Goal Structures, (d) Academic-Related Perceptions, Beliefs, and Strategies, and (e) Perceptions of Parents, Home Life, and Neighborhood. The items were measured on a 5-Point Likert-type scale where 1 = *Not at all true of me*; 2 = *Slightly true of me*; 3 = *Somewhat true of me*; 4 = *Very true of me*; and 5 = *Extremely true of me*. For the purposes of this study, only data associated with two of the Patterns of Adaptive Learning Scales (PALS) scales are reported (a) Mastery Goal Orientation (Revised), and (b) Academic Efficacy. Midgley et al. (2000) reported reliability coefficients for the Mastery Goal Orientation ( $\alpha = .85$ ) and Academic Efficacy ( $\alpha = .78$ ) scales within the PALS instrument, therefore a pilot study was not conducted. For the current study, we calculated Cronbach's alpha, *post hoc*, and found acceptable reliability for the Mastery Goal Orientation ( $\alpha = .92$ ) and Academic Efficacy ( $\alpha = .92$ ) scales. Face and content validity were determined by one agricultural education faculty member and four agricultural education graduate students who were graduate assistants for the course. Further, Midgley et al. (1998) discussed the development and validation of the PALS instrument.

Data were analyzed utilizing SPSS version 26 for Macintosh. Descriptive statistics, including mean, frequency, and percentage were utilized to meet the needs for the first four research objectives. Stepwise multiple linear regression was employed for research objective five. This method of entry allows for a large number of individual predictors to be entered and variables are removed based on model fit (Field, 2009). Stepwise entry is appropriate for exploratory analyses when a sound theoretical basis for predictor entry is not available.

## Findings

The first research objective sought to describe the personal and educational characteristics of COA freshmen students enrolled in [Course] during the fall semester of 2017 (see Table 1). In all, the majority of our accessible population was female (74.4%) and 25.1% were male. Overall, the majority ( $n = 141$ ; 66.8%) were 18 years old, 68 (32.2%) responded they were 19 years old, and 1 (.05%) indicated his or her age as 20. Students were also asked to respond about their ethnicity. The majority of students responded to their ethnicity as being white ( $n = 165$ ; 78.2%), 26 (12.3%) students reported they were African-American, 10 (4.7%) students reported being multiracial, six (2.8%) students reported they were Hispanic, and four (1.8%) students reported they were Asian/Pacific Islander or did not respond, respectively. Regarding residential status, 94 (44.5%) lived on campus and were a part of the Agriculture

Residential College (ARC), 57 (27%) lived on campus but were not in ARC, 55 (26.1%) lived off campus, and 5 (2.4%) did not respond. The majority of students indicated they were not first generation college students ( $n = 153$ ; 72.5%), while 35 (16.6%) were first generation, 18 (8.5%) were unsure, and 5 (2.4%) did not respond. Regarding community size, 100 (47.4%) were from a small city, 53 (25.1%) were from an urban area, 29 (13.7%) were from a small town, 17 (8.1%) were from a rural town, and 7 (3.3%) were from a farm/ranch. Finally, regarding retention, 191 (90.5%) of students were retained to the second year at the University and 142 (67.3%) were retained within the College of Agriculture.

Table 1

*Personal and Educational Characteristics of Freshmen COA students enrolled in [Course] During the Fall Semester of 2017 (n = 211)*

Variable	<i>f</i>	%
<b>Gender</b>		
Male	53	25.1
Female	157	74.4
Did Not Respond	1	0.5
<b>Age</b>		
18 Years	141	66.8
19 Years	68	32.2
20 Years	1	0.5
Did Not Respond	1	0.5
<b>Ethnicity</b>		
African-American	26	12.3
Asian/Pacific Islander	2	0.9
Hispanic	6	2.8
Multiracial	10	4.7
White (Not Hispanic)	165	78.2
Did Not Respond	2	0.9
<b>Residential Status</b>		
On Campus, Agriculture Residential College (ARC)	94	44.5
On Campus, Not in ARC	57	27.0
Off-Campus	55	26.1
Did Not Respond	5	2.4
<b>First Generation College Student</b>		
Yes	35	16.6
No	153	72.5
Not Sure	18	8.5
Did Not Respond	5	2.4

Home Community Size		
Small Farm/Ranch	7	3.3
Rural, but not from a Farm/Ranch	17	8.1
Small Town (<5,000 residents)	29	13.7
Small City (5,000–50,000 residents)	100	47.4
Urban Area (>50,000 residents)	53	25.1
Did Not Respond	5	2.4
Retention		
Retained in [University]	191	90.5
Retained COA	142	67.3

Objective two sought to describe the first and second semester grade point averages (GPA) of freshmen students at Louisiana State University enrolled in [Course] by second year retention status. The overall mean of first semester GPA was 2.92 ( $SD = 0.79$ ). Students who left [University] had a mean first semester GPA of 1.94 ( $SD = 0.91$ ). Those students who remained at [University] but left the COA had a mean first semester GPA of 2.90 ( $SD = 0.72$ ) and those who remained in the COA had a mean first semester GPA of 3.06 ( $SD = 0.70$ ). The overall average second semester GPA was 2.90 ( $SD = 0.82$ ). Regarding those who left [University], the mean second semester GPA was 1.59 ( $SD = 0.99$ ). Those who were retained at [University], but left the COA had a mean second semester GPA mean of 2.80 ( $SD = 0.83$ ) and those who remained in the COA had an average GPA of 3.10 ( $SD = 0.76$ ).

Table 2

*First and Second Semester Grade Point Averages of Freshmen [University] students enrolled in [Course] During the Fall Semester of 2017 (n = 211)*

GPA	Minimum	Maximum	M	SD
First Semester Overall	0.16	4.25	2.92	0.79
Left [University]	0.16	3.21	1.94	0.91
Left COA; Retained at [University]	0.66	4.25	2.90	0.72
Retained in COA	0.41	4.24	3.06	0.70
Second Semester	0.00	4.28	2.90	0.82
Left [University]	0.00	3.15	1.59	0.99
Left COA; Retained at [University]	0.77	4.06	2.80	0.83
Retained in COA	0.00	4.28	3.01	0.76

*Note.* [University] grading scale includes A+ (4.30 GPA points)

Objective three aimed to describe the mastery goal orientations of freshmen students enrolled in [Course] during the fall 2017 semester (see Table 3). The overall mastery goal construct mean was 4.40 ( $SD = 0.65$ ) and fell within the real limits of *Very True of Me*. The highest rated individual item ( $M = 4.50$ ;  $SD = 0.64$ ) was *It's important to me that I improve my skills this year*.

This item's mean fell within the real limits of *Extremely True of Me*. The remaining items all had means within the real limits of *Very True of Me*.

Table 3

*Mastery Goal Orientations of Freshmen [University] students enrolled in [Course] During the Fall Semester of 2017 (n = 211)*

Item	Minimum	Maximum	M	SD
It's important to me that I improve my skills this year.	1	5	4.50	0.64
It's important to me that I thoroughly understand my schoolwork.	1	5	4.48	0.69
One of my goals in school is to learn as much as I can.	1	5	4.43	0.76
One of my goals is to master a lot of new skills this year.	1	5	4.33	0.86
It's important to me that I learn a lot of new concepts this year.	1	5	4.27	0.82
Master Goal Total			4.40	0.65

*Note.* Real Limits: 1.00–1.49 = *Not at all true of me*; 1.50–2.49 = *Slightly true of me*; 2.50–3.49 = *Somewhat true of me*; 3.50–4.49 = *Very true of me*; 4.50–5.00 = *Extremely true of me*

Research objective four sought to describe the academic efficacy of students enrolled in [Course] during the fall semester of 2017 (see Table 4). Overall, the academic efficacy scale had a grand mean of 3.90 ( $SD = 0.77$ ) and was in the real limits of *Very True of Me*. Similarly, all individual items in the academic efficacy scale had means within the real limits of *Very True of Me*.

Table 4

*Academic Efficacy of Freshmen [University] students enrolled in [Course] During the Fall Semester of 2017 (n = 211)*

Item	Minimum	Maximum	M	SD
I can do almost all of my schoolwork if I don't give up.	1	5	4.22	0.81
Even if the work is hard, I can learn it.	1	5	3.97	0.86

I can do even the hardest schoolwork if I try	1	5	3.90	0.93
I'm certain I can figure out how to do the most difficult schoolwork.	1	5	3.72	0.95
I'm certain I can master the skills taught in my classes this year.	1	5	3.72	0.87
<b>Academic Efficacy Total</b>			<b>3.90</b>	<b>0.77</b>

*Note.* Real Limits: 1.00–1.49 = *Not at all true of me*; 1.50–2.49 = *Slightly true of me*; 2.50–3.49 = *Somewhat true of me*; 3.50–4.49 = *Very true of me*; 4.50–5.00 = *Extremely true of me*

Objective six sought to determine how selected demographic factors (i.e., gender, age, home community size, first generation college student, residential status), goal orientations, and academic efficacy predicted academic success (i.e., first semester GPA and second semester GPA) of [University] COA freshmen students who completed [Course] during the fall semester of 2017. Regarding first semester GPA, the only predictor to enter the model was Academic Efficacy ( $\beta = 0.26$ ;  $p = 0.00$ ).

Table 5

*Stepwise Model of Selected Demographic Factors, Mastery Goal Orientations, and Academic Efficacy on First Semester GPA*

Predictor	$R^2$	$B$	$SE B$	$\beta$	$p$
Constant	-	1.93	0.30	-	-
Academic Efficacy	0.07	0.26	0.07	0.26	0.00

Similarly, academic efficacy ( $\beta = 0.19$ ;  $p = 0.01$ ) was the only statistically significant predictor to enter the model for second semester GPA.

Table 6

*Stepwise Model of Selected Demographic Factors, Mastery Goal Orientations, and Academic Efficacy on Second Semester GPA*

Predictor	$R^2$	$B$	$SE B$	$\beta$	$p$
Constant	-	2.08	0.34	-	-
Academic Efficacy	0.04	0.19	0.09	0.19	0.01

## Conclusions/Discussion

Regarding research objectives one and two, the majority of the students who participated in this research study were Caucasian females who were 18 years old. The majority of students also grew up in a small city, lived on campus, and were not first generation college students. The majority of students were retained in the university, however approximately one-third of the students changed majors out of the College of Agriculture before their second year. Overall,

students who were retained in the College of Agriculture into their second year had the highest first and second semester GPAs, while those who left [University] had the lowest GPAs.

Objective three aimed to describe the mastery goal orientations of [University] COA freshmen enrolled in [Course]. Overall, these students had high mastery achievement goal orientations, which indicates they desired to push themselves, academically, to seek and achieve (a) mastery, (b) understanding, and (c) competence (Midgley et al., 2000). Chemers et al. (2001) noted proper social and academic integration into the first year of college allows students become more self-efficacious and develop a sense of belonging, which influences academic performance. Overall, these findings are consistent with social self-efficacy theory stating that students who are actively pursuing a learning goal are more likely to possess higher levels of self-efficacy, which translates to better performance (Bandura, 1977, 1997; Schunk, 2016).

Further, objective four aimed to describe the academic efficacy of freshmen [University] COA students enrolled in [Course] during the fall semester 2017. In all, it was concluded that this group of students was efficacious regarding their ability to complete coursework (Midgley et al., 2000). Students with high levels of academic efficacy should be expected to persist when faced with academic challenges (Bandura, 1977, 1993, 1997). Further, Tinto (1993) and Walsh and Robinson Kurpius (2016) indicated students are less likely to be committed to completing their college degree and will have lower levels of efficacy they are not able to successfully integrate socially and academically into college. These findings are also consistent with previous research by Honicke and Broadbent (2016) who reported when a student's academic efficacy led to mastery goals adoption, the student was more likely to have a positive academic performance.

Objective five sought to determine how selected demographic factors, goal orientations, and academic efficacy predicts academic success (i.e., first and second semester GPAs). Academic efficacy was the only statistically significant factor that entered the regression models for first and second semester GPA. However, academic efficacy explained only a small percentage of the variance in both first and second semester GPAs. Interestingly, the results of this study indicate no predictive ability of whether or not a student is a first generation college student. Prior research has suggested first-generation students make less progress academically (Billson & Terry 1982; & Pascarella, Pierson, Wolniak, & Terenzini, 2004; Pike & Kuh, 2005). However, this study is consistent with Inman and Mayes (1999) and Strage (1999) who found no difference in academic achievement between first and non-first generation students. Furthermore, these findings are consistent with Schunk (2016) and Bandura (1977), which indicated the more self-efficacious students are; the more likely they will have higher mastery goal orientations and academically perform better, regardless of other characteristics.

### **Recommendations**

Further research is needed to determine factors that influence students' academic performance and retention at the university and college levels. Additional factors, such as high school GPA and standardized test scores should be obtained to determine if or how they influence the predictive power of academic efficacy. Further statistical analysis should be employed to determine the roles of demographic factors, mastery goal orientations, and academic success on second year retention. Descriptive data show a large difference in first semester GPA

between those who stayed in the College of Agriculture and those who left the university. More robust statistical analysis may shed light into why students leave the university or change majors out of the COA. Qualitative inquiry may also be useful to develop a deeper understanding of factors that lead to academic success and retention. Perhaps the students in this study have been immersed into all facets of University life, which has helped foster a heightened sense of academic efficacy.

Based on this research, it is recommend that university practitioners make efforts to assist students to succeed academically and improve their confidence during their first semester in college. Further, academic departments should consider sequencing coursework in a manner that will boost students' academic efficacy. Specifically, first year students should be advised to enroll in courses that offer them a high chance of success. Further, this may involve improving interventions and resources, such as academic tutoring and counseling. It should also be communicated to students that their confidence in their academic work influences their GPA. Even though academic efficacy only explains a small portion of GPA variance, a powerful message to students is that their mental state and confidence in their abilities can make a difference in their academic performance.

Further research should also be conducted to determine, specifically, which programs may help to increase College of Agriculture student self-efficacy. Identifying which practices most impact student success could assist universities in specifically providing those opportunities within their programs. Because of the significant need in filling the demand for agriculture graduates, it is imperative that successful retention programming be included in College of Agriculture programs. Developing activities that spark agriculture student interest and keep them engaged with the College may help to keep these students retained. The development of student self-efficacy programming should be a priority of Colleges of Agriculture since it contributes to student academic success.

Because of the critical need to help engage students within their first year, intentionally developing activities that foster academic efficacy should be incorporated in introductory courses when possible. At [University], the vast majority of freshmen agriculture students take a one-credit seminar course their first semester. Classes such as this provide excellent opportunities to provide resources, introduce university programming, and build student self-efficacy. Because there is such an extensive literature base on the importance of providing resources and support to retain students, colleges of agriculture that do not currently have an introductory level course may wish to explore this as an option, or focus on developing these areas through introductory departmental coursework.

## References

- Ames, C. (1992). Motivation and achievement in adolescence: A multiple goals perspective. *Student perceptions in the classroom: Causes and consequences* (pp. 327–348). Hilldale, NJ: Lawrence Erlbaum.

- Anderman, E. M., & Wolters, C. A. (2006). Goals, values, and affects: Influences on student motivation. *Handbook of educational psychology* (2nd ed., pp. 369–389). Mahwah, NJ: Erlbaum.
- Anderman, E. M., Austin, C. C., & Johnson, D. M. (2002). The development of goal orientation. *Development of achievement motivation* (pp. 197–220). San Diego: Academic Press.
- Astin, A. W. (1975). *Preventing students from dropping out*. San Francisco: Jossey-Bass.
- Astin, A., Green, K. C., & Korn, W. S. (1987). *The college freshman: Twenty year trends*. Los Angeles: Higher Education Research Institute.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American psychologist*, *37*(2), 122–147. doi: 10.1037/0003-066X.37.2.122
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of social and clinical psychology*, *4*(3), 359–373. doi: 10.1521/jscp.1986.4.3.359
- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, *28*, 117–148. doi: 10.1207/s15326985ep2802\_3
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Billson, J. M., & Terry, M. B. (1982, January). *In search of the silken purse: Factors in attrition among first-generation students*. Annual meeting of the Association of American Colleges, Denver.
- Blumenfeld, P. C. (1992). Classroom learning and motivation: Clarifying and expanding goal theory. *Journal of Educational Psychology*, *84*, 272–281. doi: 10.1037/0022-0663.84.3.272
- Burgette, J. E., & Magun-Jackson, S. (2008). Freshman orientation, persistence, and achievement: A longitudinal analysis. *Journal of College Student Retention: Research, Theory & Practice*, *10*(3), 235–263. doi: 10.2190/CS.10.3.a
- Chemers, M. M., Hu, L. T., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology*, *93*(1), 55. Retrieved from <https://eric.ed.gov/?id=EJ638726>
- D’Lima, G. M., Winsler, A., & Kitsantas, A. (2014). Ethnic and gender differences in first-year college students’ goal orientation, self-efficacy, and extrinsic and intrinsic motivation. *The Journal of Educational Research*, *107*(5), 341–356. doi: 10.1080/00220671.2013.823366

- Dweck, C. S. (1991). Self-theories and goals: Their role in motivation, personality, and development. *Nebraska Symposium on Motivation, 1990* (Vol. 38, pp. 199–235). Lincoln, NE: University of Nebraska Press.
- Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. Philadelphia: Taylor & Francis.
- Dweck, C. S. (2002). The development of ability conceptions. *Development of achievement motivation* (pp. 57–88). San Diego: Academic Press.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*(2), 256. doi: 10.1.1.583.9142
- Elliot, A. J. (2005). A conceptual history of the achievement goal construct. *Handbook of competence and motivation* (pp. 52–72). New York: Guilford Press.
- Elliott, E. S., & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology, 54*, 5–12. doi: 10.1037/0022-3514.54.1.5
- Friedman, B. A., & Mandel, R. G. (2009). The prediction of college student academic performance and retention: Application of expectancy and goal setting theories. *Journal of College Student Retention: Research, Theory & Practice, 11*(2), 227–246. doi: 10.2190/CS.11.2.d
- Garton, B. L., Ball, A. L., & Dyer, J. E. (2002). The academic performance and retention of college of agriculture students. *Journal of Agricultural Education, 43*(1), 46–56. doi: 10.5032/jae.2002.01046
- Goecker, A. D., Smith, E., Fernandez, J. M., Ali, R., & Goetz, R. (2015). Employment opportunities for college graduates in food, agriculture, renewable natural resources, and the environment: United States, 2015–2020. Retrieved from: <https://www.purdue.edu/usda/employment/wp-content/uploads/2015/04/2-Page-USDA-Employ.pdf>
- Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational Research Review, 17*, 63–84. doi: 10.1016/j.edurev.2015.11.002
- Huff, S. M., Stripling, C. T., Boyer, C., & Stephens, C. A. (2016). Investigating factors that influence achievement goal orientation and educational practices in undergraduate agricultural sciences and natural resource students. *NACTA Journal, 60*(4). Retrieved from <https://www.nactateachers.org/index.php/volume-60-number-4-december-2016/2472>
- Inman, W. E., & Mayes, L. (1999). The importance of being first: Unique characteristics of first generation community college students. *Journal of Education Policy, 17*(4), 423–442. Retrieved from <https://eric.ed.gov/?id=EJ608548>
- Maehr, M. L., & Zusho, A. (2009). Achievement goal theory: The past, present, and future. *Handbook of motivation at school* (pp. 77–104). New York: Routledge.

- Midgley, C., Kaplan, A., & Middleton, M. (2001). Performance-approach goals: Good for what, for whom, under what circumstances, and at what cost? *Journal of Educational Psychology*, 93(1), 77–86. doi: 10.1037//0022-0663.93.1.77
- Midgley, C., Kaplan, A., Middleton, M., Maehr, M.L., Urdan, T., Anderman, L.H., Anderman, E., & Roeser, R. (1998). The development and validation of scales assessing students' achievement goal orientations. *Contemporary Educational Psychology*, 23, 113–131. doi: 10.1006/ceps.1998.0965
- Midgley, C., Maehr, M. L., Hruda, L. Z., Anderman, E., Anderman, L., Freeman, K. E., Gheen, M., Kaplan, A., Kumah, R., Middleton, M. J., Nelson, J., & Roeser, T. (2000). *Manual for the patterns of adaptive learning scales*. University of Michigan. Retrieved from [http://www.umich.edu/~pals/PALS%202000\\_V13Word97.pdf](http://www.umich.edu/~pals/PALS%202000_V13Word97.pdf)
- National Center for Education, U.S. Department of Education. (2018). National center for education statistics (NCES 2018-144). Retrieved from <https://nces.ed.gov/pubs2018/2018144.pdf>
- Pascarella, E. T., Pierson, C. T., Wolniak, G. C., & Terenzini, P. T. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *The Journal of Higher Education*, 75(3), 249–284. Retrieved from <https://eric.ed.gov/?id=EJ703795>
- Peltier, G. L., Laden, R., & Matranga, M. (1999). Do high school athletes succeed in college: A review of research. *The High School Journal*, 82(4), 234–238. Retrieved from <https://eric.ed.gov/?id=EJ713679>
- Pike, G. R., & Kuh, G. D. (2005). First-and second-generation college students: A comparison of their engagement and intellectual development. *The Journal of Higher Education*, 76(3), 276–300. doi: 10.1080/00221546.2005.11772283
- Pintrich, P. R. (2000a). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92, 544–555. doi: 10.1037/0022-0663.92.3.544
- Pintrich, P. R. (2000b). The role of goal orientation in self-regulated learning. In M. Boekaerts, P.R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451–502). San Diego: Academic Press.
- Pintrich, P. R., & Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 249–284). San Diego: Academic Press.
- Reason, R. D. (2003). Student variables that predict retention: Recent research and new developments. *Naspa Journal*, 40(4), 172–191. doi: 10.2202/1949-6605.1286
- Robinson, J. S., & Garton, B. L. (2008). An assessment of the employability skills needed by graduates in the college of agriculture, food and natural resources at the university of missouri. *Journal of Agricultural Education*, 49(4), 96–105. doi: 10.5032/jae.2008.04096

- Schunk, D. H. (1995). Self-efficacy and education and instruction. In *Self-efficacy, adaptation, and adjustment* (pp. 281-303). Springer, Boston, MA.
- Schunk, D. H. (1996). Goal and self-evaluative influences during children's cognitive skill learning. *American Educational Research Journal*, 33(2), 359–382. doi: 10.3102/00028312033002359
- Schunk, D. H. (2012). *Learning theories an educational perspective sixth edition*. Boston, MA: Pearson.
- Schunk, D. H. (2016). *Learning theories: An educational perspective* (7th. ed.). Boston, MA: Pearson.
- Schunk, D. H., & Meece, J. L. (2006). Self-efficacy development in adolescence. In F. Pajares, & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents*, 5, (pp. 71–96). Greenwich, CT: Information Age Publishing
- Schunk, D. H., & Swartz, C. W. (1993a). Goals and progress feedback: Effects on self-efficacy and writing achievement. *Contemporary Educational Psychology*, 18, 337–354. doi: 10.1006/ceps.1993.1024
- Schunk, D. H., & Swartz, C. W. (1993b). Writing strategy instruction with gifted students: Effects of goals and feedback on self-efficacy and skills. *Roeper Review*, 15, 225–230. doi: 10.1080/02783199309553512
- Senko, C., & Miles, K. M. (2008). Pursuing their own learning agenda: How mastery-oriented students jeopardize their class performance. *Contemporary Educational Psychology*, 33(4), 561–583. doi: 10.1016/j.cedpsych.2007.12.001
- Senko, C., Hulleman, C.S. & Harackiewicz, J.M. (2011) Achievement goal theory at the crossroads: Old controversies, current challenges, and new directions. *Educational Psychologist*, 46(1), 26–47. doi: 10.1080/00461520.2011.538646
- Stewart, S., Lim, D. H., & Kim, J. (2015). Factors influencing college persistence for first-time students. *Journal of Developmental Education*, 38(3), 12. Retrieved from <https://eric.ed.gov/?id=EJ1092649>
- Strage, A. A. (1999). Social and academic integration and college success: Similarities and differences as a function of ethnicity and family educational background. *College Student Journal*, 33(2), 198–198. doi: 10.1177/2158244018785412
- Thomas, L. (2002). Student retention in higher education: the role of institutional habitus. *Journal of Education Policy*, 17(4), 423–442. doi: 10.1080/02680930210140257
- Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. IL: University of Chicago Press.
- Tinto, V. (1993). Building community. *Liberal Education*, 79(4), 16–21. Retrieved from <https://eric.ed.gov/?id=EJ479696>

- Tinto, V. (1998). Colleges as communities: Taking research on student persistence seriously. *The Review of Higher Education*, 21(2), 167–177. Retrieved from <https://eric.ed.gov/?id=EJ557144>
- Tinto, V. (1999). Taking retention seriously: Rethinking the first year of college. *NACADA Journal*, 19(2), 5–9. doi: 10.12930/0271-9517-19.2.5
- Tinto, V. (2006). Research and practice of student retention: What next? *Journal of College Student Retention: Research, Theory & Practice*, 8(1), 1–19. doi: 10.2190/4YNU-4TMB-22DJ-AN4W
- Walsh, K. J., & Robinson Kurpius, S. E. (2016). Parental, residential, and self-belief factors influencing academic persistence decisions of college freshmen. *Journal of College Student Retention: Research, Theory & Practice*, 18(1), 49–67. doi: 10.1177/1521025115579672
- Weiner, B. (1990). History of motivational research in education. *Journal of Educational Psychology*, 82, 616–622. doi: 10.1037/0022-0663.82.4.616
- Wentzel, K. R. (1992). Motivation and achievement in adolescence: A multiple goals perspective. In D. H. Schunk, & J. L. Meece (Eds.), *Student perceptions in the classroom* (pp. 287–306). Hillsdale, NJ: Erlbaum.
- Zhao, C. M., & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in higher education*, 45(2), 115–138. Retrieved from <http://www.aabri.com/manuscripts/09346.pdf>

**No Discussant Remarks**

## **Leadership Development Program Satisfaction: An Evaluation of the Role of Leader Member Exchange**

Kevan W. Lamm, University of Georgia  
Kerry L. Priest, Kansas State University

### **Abstract**

*Today's agricultural leaders face complex challenges. On a global scale, pressing issues around land use, food production and security, natural resource management, energy consumption, and climate change drive the need for systemic, innovative, collaborative solutions. For over four decades, adult agricultural leadership programs have represented an intentional investment in fostering leadership development and community participation in response to changing needs of rural and agricultural communities. The current study sought to investigate the role of leader member exchange (LMX) between leadership program participants with their program directors and the satisfaction participants had with their program experience. Through regression analysis LMX was found to be a statistically significant predictor of program satisfaction. Therefore, a recommendation is for program directors, and leadership educators more generally, to be cognizant of not only the content of programs, but also of the relationships they are forming with participants throughout a leadership development program.*

### **Introduction**

Today's agricultural leaders face complex challenges. On a global scale, pressing issues around land use, food production and security, natural resource management, energy consumption, and climate change drive the need for systemic, innovative, collaborative solutions (Andenoro, Baker, Stedman, & Weeks, 2016). Organizational tensions between production and innovation create increasingly dynamic and demanding work environments (Uhl-Bien & Arena, 2018). Civic engagement is in decline, while experiences of disenfranchisement and mistrust among political and business leaders and constituents continues to rise (Levine, 2013).

Leaders are needed who can think systemically, operate in uncertainty, enable organizations and people for adaptability, and engage publics deliberatively and collaboratively (Levine, 2013; Petrie, 2014; Uhl-Bien & Arena, 2018). According to research by the Center for Creative Leadership, in order to develop capacities for a dynamic and changing world, leadership education and training programs must create the conditions for (1) disruptive learning experiences; (2) engagement with colliding perspectives (different people, worldviews, opinions, etc.), and (3) elevated sense-making through a process of intentional coaching and critical reflection (Petrie, 2015). A research priority area seven of the *National Research Agenda: American Association for Agricultural Education 2016 – 2020* (Roberts, Harder, & Brashears, 2016) is, "What methods, models, and programs are effective in preparing people to solve complex, interdisciplinary problems?" (p. 59). Andenoro et al. (2016) suggest that the development of this capacity must extend beyond formal classrooms and engage multiple stakeholders.

For over four decades, adult agricultural leadership programs have represented an intentional investment in fostering leadership development and community participation in response to changing needs of rural and agricultural communities (Kelsey & Wall, 2003). More specifically, programs have served to build leader identity, efficacy, and capacity of individuals within the agricultural and natural resource industry to “accept leadership responsibility in any part of society” and develop understanding of multiple viewpoints and situations (Whent & Leising, 1992, p. 32).

Despite this long history, there remains a lack of published research on adult rural leadership development (Kaufman & Rudd, 2006). Much of the existing literature on agricultural leadership programs contextualize participants as “leaders” and seeks to describe variables such as demographics and program satisfaction, as well as perceptions of knowledge and skills gained, behavioral change, levels of community involvement, or other impacts (e.g., Diem & Nikola, 2005; Kelsey & Wall, 2003; Lamm, Lamm, & Carter, 2014; Shauber & Kirk, 2001). This is consistent with wider scholarship that conceptualizes leadership as an individual level skill, and *leader development* as training of individuals with knowledge and skills (Day, 2000). It is also a widely held assumption among leadership development programs that that “individual-level changes will lead to organization-level, system level, and societal-level outcomes” (Guitierrez & Tasse, 2007, p. 53).

Graen and Uhl-Bien (1995) suggest the need to shift the focus in leadership research from a leader (or follower)-centric view to leadership *relationships*. Indeed, leadership development (as opposed to leader development) has been conceptualized as a collective endeavor – expanding an organization, work group, or community’s capacity to engage together in leadership tasks for collective work (McCauley & Velsor, 2004).

The need to attend to leadership relationships within agricultural leadership development programs is reinforced by the very structure and intent of the programs. Kaufman, Rateau, Ellis, Kasperbauer, and Stacklin, (2010) suggest agricultural leadership programs align closely with “grassroots” leadership programs. Casciani (2003) describes how grassroots leadership development programs are a significant investment in long-term learning. Program designers therefore, should give special attention to relational interventions that meet community leaders where they are at, and acknowledge their special role as leaders in community change. Kaufman, Rateau, Carter and Strickland’s (2012) study of agricultural programs found that the average length was 21 months, delivered through a variety of strategies (i.e., field experiences, lectures, classroom activities, panels, readings, and technology). Program directors play a significant role that includes program planning, fundraising, administrative tasks, and recruitment.

Re-framing agricultural leadership programs through a relational lens positions program directors as “leaders” in dyadic relationships with program participants. Of interest, then, is the nature of these relationships: how they form, the quality of the relationship, and the impact of the relationship on program outcomes. Meaningful, engaged learning in all environments is one of the priority areas of the *National Research Agenda: American Association for Agricultural Education 2016 – 2020* (Roberts, et al., 2016). Within the context of the priority area, one of research priority questions is “What are the most effective models for delivering agricultural teacher education programs to reach nontraditional audiences?” (Roberts et al., 2016, p.39).

Examining the relationship between learner program satisfaction and learner perceptions of their relationship with the program director will illuminate how nontraditional audiences are effectively served.

## Theoretical Framework

### Leader-Member Exchange

The leader-member exchange (LMX) theory of leadership is supported by over three decades of research. (Graen & Uhl-Bien, 1995). Early studies (Stage 1) discovered that managers within organizations did not use an average leadership style, but operated through differentiated dyadic relationships with direct reports. These vertical dyadic linkages (VDLs) were characterized by the behavior of the manager or supervisor (leader), as described by both the leader and follower. Relationships were considered “high quality exchanges” (originally called “in group” referring to relationships based on expanded and negotiated role responsibility) or “low-quality exchanges” (originally called “out-group” referring to relationships based on formal employment contract) (Graen & Uhl-Bien, 1995; Northouse, 2013).

Later stages of research shifted the focus of LMX away from the differences between groups, to understanding the characteristics of LMX relationships, and organizational outcomes (Graen & Uhl-Bien, 1995). The unit of analysis shifted from leader to the dyadic relationship. Studies helped to describe a dyadic role-making processes, characteristics of followers in high LMX relationships, and confirmed and further described characteristics of differentiated relationships between leaders and followers as *mutual trust, respect, and obligation*. LMX is based on characteristics of working relationships as opposed to personal or friendship relationship, and trust, respect, and mutual obligation refer to the individual’s assessments of each other in terms of their professional capabilities and behaviors (Graen & Uhl-Bien, 1995). LMX has been linked to job performance, job satisfaction, and organizational commitment, among other outcomes (Gerstener & Day, 1997).

An evolution of LMX is a shift toward emphasizing *leadership-making*, exploring not only on how managers distinguish among their people but how they work with each person on a one-on-one basis to develop a partnership with them (Graen & Uhl-Bien, 1995). Leadership is viewed as a partnership, and the assumption is that leaders should develop high-quality exchanges with all followers, not only a few. Effective leadership making is a developmental process in which relationships move from (1) stranger to (2) acquaintance to (3) mutual partnership (Graen & Uhl-Bien, 1991). Leaders and followers first relate to each other first based on formal or prescribed roles through low-quality exchanges (e.g., transactional, motivated by self-interest). As the leader or follower make “offers” or work-related social-exchanges (e.g., sharing more resources, information), the relationship develops and shared goals form. Increasing quality of exchanges over time leads to the development of mutual levels of trust, respect, and obligation, and reciprocal influence (e.g., transformational behaviors, motivated by shared purpose) (Graen & Uhl-Bien, 1995).

Applying LMX to agricultural leadership programs, participants who feel like partners (in high quality exchanges) with program directors may be more willing engaging in activities beyond what is required, take more personal and professional risks, and engage in more

challenging learning environments – all which support the kinds of development required to face contemporary leadership challenges.

### **Program Satisfaction**

Kirkpatrick's (1994) levels of evaluation is widely used in exploring outcomes of leadership training programs. These levels include (1) reaction, the measure of satisfaction to the program, (2) learning, to what extent change in knowledge, skills, or attitudes occurred, (3) behavior, to what extent on-the-job behavior changed, and (4) results, the extent at which results have occurred because of the training or program.

Measuring at the reactions level is essential to all training programs because it lets participants know that program leaders value their perspectives, as well as provides measurable reactions, and suggestions for improvement (Kirkpatrick & Kirkpatrick, 2005). Program satisfaction is an important measure because it determines whether or not participants will attend a program again, or recommend training to others. Success at higher levels depend on success at lower levels of evaluation. For example, "behavior change does not happen if learning has not occurred and it is unrealistic to expect learning to occur if steps have not been taken to create a positive learning environment" (2005, p. 58)

### **Purpose & Research Questions**

The purpose of this study was to examine how adult agriculture and natural resource (ANR) leadership development program participants' perceptions of their program director, as measured by leader member exchange, influenced their program satisfaction. The study was driven by the following research objectives:

1. Describe the levels of LMX perceptions among alumni and current participants of ANR leadership development programs.
2. Describe the levels of program satisfaction among alumni and current participants of adult leadership development programs.
3. Identify the relationship between LMX and ANR leadership development program satisfaction in program alumni and current participants.
4. Identify how LMX predicts ANR leadership development program satisfaction in program alumni and current participants.

### **Methods**

A descriptive and correlational research design was employed to address the research objectives. Data were collected through an online survey administered to alumni and current participants of ANR leadership development programs. The data analyzed in the present study capitalize on data collected in the Lamm, Carter, and Lamm (2016) sample. The current study extends the work in two important ways. First, only programs within the southern United States that were directly managed through state Cooperative Extension programs were analyzed previously, in the current study the Southern programs (eight) are subsumed and analyzed in the complete program data set (28) to provide a more comprehensive set of data for analysis. Second, program satisfaction data were analyzed as a proposed measure of program evaluation specific to environment according to Bandura's social learning theory (1977). The current study

extends this analysis to treat program satisfaction as a variable of interest. These disclosures are presented based on recommendations within the literature for clarity (Kirkman & Chen, 2011).

### **Data Collection, Procedures, and Data Analysis**

Data were collected as part of a comprehensive the International Association of Programs for Agricultural Leaders (IAPAL) evaluation effort to identify ANR leadership development program alumni and current member experiences, satisfaction, characteristics, and intent to participate in future ANR leadership development alumni programs. A census approach was employed and included ANR leadership development programs that were active in the IAPAL organization. A census was conducted to provide the most comprehensive representation of ANR leadership development program alumni and current participants (Ary, Jacobs, & Sorensen, 2010). The data were also collected in a purposive manner to include programs that shared common characteristics based on their IAPAL affiliation. This was deemed to be acceptable as purposive data “can produce reliable results since bias is contained even in severely heterogeneous populations” (Guarte & Barrios, 2006, p. 284).

Of the 41 programs listed in the IAPAL directory a total of 28 agreed to participate. Data were collected in the spring of 2014 using an online questionnaire developed in Qualtrics. Respondents were contacted using the tailored design method (Dillman, Smyth, & Christian, 2008). Invitations were sent to 7,152 potential respondents, a total of 1,182 individuals completed the questionnaire for a response rate of 16%. Based on established social science response rates, this was considered acceptable for analysis (Baruch & Holtom, 2008). An important note regarding response rate is that only individuals that provided both program satisfaction and LMX were included for analysis in the study. There were individuals that provided a program satisfaction response but did not provide LMX data. Nonresponse analysis was conducted by comparing early and late respondents based on the recommendations of Lindner, Murphy, and Briers (2001), no statistically significant difference were observed.

Respondents were asked to self-report their sex, race/ethnicity, and age. For the purposes of the study respondent race and ethnicity were defined as self-perceived membership in population groups that define themselves by cultural heritage, language, physical appearance, behavior, or other characteristics (“Standards”, 1995, p. 26). Specifically, as it relates to ethnicity individuals were asked if they considered themselves to be Hispanic/Latino(a)/Chicano(a) (e.g., Mexican, Puerto Rican). Individuals that selected *Yes* were coded as 1 ( $n = 19$ ), individuals that selected *No* were coded as 0 ( $n = 1170$ ). As it relates to race, individuals were asked what category best described their race. The White category was analyzed, individuals that selected *Yes* were coded as 1 ( $n = 1125$ ), individuals that selected *No* were coded as 0 ( $n = 42$ ). Individuals were asked to provide the year they were born, age was calculated accordingly. A range of ages between 26 and 92 were observed ( $M = 51.01$ ,  $SD = 11.18$ ). Lastly, individuals were asked to self-report they sex. Individuals that selected *Male* were coded as 0 ( $n = 738$ ), individuals that selected *Female* were coded as 1 ( $n = 433$ ).

### **Measures**

Program satisfaction was measured based on respondent self-reported program satisfaction using a researcher-adapted scale developed by Judge, Boudreau, and Bretz (1994).

Previously the scale has been found to have a Cronbach's  $\alpha$  of .85. The three-item scale assesses individual satisfaction (*yes* = 1, *no* = 0), how the individual typically felt about the program (1 = *least satisfied* to 5 = *most satisfied*), and finally percent of time satisfied (0% - 100%). An overall index value is calculated by multiplying the three scores. Scores on the overall satisfaction construct ranged from zero to five. For example, an individual that indicated they were satisfied with the project team on the first question was coded as a one, if the individual then selected the least satisfied option the second question was coded as a one, in the final question if the individual indicated that they were satisfied with their program 20% of the time this was used as the final value. The index calculation would then be 1 x 1 x .20 or 0.20.

To measure LMX, a researcher adapted version of the Graen & Uhl-Bien (1995) LMX instrument was used. The scale included seven items. In researcher adaptation of the instrument included replacing the term *leader* with *program director* in each question stem. A Cronbach's  $\alpha$  of .89 was calculated for the current study.

## Results

### LMX

Levels of LMX in ANR LDP alumni were calculated using the Graen & Uhl-Bien (1995) scoring key. LMX scale scores are based on a 1 to 5 scale. The LMX scale index had a minimum score of 1.00 and maximum score of 5.00 ( $M = 3.67$ ,  $SD = .68$ ). Table 1 displays individuals' LMX perception.

Table 1

*Participant-Perceived Level of LMX by Percentage of Respondents*

<i>Statements</i>	<i>n</i>	<i>Strongly Disagree %</i>	<i>Disagree %</i>	<i>Neither Agree or Disagree %</i>	<i>Agree %</i>	<i>Strongly Agree %</i>
I know where I stood with my program director... I usually knew if s/he was satisfied with what I did.	1124	1.16	4.18	13.97	60.41	20.28
My program director understood my job problems and needs.	1117	2.42	7.07	26.50	49.60	14.41
My program director recognized my potential.	1119	1.61	4.11	18.86	50.67	24.75
Regardless of how much formal authority my program director had built into his/her position, s/he would	1119	2.86	9.12	41.91	35.21	10.90

use his/her power to help me solve problems in my work.						
Regardless of the amount of formal authority he or she has, my program director would “bail me out” at his/her own expense.	1116	6.81	19.53	48.30	20.61	4.75
I have enough confidence in my program director that I would defend and justify his/her decision if s/he were not present to do so.	1119	1.70	5.00	20.91	50.40	21.98
I would characterize my working relationship with my program director as very effective.	1116	1.61	5.02	20.70	50.63	22.04

### Team Satisfaction

Levels of project team satisfaction in adult ANR LDP alumni were calculated using the Judge, Boudreau, and Bretz (1994) scoring key. Program satisfaction scale scores are based on a 0 to 5 range. The project team satisfaction scale index had a minimum score of 0 and maximum score of 5.00 ( $M = 3.96$ ,  $SD = 1.15$ ). Table 2 displays frequency of respondents based on satisfaction with their program, 4.2% ( $n = 49$ ) of individuals were not satisfied with their program. Table 3 displays frequency of respondents feeling toward their program. Individuals’ feeling toward their program had a minimum score of 1 and a maximum score of 5. Respondents indicated the percentage of time that they were satisfied with their program. Percentage of time satisfied ranged from a minimum of 0% to a maximum of 100% ( $M = 87.13\%$ ,  $SD = 13.23\%$ ).

Table 2

*Number of Respondents by Satisfaction With Program*

Satisfied with Program	<i>f</i>	%
No	49	4.20
Yes	1118	95.80
Total	1167	100.00

Table 3

*Number of Respondents by Feeling About Project Team*

Feeling about Project Team	<i>f</i>	%
Very Dissatisfied	6	0.54
Dissatisfied	14	1.25
Neither Satisfied nor Dissatisfied	32	2.85
Satisfied	362	32.29
Very Satisfied	707	63.07
Total	1121	100.00

### Relationships between LMX and Program Satisfaction

Pearson product-moment correlations between LMX, program satisfaction, age, gender, ethnicity, and race were completed to illuminate the nature of the relationship between variables. Correlation coefficients and statistical significance between variables are provided in Table 4. Correlations ranged from negligible to moderate in magnitude (Davis, 1971). LMX had a positive moderate correlation ( $r = .39$ ) with program satisfaction. The relationship was statistically significant at the  $p < .01$  level.

Table 4

#### *Intercorrelations Between LMX, Program Satisfaction, Age, Gender, Ethnicity, and Race*

	1	2	3	4	5	6
1. LMX	-					
2. Program Satisfaction	0.39**	-				
3. Age	-0.01	-0.02	-			
4. Gender	-.10**	0.01	-.13**	-		
5. Ethnicity	0.00	-.05	-0.03	0.04	-	
6. Race	0.05	.03	-0.04	0.05	-.13**	-

\*\*  $p < .01$

### LMX Predicting Program Satisfaction

Multiple regression analysis was completed to determine whether a predictive relationship existed between LMX and program satisfaction. Program satisfaction was treated as a dependent variable. LMX was treated as the independent variable of interest and demographic characteristics were treated as control variables.

Unstandardized regression coefficients in the form of variable level effects along with statistical significance are provided in Table 5. In Model 1 program satisfaction was regressed against the demographic control variables of age, gender, ethnicity and race. The omnibus model was not statistically significant ( $R^2 = .00$ ,  $F(4,994) = .34$ ,  $p = .85$ ). No demographic variables were statistically significant predictors of program satisfaction. In Model 2 the variable

of LMX was included. Adding LMX as a predictor variable in the model is associated with a statistically significant increase in  $R^2$  ( $\Delta R^2 = .15$ ,  $F(1,993)= 171.67$ ,  $p < .001$ ). Furthermore, LMX is a statistically significant predictor of program satisfaction.

Model level variance ( $R^2$ ), changes in  $R^2$  between models, changes in  $F$  statistics, and significance of  $F$  statistic changes between models were calculated and are provided in Table 6. Model 1 explained 0% of the variance in program satisfaction. The difference between Model 1 and Model 2 was statistically significant. Model 2 accounted for 15% of the variance in program satisfaction.

Table 5

*Multiple Regression of Program Satisfaction on LMX and Demographic Characteristics*

	Model 1	Model 2
<i>Constant</i>	3.96***	1.59***
<i>Demographic Characteristics</i>		
Age	0.00	0.00
Gender	-0.03	0.07
Ethnicity	-0.23	-0.20
Race	0.10	0.03
<i>LMX</i>		0.64***

\*\*\* $p < .001$

Table 6

*Hierarchical Regression of Program Satisfaction on LMX and Demographic Characteristics*

Variable Entered	$R^2$	$R^2$ Change	$F$ Change	Sig. of Change
Demographic Characteristics	0.00	0.00	0.34	0.85
Demographic Characteristics & LMX	0.15	0.15	171.67	0.00

**Conclusions, Recommendations, and Implications**

Leadership development programs have been criticized for a lack of evaluative rigor and accountability (Kellerman, 2012). One of challenges associated with evaluating ANR leadership development programs has been a lack of consistency in what constitutes appropriate evaluation outcomes and impacts. However, based on recommendations within the literature (Lamm et al.,

2016), the purpose of this study was to not only provide a measure of program satisfaction, but also an analysis of the antecedent conditions that are related to levels of satisfaction.

Within the context of ANR leadership development programs, all programs share a similar structure, specifically, that participants are guided through a series of seminars, or educational experiences, by a program director (Kaufman et al., 2012). However, the nature of the relationship between program directors and participants has not been previously examined. Using the LMX questionnaire (Graen & Uhl-Bien, 1995) the results of the study indicate that overall, participants in ANR leadership development programs have a strong, positive perception of their program director. An implication of this result is that program directors are generally doing a good job of engaging with participants and demonstrating an understanding of participant needs, responsibilities, and expectations.

These results are further supported by the results of the program satisfaction analysis. The majority of respondents were satisfied with their ANR leadership development program experience. The use of an index measure, as opposed to a single item, lend additional validity to these observed results.

Despite the generally high levels of observed LMX and program satisfaction one of the main contributions of this study is the analysis of the relationship between these two variables. To ensure the analysis was rigorous the inclusion of demographic, proximal, control variables was included (Keith, 2006). The results of the study indicate that there were no correlations between the demographic variables of age, gender, ethnicity, and race and program satisfaction. This result implies that programs are generally providing an experience that is satisfactory to a variety of individuals. Similarly, the relationship between LMX and demographic variables was also examined. A statistically significant relationship between gender and satisfaction was observed. Based on the coding of the variable the result indicated that there was a negative relationship between gender and LMX, specifically, individuals that self-reported as female tended to have a lower score than those that self-reported as male. Based on this result a recommendation would be to further examine whether gender of program directors has any influence on the relationship between LMX and participant gender.

After analyzing the results descriptively and from a correlational perspective, a regression analysis was conducted. Within the two-step regression model the first step was intended to further investigate the nature of the relationship between the demographic variables and program satisfaction. In particular, to determine if a statistically significant predictive relationship existed. The results further illuminated the correlational observations. When analyzed, none of the demographic variables had a statistically significantly predictive of program satisfaction. An implication from this result is that gender, nor any other demographic variable, was predictive of program satisfaction, therefore programs appear to be providing an equally satisfactory experience for participants. After controlling for proximal demographic variables in the first step of the regression model LMX was included in the second step. The results are noteworthy in that the model including LMX accounted for 15% of the variance in program satisfaction. Based on this result a recommendation is for ANR leadership development program directors to be very intentional in their relationships with participants. This finding implies that it is not only the

content that is delivered, the peers that are involved, and other programmatic variables, but also the relationship with the program director that determines participant satisfaction

Although the results of the study are informative there are limitations that must be acknowledged. First, the response rate, while acceptable given web-based data collection, is low. There is the possibility that results may be biased based on respondents opting to participate or not. Additionally, results should be interpreted within the context under which data were collected, particularly, 28 of 41 programs opting to participate in the study. Generalizations therefore should be limited to the participating programs.

From a practical perspective a recommendation is for program directors to collect LMX data proactively from participants periodically throughout a program experience. At a minimum a suggestion would be to collect data when the program is 1/3 and 2/3 over. Collecting data at these intervals will allow for the natural dynamics of the program and group to emerge, while also allowing program directors sufficient time to adjust as appropriate. The use of an independent evaluator may facilitate this process as program participants may be reluctant to provide honest responses directly to a program director (Rossi, Lipsey, & Freeman, 2004).

Additional research is recommended to replicate the observations of the current study within other leadership development programs, whether formal or non-formal. Further exploration of the dynamics between leadership educators and learners should be conducted. For example, while this study focused on Stage 2 (the influence of LMX relationships on the outcome of program satisfaction), program directors are well served to consider the ways in which they engage in dyadic partnership building and leader-making (Stage 3). Additionally, research into other additional relationships between ANR leadership development program participant characteristics and program outcomes such as satisfaction should be explored.

To enable meaning, engaged learning in all environments, educators, including ANR leadership development program directors, must be cognizant of the impact they can have on program participants. The use of LMX as a predictor of program satisfaction should provide further evidence of the importance of the educator and learner relationship. Additionally, shifting toward a relational framework for leadership development provides new lenses to explore and experiment with curricular interventions that support leadership for a complex and changing world.

## References

- Andenoro, A. C., Baker, M, Stedman, N. L., & Weeks, P. (2016). Research priority 7: Addressing complex problems. In T. G. Roberts, A. Harder, & M. T. Brashears, M. T. (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020* (pp. 57-62). Gainesville, FL: Department of Agricultural Education and Communication.
- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education*. Belmont, CA: Wadsworth Cengage Learning.

- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, N.J.: Prentice-Hall.
- Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61*(8), 1139-1160. doi:10.1177/0018726708094863
- Casciani, C. (2003). Developing grassroots leaders: What's the different? A funder/practitioner view. In *Grassroots leadership development: A guide for grassroots leaders, support organizations, and funders* (pp. 12-14). Battle Creek Michigan: W. K. Kellogg Foundation.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- Day, D. V. (2000). Leadership development: A review in context. *Leadership Quarterly, 11*(4), 581-613.
- Diem, K. G., Nikola, M. P. (2005). Evaluating the impact of a community agricultural leadership development program. *Journal of Extension, 43*(6). Retrieved from <https://www.joe.org/joe/2005december/rb5.php>
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (Eds.). (2008). *Internet, mail, and mixed-mode surveys: The tailored design method* (2nd ed.). Hoboken, N.J.: Wiley & Sons, Inc.
- Gerstner, C.R. & Day, David. (1997). Meta-analytic review of leader-member exchange theory: Correlates and construct issues. *Journal of Applied Psychology, 82*. 827-844. doi: 10.1037//0021-9010.82.6.827.
- Graen, G. B., & Uhl-Bien, M. (1991). The transformation of professionals into self-managing and partially self-designing contributors: Toward a theory of leadership-making. *Journal of Management Systems, 33*(3), 25-39.
- Graen, G. B., & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *The Leadership Quarterly, 6*(2), 219-247. doi: 10.1016/1048-9843(95)90036-5
- Guarte J.M. & Barrios, E.B. (2006). Estimation under purposive sampling. *Communications in Statistics-Simulation and Computation, 35*(2), 277-284. doi: 10.1080/03610910600591610
- Guitierrez, M., & Tasse, T. (2007). Leading with theory: Using a theory of change approach for leadership development evaluations. In K. M. Hannum, J. W. Martineau, and C. Reinelt (Eds.), *The Handbook of Leadership Development* (pp. 48-70). San Francisco: John Wiley & Sons, Inc.
- Judge, T. A., Boudreau, J. W., & Bretz, R. D. (1994). Job and life attitudes of male executives. *Journal of Applied Psychology, 79*(5), 767-782. doi:10.1037/0021-9010.79.5.767

- Kaufman, E. K., & Rudd, R. D. (2006). Rural leadership development: A synthesis of research. *Journal of Leadership Education*, 5(3), 128-141.
- Kaufman, E. K., Rateau, R.J., Ellis, K. C., Kasperbauer, H. J. Stacklin, L. R. (2010). Leadership program planning: Assessing the needs and interests of the agricultural community. *Journal of Leadership Education*, 9(1), 122-143.
- Kaufman, E. K., Rateau, R. J., Carter, H., & Strickland, R. (2012). What's context got to do with it? An exploration of leadership development programs for the agricultural community. *Journal of Leadership Education*, 11(1), 121-139.
- Keith, T. Z. (2006). *Multiple regression and beyond*. Boston, MA: Pearson
- Kellerman, B. (2012). *The end of leadership*. New York, NY: HarperCollins.
- Kelsey, K. D., & Wall, L. J. (2003). Do agricultural leadership programs produce community leaders? A case study of the impact of an agricultural leadership program on participants' community involvement. *Journal of Agricultural Education*, 44(4), 35-46.  
doi:10.5032/jae.2003.04035
- Kirkman, B.L. & Chen, G. (2011). Maximizing your data or data slicing: Recommendations for managing multiple submissions from the same data set. *Management and Organization Review*. 7, 3, 433-446. doi: 10.1111/j.1740-8784.2011.00228.x
- Kirkpatrick, D. L. & Kirkpatrick, J. D. (2005). *Transferring learning to behavior: Using the four levels to improve performance*. San Francisco: Berrett-Koehler
- Kirkpatrick, D. L., (1994). *Evaluating training programs: The four levels*. San Francisco: Berrett-Koehler.
- Lamm, K. W., Carter, H. S., & Lamm, A. J. (2016). Evaluating extension based leadership development programs in the southern United States. *Journal of Agricultural Education*, 57(1), 121-136. doi: 10.5032/jae.2016.01121
- Lamm, K. W., Lamm, A. J., & Carter, H. S. (2014). Opinion leadership development: context and audience characteristics count. *Journal of Agricultural Education*, 55(2), 91-105.  
doi:10.5032/jae.2014.02091
- Levine, P. (2013). *We are the ones we have been waiting for: The promise of civic renewal in America*. Oxford, UK: Oxford University Press.
- Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53. doi:10.5032/jae.2001.04043
- McCauley, C. D., & Velsor, E. V. (Eds.). (2004). *Center for creative leadership handbook of Leadership Development* (2nd ed.) (pp. 1-22). San Francisco: Jossey-Bass.

- Northouse, P. G. (2013). *Leadership: Theory and practice* (6th ed.). Thousand Oaks: Sage Publications.
- Petrie, N. (2014). *Vertical development-part 1: Developing leaders for a complex world* (White paper). Greensboro, NC: Center for Creative Leadership. Retrieved from <https://www.ccl.org/wp-content/uploads/2015/04/VerticalLeadersPart1.pdf>
- Petrie, N. (2015). *The How-To of Vertical Leadership Development–Part 2: 30 Experts, 3 Conditions, and 15 Approaches (White Paper)*. Greensboro, NC: Center for Creative Leadership. Retrieved from <https://www.ccl.org/wp-content/uploads/2015/04/verticalLeadersPart2.pdf>
- 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.
- Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach*. Thousand Oaks, CA: Sage.
- Schauber, A. C., Kirk, A. R. (2001). Impact of a community leadership program on the volunteer leader. *Journal of Extension*, 39(3). Retrieved from <https://www.joe.org/joe/2001june/rb2.php>
- Standards for the classification of federal data on race and ethnicity. (1995). Retrived from [http://www.whitehouse.gov/omb/fedreg\\_race-ethnicity/](http://www.whitehouse.gov/omb/fedreg_race-ethnicity/)
- Uhl-Bien, M., & Arena, M. (2018). Leadership for organizational adaptability: A theoretical synthesis and integrative framework. *The Leadership Quarterly*, 29(1), 89–104. <https://doi.org/10.1016/J.LEAQUA.2017.12.009>
- Whent, S., & Leising, J. (1992). A twenty -year evaluation of the California agricultural leadership program. *Journal of Agricultural Education*, 15(3), 32-39.

## Discussant Remarks

### Leadership Development Program Satisfaction: An Evaluation of the Role of Leader Member Exchange

Discussant: Bill Weeks, Professor, Oklahoma State University

Leadership Member Exchange or LMX is an underutilized and mostly underappreciated leadership model that focuses on not what the leader does, not who the leader is, but the relationship the leader has with followers. The model stresses that the leader has a unique relationship with each follower. The model has intuitive value as we have all experienced being in the leader's "in group" or "out-group". The in-group enjoys more time with the leader, special communication, and shared insight. If you are in the out-group, you are perceived to be dis-loyal, lazy, and/or untrustworthy. Many believe that LMX model represents how the world really works and advises leaders to try to get everyone (to believe they are) in their in-group. It has practical value in that regard, as it is prescriptive; it tells leaders how to lead.

In this paper, the authors attempt to see if the leader (program director) has a positive relationship with followers (participants in a leadership development program) as evidenced by a high LMX score and examine the relationship with their overall satisfaction with the program. The authors secured participation from 28 of the 41 statewide agricultural leadership programs, an impressive feat itself. Attempting to contact over 7,000 current participants in the 28 programs, they achieved a 16% response rate. All of us are to blame for this response rate as we delete unfamiliar emails, refuse to answer our phone, and trash anything that looks like junk mail.

Some questions to consider:

- While 95% of the respondents indicated they were satisfied with the program, the very low response rate (as the authors note) causes some concern. Are those who were not satisfied as likely to respond as those who responded? Should we care?
- If LMX describes a unique relationship between a leader and a follower, how can we pool our data with 28 different program directors and 7000 participants? Would it be more appropriate to report data on the 28 different directors and their relationship with the participants in their program? Could data be gathered locally?
- There is some evidence that females scored their leader (program director) lower than did male participants. Did those responses come from programs with a female or male director? Does it matter?
- Why do the authors suggest that LMX data be gathered at a minimum of three times over the course of the program? Do they recommend teaching LMX theory to program participants as part of the leadership education part of the leadership development program?

## Undergraduate Goal Setting: Analyzing Personality as a Predictor

Kevan W. Lamm, University of Georgia  
Emana Sheikh, University of Florida  
Don Edgar, University of Georgia

### Abstract

*Although the importance of goal setting for students is well established in the literature and the utility of personality as reliable antecedents of different outcomes is similarly well established, there are a limited number of studies that analyze the relationship between these two sets of variables, particularly within learning environments. The current study is intended to contribute to this area by analyzing goal setting and personality in undergraduate students enrolled in a leadership development course. Incorporating differences among individuals, which includes differences in personality to predict goal setting, will aid educators in recognizing links between persons of similar, or differing, personalities. The results of the study indicate that of the Big Five personality factors (Openness, Conscientiousness, Extraversion, Agreeableness, Emotional Stability), the factor of Agreeableness and Conscientiousness were related to student project level and class level goals. However, when regressed simultaneously only Agreeableness was a statistically significant predictor of goals.*

### Introduction

Every step of the human life requires that people set goals and act accordingly in order to achieve them. Meeting these goals is highly dependent on the content of these goals and how one chooses to *self-regulate* these goal-oriented actions (Gollwitzer & Mosowitz, 1996). The term *self-regulate* can be defined as altering one's responses (actions) in order to align with set standards (Fiske, Gilbert, & Lindzey, 2010). Consequently, it is important to stress the *self*-element of actions and the performance of personality influencing one to select, regulate, and meet identified goals.

Understanding of personality has been sought for eons. The investigation about the cogency of personality scales as predictors for self-selections is not a new area of study (Barrick & Mount, 1991). Theories referencing understanding one's self, which trace back to Plato and Aristotle, describe a driving force different to that of other species. The human race is compelled by emotion and personality-based perspectives that ultimately influence our decisions. Through rationalist theories, scholars and experts have created models to direct proper leadership, goal setting, and motivation strategies. Therefore, scholars set goals: to emphasize cognition and rationality (Muchinsky, 2000) while minimizing the influences caused by emotion driven behaviors (Ashforth & Humphrey, 1995). Therefore, the search for knowledge must be done in a self-regulated environment to ensure the attained goals are not influenced through personal bias.

The relationship between goal setting processes and personality poses a significant area for study and further insight. Discriminately, it is clear that external factors and constraints (i.e.,

social and organization factors) shape goal setting. Further, it is also significant to recognize the factors and constraints that originate from internal sources, which includes personality (Lord, Diefendorff, Schmidt, & Hall, 2010). In recent times the validity of personality as a predictor for goal setting and performance has been found to be classified as low. It has been suggested that the absence of a well-organized taxonomy for recognizing different personality traits is a possible reason for the low concrete evidence to establish a relationship between personality and performance (Barrick & Mount, 1991).

Although the importance of goal setting for students is well established in the literature (e.g. Schunk & Zimmerman, 2007), and the utility of personality as reliable antecedents of different outcomes (e.g. Barrick & Mount, 1991) is similarly well established, there are a limited number of studies that analyze the relationship between these two sets of variables, particularly within learning environments. Research priority area four of the National Research Agenda specifically identifies the need for meaningful, engaged learning in all environments (Roberts, Harder, & Brashears, 2016). The current study is intended to contribute to this area by analyzing goal setting and personality in undergraduate students enrolled in a leadership development course. Incorporating differences among individuals, which includes differences in personality to predict goal setting, will aid educators in recognizing links between persons of similar, or differing, personalities.

### **Theoretical Framework**

The theoretical framework guiding this investigation is based on the Five Factor Theory of Personality and further mitigated through goal setting strategies. The effects of personality factors predicting goal selection in undergraduate leadership students will frame the contextual nature of this study. Understanding the roles of the factors and their impacts is imperative to further understand how individuals view the *self*-element towards action and performance.

#### **The Five-Factor Model of Personality**

The five-factor model has gained much recognition as a classification system for the plethora of traits that characterize individuals of the human race. The five-factor model can at times be mistaken as a limited, five-word list to describe a seemingly endless list of personality traits. However, the purpose of the model serves to create structure, and rather to be used as an organized inventory to the more than 15,000 personality-trait adjectives that make up the English language (Goldberg, 1990). Though the model is versatile in its utility for studies, it not yet a universally accepted model for personality classification (e.g. Eysenck, 1992). Still, the model is a generally accepted and utilized reference tool for personality classification and scaling (Goldberg et al., 2006).

The five-factor model is comprised of the following factors: agreeableness, conscientiousness, extraversion, openness, and neuroticism. Costa and McCrae (1992) provided a description of each of these personality factors, which is referenced in this study. Openness is characterized by inventiveness, creativity, and curiosity and is often the most difficult to recognize (Barrick & Mount, 1991). Conscientiousness describes a balance between

dependability and persevering qualities (i.e. hardworking and achievement oriented) (Barrick & Mount, 1991). Surgency is frequently used to describe extraversion and personality elements including activeness, talkativeness, and assertiveness (Barrick and Mount, 1991). Agreeableness is explained through trust, cooperativeness, and good-naturedness mixed with compliance, tolerance and friendliness (Judge & Bono, 1990; Barrick & Mount, 1991). Anxiousness, anger, and insecurity characterize personality factor neuroticism and is the opposite of the emotional stability (Barrick & Mount, 1991). In this study neuroticism is scored through the opposite emotional stability scale.

McCrae and Costa (1991) found that individuals with high scores on measures of neuroticism lacked self-esteem and self-confidence. Individuals with high levels of surgency has been related to those who emerge as leaders in groups (Watson & Clark, 1997). Furthermore, individuals associate conscientiousness as a trait respected as a leader who exhibits positive job performance (Barrick & Mount, 1991). Conversely, individuals who display openness contain divergent thinking capacity (McCrae, 1987) and may not be viewed as conventional in their leadership role but their creativity may allow for change to occur when conscientious personalities would continue with a status quo schedule. Individuals who hold agreeableness as a trait are often described as generous and concerned for others (Judge & Bono, 2000). All of the big five personalities hold qualities which are differentiated between each other. To some extent, many individuals exhibit levels of each with some being more dominant in their individual personality characteristics. When evaluating female leaders in academia, researchers found that they held personality traits such as agreeableness, surgency, and conscientiousness, (Kleihauer, Stephens, Hart, and Stripling, 2013). The personality trait exhibited will influence how individuals work to define and set goals then in what manner they are attained. It is important to understand than when discussions are being held, if they are tuned towards individuals' personality(ies) engagement is more readily held even when the content is not consistent with their perspective (Lamm, Carter, Stedman, & Lamm, 2014).

### **Goal Setting and Goal Selection**

It is important that individuals have goals and determine processes to attain set goals. Goal setting and goal selection comprises a set of “processes involved in attaining and maintaining (i.e., keeping regular) goals, where goals are internally represented (i.e., within the self) desired states” (Vancouver & Day 2005, p. 158). When goals are internally represented, individuals are able to think through the process of goal attainment. The ideas that essentially center on goal setting are that people set goals, track their progress with said goals, and accordingly adjust their behaviors (Karloly, 1993). Thereby when goals are processed by the individually towards attainment or not being attained, adjustments are made.

We can think of goal setting almost as an input-output system, whereby the relationship between an input, reference goal, comparable progress, and output all interdependently play during the processes of goal setting (Carver & Scheier, 1998). These variables are influenced and controlled by the *self*. Individuals choose to change behaviors as output variables if negative feedback shows a discrepancy between set goals and progress (Lord et al., 2010). This process should be ongoing and adjusts made when necessary.

When conceptualizing goal setting, the general approach assumes an additional “hierarchical structure” which is framed by: short-term goals, lower-level concrete goals, long-term goals, and higher-level abstract goals (Lord et al., 2010). This structure allows individuals to process less information towards whether they have attained, not attained or are in-progress towards a goal. Furthermore, lower-level goals are assumed as the foundation to which higher-level goals are reached (Lord & Levy, 1994). When individuals set different levels of goals, it is easier for them to process “small” steps in the process of long-range goal attainment. This is essentially the “structure” behind the model of goal setting and selection versus the content of the goal or its preceding behavior (Diefendorff & Lord, 2008).

### **Personality as a Predictor for Goal Setting and Selection**

The study of goal setting and selection is of special interest to researchers especially in the professional work environment. When thinking about goal setting, it is not particularly the goal itself researchers are focused on but the *process* in which individuals come to selecting goals and accordingly adjusting behaviors to reach them.

When conceptualizing goal setting and personality collectively, a significant process in goal setting includes the internalization of set goals towards ones’ self. This process can span from a single goal to a multitude of goals at the same the time (Schmidt & DeShon, 2007). This internalization to self induces a set of emotional and behavioral processes. Because performance is heavily dependent on conscious and cognitive processes (Newell, 1990), personality psychology provides researchers a foundation to better understand the kinetics behind goal setting and selection systems and their development from a more intrapersonal process (Lord et al., 2010). Thus, the effects of personality towards goal setting and attainment are interdependent on the individual.

As mentioned, the self and goal setting share a rich connection. From literature, the network of structures in the brain allow for introspection (Raichle et al., 2001) in which people are directed by factors including personality to act accordingly. Furthermore, personality creates an identity for individuals. People build on existing identities and create new ones based on different situations. Thus, all individuals are different based on their prior experiences. Given the example of a leader whose sense of self requires a long period of time to develop (Day, Harrison, & Halpin, 2009), his or her identity dates back to grade school (Komives, Owen, Longersbeam, Mainella, & Osteen, 2005). A leader’s identity thus motivates decisions and goal setting activities in order to empower others. The leadership students studied in this article are shaped by their identities, which are predicted to be influenced by personality factors.

Research has demonstrated the development of self to be activated by various social relationships (Andersen & Chen, 2002). When given an example such as understanding undergraduate leadership students, their peer, professor, supervisor, and personal relationships induce self-identities along with the influence of personality. Accordingly, it is important to realize the effect of both individual and social processes driving the development of one’s self to set and select goals (Lord et al., 2010).

Furthermore, it is essential to note that processes in goal setting involve time perspectives - both near self-construal (i.e., “me tomorrow”) and distant self-construal (i.e., “me in a year”) (Lord et al., 2010). Depending on the personality type held, some individuals are better situated to process or feasibly construct short term goals or conversely long-term goals. Distant self-construal has been closely linked to a stable personality set than near self-construal (Lord et al., 2010). Thus, the effect on individuals’ perspectives on time - whether long or short term - must be factored into the relationship in order to investigate personality and goal selection appropriately. Additionally, through correlational analyses, significant relationships between age and personality factors has been found (McElravy & Hastings, 2014).

Barrick and Mount (1991) provided an investigation that emphasizes the relationship between personality and job performance, which sets potential for a proxy study of personality and goal selection and setting. Results indicated a consistent correlation between conscientiousness as a valid predictor for job performance. Further, extraversion and agreeableness also exhibited a correlation with job performance though lower than that of conscientiousness. The results described very little support for emotional stability as a predictor for job performance and the values for openness showed little to no relation in regards to job performance (Barrick & Mount, 1991).

### **Purpose & Research Questions**

The purpose of this study was to examine how undergraduate agricultural leadership students’ personality predicted their goal orientation. The study was driven by the following research objectives:

1. Describe the personality characteristics of undergraduate agricultural leadership students in a group and team course using the five-factor model of personality.
2. Describe the goal setting characteristics of undergraduate agricultural leadership students in a group and team course.
3. Identify the relationship between personality and goal setting in undergraduate agricultural leadership students in a group and team course.
4. Identify how personality predicts goal setting in undergraduate agricultural leadership students in a group and team course.

### **Methods**

The population for this study was undergraduate agricultural leadership students. A descriptive and correlational research design was employed to address the research objectives. A census of three classes of undergraduate agricultural leadership students from a single course taught over multiple semesters in a single southern land grant university was included in the study. The course was an upper level offering directed at group and team leadership. Data were collected in the spring of 2013 ( $n = 32$ ), the spring of 2014 ( $n = 44$ ), and the spring of 2015 ( $n = 40$ ). A total of 116 responses were obtained and represented a 97% response rate. Respondents received no compensation or course credit for participating in the study. The data analyzed in the present study capitalize on data collected in the Lamm, Sheikh, Carter, and Lamm (2017)

sample. The current study extends on the results of the previous study in two important ways. First, the first study included multiple courses for personality analysis, including an introductory leadership course. The current study provides a more discrete view of personality trends within a specific leadership class directed more towards upper-level undergraduates taught over the course of three semesters. Secondly, the variable of interest in the current study is student goal setting, with personality used as an antecedent predictor of students' self-determined grade goals. These disclosures are presented based on recommendations within the literature for clarity (Kirkman & Chen, 2011).

Demographic data were obtained through respondent self-report. The sample was 33% ( $n = 38$ ) male and 67% ( $n = 77$ ) female. Respondents represented all undergraduate classifications within the university, 0.9% ( $n = 1$ ) freshman, 6.1% ( $n = 7$ ) sophomore, 35.7% ( $n = 41$ ) junior, 57.4% ( $n = 66$ ) senior. Participant race and ethnicity were defined as self-perceived membership in population groups that define themselves by cultural heritage, language, physical appearance, behavior, or other characteristics ("Standards", 1995, p. 26). From an ethnicity perspective 8.8% ( $n = 10$ ) of respondents identified themselves as Hispanic/Latino(a)/Chicano(a). In regard to respondents' race, 84.2% ( $n = 96$ ) identified themselves as White, 7.0% ( $n = 8$ ) identified themselves as Black or African American, 8.8% ( $n = 10$ ) identified themselves as Asian or Pacific Islander, 0.9% ( $n = 1$ ) identified themselves as American Indian or Alaska native. Additionally, three individuals identified themselves within an 'Other' category.

A paper-based questionnaire was used to collect data for the study. The questionnaire was distributed, completed, and collected during class. The data were collected at the beginning of the semester after students had been assigned into their project teams. The questionnaire was comprised of previously developed, valid and reliable instruments to increase observed data validity and reliability (Ary, Jacobs, & Sorensen, 2010). Additionally, the questionnaire was reviewed by a panel of experts knowledgeable in survey design, personality, and undergraduate instruction for face and content validity prior to administration.

Personality data were collected using the Johnson (2011) version of the IPIP-NEO (Goldberg et al., 2006). The instrument included 44 personality statements, with responses on a five-point, Likert-type scale. Possible responses to each item included: 1 – *Strongly Disagree*, 2 – *Disagree*, 3 – *Neutral*, 4 – *Agree*, 5 – *Strongly Agree*. The instrument was selected based on previously established reliability with observed Cronbach's  $\alpha$  values of .70 or greater (Johnson, 2011). Based on established social science research standards, a Cronbach's  $\alpha$  of .70 or greater is considered sufficient (Cortina, 1993; Schmitt, 1996; Streiner, 2003). Specifically, the emotional stability index was found to have a Cronbach's  $\alpha$  of .76, the conscientiousness index was found to have a Cronbach's  $\alpha$  of .74, the agreeableness index was found to have a Cronbach's  $\alpha$  of .81, the extraversion index was found to have a Cronbach's  $\alpha$  of .83, and the openness index was found to have a Cronbach's  $\alpha$  of .69.

As part of the questionnaire students were asked to set distant goals for desired grades in the class and for a group project. Specifically, students were asked, *as you think about your personal goals specific to this course, please enter the percentage score you would like to achieve on your leadership group project*. A similar question was presented asking students to enter the percentage score they would like to achieve in the class overall. The stated goals would

not be achieved until after a full, semester long course was completed. Self-identified goals, in the form of grade achievement, were collected based on recommendations within the literature (e.g. Harackiewicz, Tauer, Barron, & Elliot, 2002).

Results were analyzed using SPSS version 25. Descriptive statistics were calculated to determine the personality and goal setting of respondents. Relationships between variables were examined through Pearson product-moment correlations. The predictive capacity between personality variables and goal setting was examined through simultaneous multiple regression (Ary et al., 2010).

## Results

### Personality

Respondent personality scores were calculated using the IPIP-NEO scoring key (Johnson, 2011). IPIP-NEO agreeableness scale scores are based on a one to five scale. Respondents had the highest mean score in agreeableness ( $M = 3.86$ ,  $SD = .35$ ) and the lowest mean score in extraversion ( $M = 3.57$ ,  $SD = .69$ ). The mean, standard deviation, minimum, and maximum scores for each personality factor (emotional stability, conscientiousness, agreeableness, extraversion, and openness) are presented in Table 1. A one-way between subjects ANOVA was conducted to compare the effect of class on personality for the spring 2013, spring 2014, and spring 2015 course conditions. There was not a significant effect of course on any of the five personality factors at the  $p < .05$  level for the three course conditions.

Table 1

*Personality Scale Scores of Undergraduate Agricultural Leadership Students in a Groups and Teams Course*

Personality Scale Scores	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Emotional Stability	113	3.70	0.64	1.60	4.80
Conscientiousness	114	3.69	0.60	2.00	5.00
Agreeableness	107	3.87	0.35	2.92	4.58
Extraversion	115	3.57	0.69	1.20	5.00
Openness	114	3.72	0.57	2.40	5.00

### Goal Setting

Respondent self-identified grade goals were collected for both project level grades as well as overall class level grades. The mean, standard deviation, minimum, and maximum grade goals for project grade and class grade are presented in Table 2. A one-way between subjects ANOVA was conducted to compare the effect of class on goal setting for the spring 2013, spring

2014, and spring 2015 course conditions. There was not a significant effect of course on either project grade goal nor class grade goal at the  $p < .05$  level for the three course conditions.

Table 2

*Self-Identified Goal Set by Undergraduate Agricultural Leadership Students in a Groups and Teams Course*

Grade Goal	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Project	113	96.32	6.17	50.0	100.0
Class	113	95.60	5.76	50.0	100.0

**Relationships between Personality and Goal Setting**

Pearson product-moment correlations between personality and goal setting, both project and class, were completed to investigate the nature of the relationship between variables (Ary et al., 2010). Correlation coefficients and statistical significance between variables are provided in Table 3. Statistically significant correlations ranged from low to very high in magnitude (Davis, 1971). Statistically significant correlations were observed between project and class grade goals. Additionally, statistically significant correlations between conscientiousness and agreeableness were observed for both project and class grade goals.

Table 3

*Intercorrelations between Personality and Goal Setting*

	Project Goal	Class Goal
Project Goal	-	
Class Goal	.87***	-
Emotional Stability	.14	.15
Conscientiousness	.19*	.19*
Agreeableness	.39***	.33**
Extraversion	.12	.06
Openness	.15	.10

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Personality Predicting Goal Setting**

Multiple regression analysis was completed to determine whether a predictive relationship existed between the five personality factors and self-identified grade goals for both

project and class conditions. Self-identified grade goals were treated as a dependent variable. The five personality factors were treated as the independent variables of interest.

Unstandardized regression coefficients in the form of variable level effects along with statistical significance for the project goal setting model are provided in Table 4. According to the analysis 17% of the variance in project goal setting is explained by the five factors of personality, and this explained variance is statistically significantly different from 0 because the omnibus model is statistically significant ( $R^2 = .17$ ,  $F(5, 98) = 4.08$ ,  $p < .002$ ). The personality factor of agreeableness was found to be a statistically significant predictor when controlling for all five personality factors.

Table 4

*Predicted Impact of Personality Factors on Project Goal Setting*

	<i>b</i>	<i>p</i>
Constant	62.93	.000***
Emotional Stability	.61	.558
Conscientiousness	.10	.930
Agreeableness	6.62	.001**
Extraversion	.23	.811
Openness	1.13	.331

*Note.* \*\*\* $p < .001$ , \*\* $p < .01$ ,  $R^2 = .17$

Unstandardized regression coefficients in the form of variable level effects along with statistical significance for the class goal setting model are provided in Table 5. According to the analysis 13% of the variance in project goal setting is explained by the five factors of personality, and this explained variance is statistically significantly different from 0 because the omnibus model is statistically significant ( $R^2 = .13$ ,  $F(5, 98) = 2.79$ ,  $p < .021$ ). The personality factor of agreeableness was found to be a statistically significant predictor when controlling for all five personality factors.

Table 5

*Predicted Impact of Personality Factors on Class Goal Setting*

	<i>b</i>	<i>p</i>
Constant	70.13	.000***
Emotional Stability	.82	.414
Conscientiousness	.63	.552
Agreeableness	5.06	.006**
Extraversion	-.23	.802
Openness	.36	.748

*Note.* \*\*\* $p < .001$ , \*\* $p < .01$ ,  $R^2 = .13$

## **Conclusions, Recommendations, and Implications**

The results of the study illuminate one of the primary concerns educators have for engaging learners, specifically, how to get learners to direct their learning process in a self-managed way (McKeachie & Svinicki, 2013). Goal setting has been studied extensively within the literature (e.g. Diefendorff & Lord, 2008); however, there are a limited number of studies that examine how undergraduate leadership students set goals. Specifically, as it relates to a class focused on group and team leadership the purpose of this course was to examine this process. What is known is that self-identified goals tend to be more cogent for the individual and that generally individuals will persist more in pursuit of such goals, particularly when compared to the efficacy of goals set by someone else (e.g. Ryan & Deci, 2000).

Personality, as one of the more stable learner characteristics provides an interesting backdrop upon which to examine the goal setting process (e.g. Lamm et al., 2014). Results indicate that across three times that a course was taught at a single institution, with different learners participating in the course each time, personality level observations were independent of class. An implication resulting from this study is that individuals teaching an upper level undergraduate leadership course, particularly focused on groups in teams within the institution in which the data were collected, may want to use the study results as an initial set of guidelines upon which to evaluate future classroom personality composition. Results indicate that extraversion had the lowest mean score across multiple classes. Therefore, a recommendation would be for educators to consider employing teaching techniques that will provide a safe and supportive environment for learners to interact amongst each other. Additionally, agreeableness held the highest observed mean score. It is recommended that educators consider leveraging the potential tendency to frame the nature of teamwork. Thus, educators should emphasize the aspects of politeness and compassion necessary for teams to work effectively and develop bonds which may resonate with learners.

Consistent with Schunk and Zimmerman (2007), McKeachie & Svinicki (2013) propose, “We know that strategic learners need to be able to set and use meaningful goals to help them learn and to help them generate and maintain their motivation for studying” (p. 294). The results of this study are informative from both a theoretical and practical perspective. From a practical perspective the study provides a potential methodology that educators can employ to encourage learners to set self-identified goals. A recommendation is for educators to consider asking undergraduate leadership students to write down their grade goals for a course at the beginning of the course. The process of identification has been shown to predict persistence and exertion in pursuing such goals (Ryan & Deci, 2000). From a theoretical perspective, the current study provides a point of reference upon which future research and observations can be compared. Within the sample of the current study learners tended to set high goals for themselves at both the project and course level. Future research is recommended to replicate this study within other learning environments to determine whether goal setting observations may differ among classes, audiences, or environments.

When examining the nature of the relationship between the five-factors of personality and goal setting there were noteworthy results. The very high correlation between project and class grade goals is perhaps not unexpected, but informative nevertheless. From a practical perspective, this result may be interpreted as learners tended to set similar goals for themselves at both the project and class level. This is an area where future research may be warranted to determine whether there is any incremental value of setting project level goals or if class level goals are sufficient. Consistent with previous results (Barrick & Mount, 1991), the statistically significant relationship between conscientiousness and goal setting was also somewhat anticipated. However, in previous research conscientiousness was found to be a more robust predictor than in the current study. A less anticipated result was the magnitude of the relationship between agreeableness and goal setting at both the project and class level. The results imply that more than any of the other observed personality variables, level of agreeableness had the strongest relationship with goal setting. A recommendation is for educators to consider framing goal setting exercises with learners in not only achievement, or conscientiousness, terms, but also consider ways in which agreeableness can be included. Therefore, acknowledging the facet of trust and trustworthiness (Costa & McCrae, 1992) within agreeableness may be a strong cognitive tool in motivating learners to: identify a goal, communicate that goal to the educator establishing a trust compact, and persist toward the goal as a demonstration of trustworthiness.

The observed predictive capacity of personality as antecedents of goal setting within the study are also informative. With 13% of the observed variance in class goal setting and 17% of the variance in project goal setting, personality held a statistically significant set of independent variables. However, the most noteworthy finding of both sets of analysis was the emergence of agreeableness as the only statistically significant predictor of self-identified grade goals. This was an unexpected finding given the strength of the relationship between conscientiousness and achievement previously observed (e.g. Barrick & Mount, 1991). The result implies that of all the personality factors, agreeableness is the only factor that was predictive of goal setting within the current study. Consequently, a recommendation is for educators to consider the importance of agreeableness when guiding learners through the goal setting process. Focusing on the trust and straightforwardness aspects of agreeableness (Costa & McCrae, 1992) within goal setting may resonate with learners and make the process more readily aligned with natural dispositions.

Despite the observed results there are limitations associated with the current study that must be addressed. First, the study, while covering three classes of students, is not generalizable to a general population of learners, or even learners in other classes or institutions. Although statistically significant relationships were observed, future research is recommended to further illuminate that nature of personality and goal setting with different learner audiences, different courses, and different institutions. An additional limitation is the potential for respondent bias in the results. Although statistical controls and checks were made to mitigate the possibility of systemic response bias there is the possibility that respondents were not truthful or committed to their identified grade goals. Additional research may be appropriate to consider not only grade goals, but ultimately grade attainment. This research may also provide insights as to predictors of goal persistence among learners.

A persistent question amongst educators focuses on how to make learning experiences more meaningful and engaging (Roberts et al., 2016). Based on the results of this study, educators now have empirical data to inform educational decisions. Although generalizability of the results is limited, the application of methods and recommendations should provide additional options and opportunities to educators towards experimentation and replication as seen appropriate.

### References

- Andersen, S.M. and Chen, S. (2002). The relational self: An interpersonal social-cognitive theory. *Psychological Review*, 109(4), 619–645.
- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education*. Belmont, CA: Wadsworth Cengage Learning.
- Ashforth, B. E., & Humphrey, R. H. (1995). Emotion in the workplace: A reappraisal. *Human Relations*, 48, 97–125.
- Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel Psychology*, 44(1), 1–26.
- Carver C.S., & Scheier M.F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.
- Cortina, J. M. (1993). What is coefficient alpha? an examination of theory and applications. *Journal of Applied Psychology*, 78(1), 98-104. doi:10.1037/0021-9010.78.1.98
- Costa, P. T., Jr, & McCrae, R. R. (1992). *Revised NEO personality inventory and five factor inventory professional manual*. Odessa, FL; Psychological Assessment Resources.
- Day, D.V., Harrison, M.M., & Halpin S.M. (2009). *An integrative approach to leader development*. New York: Routledge.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- Diefendorff, J. M., & Lord, R. G. (2008). Self-regulation and goal striving processes. In R. Kanfer, G. Chen, & R. Pritchard (Eds.), *Work motivation: Past, present, and future* (pp. 151–196). New York, NY: Routledge/Taylor & Francis Group.
- Fiske, S. T., Gilbert, D. T., & Lindzey, G. (2010). *Handbook of social psychology* (5th ed.). New York, NY: Wiley

- Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. C. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality, 40*, 84-96.
- Eysenck, H. J. (1992). Four ways five factors are not basic. *Personality and Individual Differences, 13*, 667-673.
- Goldberg, L. R. (1990). An alternative “description of personality”: The big-five factor structure. *Journal of Personality and Social Psychology, 59*, 1216-1229.
- Gollwitzer, P.M., & Moskowitz, G. B. (1996). Goal effects on thought and behavior. In E.T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: handbook of basic principles* (pp. 287-312). New York: Guilford Press.
- Harackiewicz, J. M., Tauer, J. M., Barron, K. E., & Elliot, A. J. (2002). Predicting success in college: a longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology, 94*(3), 562-575.
- Johnson, J. A. (2011). Development of a short form of the IPIP-NEO personality inventory. *Poster Presented at the 2nd Biennial Meeting of the Association for Research in Personality*, Riverside, CA.
- Judge, T.A., & Bono, J. E. (2000). Five-Factor model of personality and transformational leadership. *Journal of Applied Psychology, 85*(5), 751-765.
- Karoly, P. (1993). Mechanisms of self-regulation: A systems view. In L. W. Porter & M. R. Rosenzweig (Eds.), *Annual Review of Psychology* (Vol. 44, pp. 23-52). Palo Alto, CA: Annual Reviews.
- Kirkman, B.L. & Chen, G. (2011). Maximizing your data or data slicing: Recommendations for managing multiple submissions from the same data set. *Management and Organization Review, 7*, 3, 433-446. doi: 10.1111/j.1740-8784.2011.00228.x
- Kleihauer, S., Stephens, C.A., Hart, W.E., & Stripling, C.T. (2013). How six women deans of agriculture have attained their leadership role: A qualitative study. *Journal of Agricultural Education, 54*(3), 15-27. Doi:10.5032/jae.2013.03015
- Komives, S. R., Owen, J. E., Longerbeam, S. D., Mainella, F. C., & Osteen, L. (2005). Developing a Leadership Identity: A Grounded Theory. *Journal of College Student Development, 46*(6), 593-611.
- Lamm, K. W., Carter, H. S., Stedman N. L. P., & Lamm, A. J. (2014). Teaching transformational leadership to undergraduate agricultural leadership students: using the personality trait of agreeableness to improve understanding. *Journal of Agricultural Education, 55*(4), 24-37. doi: 10.5032/jae.2014.04024

- Lamm, K. W., Sheikh, E., Carter, H. S., & Lamm, A. J. (2017). Predicting undergraduate leadership student goal orientation using personality traits. *Journal of Leadership Education, 16*(1), 18–33.
- Lord, R. G., Diefendorff, J. M., Schmidt, A. M., & Hall, R. J. (2010). Self-regulation at work. *Annual Review of Psychology, 61*, 543-568.
- Lord, R. G., & Levy, P. E. (1994). Moving from cognition to action: A control theory perspective. *Applied Psychology: An International Review, 43*(3), 335–367.
- McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology, 52*(6), 1258–1265.
- McCrae, R. R., & Costa Jr, P. T. (1991). The neo personality inventory: Using the five-factor model in counseling. *Journal of Counseling & Development, 69*(4), 367-372.
- McElravy, L.J., & Hastings, L.J. (2014). Profiling the youth leader: Personality and emotional intelligence trends and their relationship to leadership skills. *Journal of Agricultural Education 55*(1), 134-151. doi: 10.5032/jae.2014.01134
- McKeachie, W., & Svinicki, M. (2013). *McKeachie's teaching tips*. Cengage Learning.
- Muchinsky, P. M. (2000). Emotions in the workplace: The neglect of organizational behavior. *Journal of Organizational Behavior, 21*(7), 801–805.
- Newell A. (1990). *Unified Theories of Cognition*. Cambridge, MA: Harvard University Press.
- Raichle M.E., MacLeod A.M., Snyder A.Z., Powers W.J., Gusnard D.A., & Schulman G.L. (2001). A default mode of brain function. *Proceedings of the National Academy of Sciences of the United States of America, 98*(2), 676-682.
- 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.
- Ryan, R. M., & Deci, E. L. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268. DOI: 10.1207/S15327965PLI1104\_01
- Schmidt, A. M., & DeShon, R. P. (2007). What to do? The effects of discrepancies, incentives, and time on dynamic goal prioritization. *Journal of Applied Psychology, 92*(4), 928–941. doi:10.1037/0021-9010.92.4.928
- Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment, 8*(4), 350-353. doi:10.1037/1040-3590.8.4.350

Schunk, D. H., & Zimmerman, B. J. (Eds.). (2007). *Motivation and self-regulated learning: Theory, research, and applications*. Mahwah, NJ: Lawrence Erlbaum.

Standards for the classification of federal data on race and ethnicity. (1995). Retrieved from [http://www.whitehouse.gov/omb/fedreg\\_race-ethnicity/](http://www.whitehouse.gov/omb/fedreg_race-ethnicity/)

Streiner, D. L. (2003). Starting at the beginning: An introduction to coefficient alpha and internal consistency. *Journal of Personality Assessment*, *80*(1), 99-103.  
doi:10.1207/S15327752JPA8001\_18

Watson, D., & Clark, L. A. (1997). Extraversion and its positive emotional core. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychology*. (pp. 767–793). San Diego, CA: Academic Press.

Vancouver, J. B., & Day, D. V. (2005). Industrial and organisation research on self-regulation: From constructs to applications. *Applied Psychology: An International Review*, *54*(2), 155–185. <https://doi.org/10.1111/j.1464-0597.2005.00202.x>

## Discussant Remarks

### Undergraduate Goal Setting: Analyzing Personality as a Predictor

Discussant: Bill Weeks, Professor, Oklahoma State University

This study sought to determine if a relationship existed between a student's score on the Big 5 Personality Dimensions Scale and the score they planned to earn in an undergraduate leadership course. The authors gathered data from 116 students in three groups who enrolled in the course in 2013, 2014, and 2015. The authors are to be commended for using the most currently widely accepted measure of personality.

Results showed that students scored highest on agreeableness but with little variation from the other four personality dimensions. Further, agreeableness was found to be a predictor of grade achievement. Readers should predictably nod their head, as an agreeable student will follow course assignment guidelines that will result in the desired grade.

Questions rumbling around in my head.

- The “n” for the five scales varied slightly, if all students completed the instrument, why are they different? In addition, both measures of the grade goal had the same “n”.
- Do students learn about the five-factor model as part of this class?
- If extraversion is consistently the lowest personality factor, might the instructors reconsider their team project?
- What did you find in your study that compels you to recommend that students write down a grade goal?

# Evaluating Leadership Development Programs: A Social Network Analysis Approach

Kevan W. Lamm, University of Georgia  
Hannah S. Carter, University of Florida

## Abstract

*When asked about the benefits of participating in agriculture and natural resource (ANR) leadership development programs, one of the most frequent responses is the network that one can develop. However, despite the ubiquity of the perceived benefit there have been few empirical studies conducted to examine network development within ANR leadership development programs. With improved social network data capture and analysis techniques, contemporary ANR leadership development programs, and leadership educators more generally, are well positioned to take advantage of these developments. The results of the current study indicate that social network analysis is an appropriate tool for establishing evaluative measures of network emergence and development within ANR leadership development programs.*

## Introduction

When asked about the benefits of participating in agriculture and natural resource (ANR) leadership development programs, one of the most frequent responses is the network that one can develop (e.g. Kelsey & Wall, 2003). However, despite the ubiquity of the perceived benefit there have been few empirical studies conducted to examine network development within ANR leadership development programs. From an educational perspective, ANR leadership development programs also represent non-traditional composite learning environments that typically include both formal and non-formal educational components (Kaufman, Rateau, Carter, & Strickland, 2012).

At the most fundamental level, leadership is about interactions between people. Northouse (2013) has defined leadership as, “a process whereby an individual influences a group of individuals to achieve a common goal” (p.5). Leadership development programs therefore should naturally encourage and enable the development of these connections between participant learners. However, one of the critiques of leadership development programs more generally is a lack of rigor and accountability related to outcomes and impacts (Kellerman, 2012). Consequently, there seems to be a persistent challenge to quantify and empirically report that which is more tacitly experienced by participant learners.

As social creatures (e.g. Ryan & Deci, 2000), humans and the interactions between oneself and others is a fundamental aspect of humanity (Bass, 2008). Social networks are a natural extension of this shared experience. ANR leadership development programs are generally composed of cohorts of individuals sharing common experiences and interacting throughout the program (Kaufman et al., 2012). Based on Bandura’s Social Learning Theory (1977) it has been established that part of the learning process is conditional on the shared learning experience amongst participants. From a social interaction perspective, the connections between individuals is paramount, “what happens to a group of actors is in part a function of the structure of connections among them” (Borgatti, Everett, & Johnson, 2018, p. 1).

With improved social network data capture and analysis techniques, contemporary ANR leadership development programs, and leadership educators more generally, are well positioned to take advantage of these developments. With more sophisticated techniques available to measure, monitor, and evaluate social network, educators can be more responsive to the needs of learners (McKeachie & Svinicki, 2013). Furthermore, social network data can provide additional evaluation data educators can use to quantify the ANR leadership development program experience and outcomes

Priority area five of the National Research Agenda: American Association for Agricultural Education 2016 – 2020 (Roberts, Harder, & Brashears, 2016) addresses efficient and effective agricultural education programs with a particular focus on, “What evaluation methods, models, and practices are effective in determining the impacts of educational programs in agriculture and natural resources?” (p. 43). The purpose of this research is to present an evaluation approach and methodology for capturing and reporting leadership development programming impacts and outcomes, specifically the emergence and composition of networks among program participants.

### **Conceptual Framework**

The conceptual framework for this study was based on social capital (Coleman, 1988) and social networks (Borgatti, Mehra, Brass, & Labianca, 2009). The integration of the two theory bases is intended to provide both a theoretical basis for phenomenon to occur, in this case social capital preceding network emergence, and a theoretical framework in which to quantify the outcome, social networks.

#### **Social Capital**

As Coleman (1988) established, social capital plays a significant role in human capital development. An individual amasses network connections and assets, these assets are then available to employ when appropriate (Burt, 2009). Network assets, or social capital is thus comprised of both strong and weak connections throughout a network (Lin, 2008). Additionally, the social capital is composed of norms within a network that facilitate mutual understanding and expectations (Woolcock & Narayana, 2000).

Fundamentally, social capital may be considered to be a measure of informal power among a heterogenous group, or network (Bass, 2008). Although an individual with a higher level of social capital may not hold a formal position of authority within a network, such an individual is generally viewed as holding a degree of influence and access to resources beyond those of their peers (Rogers, 2003). More specifically, “the concept of social capital refers to the ways in which people make use of their social networks in *getting ahead*.” (Hsung, Lin, & Breiger, 2010, Location No. 319).

Within the literature, social capital has been examined extensively. Stemming from the seminal works of Coleman (1988) and Lin, Fu, and Hsung (2001), social capital remains a relevant theory base for inquiry and analysis. For example, Mollenhorst, Völker, and Flap (2008), examined the relationship between social contexts and building personal networks. According to the researchers the place where people meet their network members is important to the resulting relationship. Additionally, Erickson (2004) found that within the context of a local

community organization that facilitated the sale of goods and services amongst the group that social capital accrued at the local level had a relationship with social capital at a higher order level. Consequently, the existence of social capital locally within the organization was related to more social capital outside of the organization, in the community at large.

## **Social Networks**

Although contemporary social network analysis is done within the context of methodological rigor, social networks should not be confused with a methodology. Instead social networks are a representation of social phenomenon grounded in theoretical concepts intended to explain the social world (Borgatti & Halgin, 2011). Humans, and social interactions amongst humans, are complex based on the multitude of variables that may influence such interactions. However, despite the acknowledged challenges associated with observing and quantifying interactions, social network analysis has been employed widely to capture and analyze the phenomenon (Borgatti et al., 2009).

For example, Johnson, Boster, and Palinkas (2003), analyzed small group development among individuals. From an organizational interaction perspective, Lamm and Lamm (2017) examined the nature of relationships between funding agencies as reported by Biological Science educators. Additionally, Scott, Jiang, Wildman, and Griffith (2017), analyzed the emergence and of leadership networks in teams as well as the effectiveness of such networks. As it relates to leadership and social networks, Chrobot-Mason, Gerbasi, and Cullen-Lester (2016) analyzed the relationship between organizational identity and leadership identification, finding “individuals who identify strongly with their organization and team are more likely to see others as sources of direction, alignment, and commitment” (p. 307).

## **Purpose & Research Questions**

The purpose of this study was to analyze social network characteristics of an ANR leadership development program. The study was driven by the following research objectives:

1. Describe the nature of existing relationships amongst class members.
2. Describe the nature of advice seeking within network.
3. Describe the nature of support seeking within network.
4. Describe the nature of industry decision influence within network.
5. Describe the nature of industry influence within network.

## **Methods**

A social network research design was employed for this study, specifically a whole-network design. An online questionnaire was developed based on recommendations within the literature (Borgatti et al., 2018). The questionnaire was developed for the purposes of the research and reviewed by a panel of experts to ensure content and face validity.

The questionnaire was sent to all 30 of the leadership development program participants in September 2016, prior the first session of the program. The timing was intentional to establish a robust baseline network measure and to minimize the effects of in-person interactions that

occur after the program began (Borgatti et al., 2018). There were 29 responses for a 97% response rate. Consistent with the recommendations within the literature (Bono & Anderson, 2005), respondents were first asked to indicate whether they knew each of the 29 other class participants. All results from the analysis replaced respondent names with an ID number placeholder to preserve anonymity (Borgatti et al., 2018).

Next, respondents were asked how likely they were to seek advice from each of their classmates. There were two items used to assess advice. First, “If you needed help, you would seek advice from this person.” Second, “You would seek support from this person if you wanted to implement a new idea.” The items were adapted from sources previously established within the literature (e.g. Bono & Anderson, 2005; Ibarra, 1993; Salk & Brannen, 2000). Individuals indicated their response on a five-point, Likert-type scale. Possible responses to each item included: 1 – *Strongly Disagree*, 2 – *Disagree*, 3 – *Neutral*, 4 – *Agree*, 5 – *Strongly Agree*. Consistent with recommendations within the literature (Borgatti et al., 2018) scores were then converted to a dichotomous scale to facilitate analysis. Scores of 4 or 5 were coded as 1 and all other scores were coded as 0.

To examine influence within the network two questions were asked. First, “This person has a great deal of influence on the decisions that get made in your industry.” Second, “This person has a great deal of influence on what happens in your industry.” The items were adapted from sources previously established within the literature (e.g. Bono & Anderson, 2005; Brass & Burkhardt, 1993; Salk & Brannen, 2000). Participants responded to these questions for each classmate, using the same 5-point scale used for advice-likelihood. Consistent with recommendations within the literature (Borgatti et al., 2018) scores were then converted to a dichotomous scale. Scores of 4 or 5 were coded as 1 and all other scores were coded as 0.

The Ucinet 6 software package was used to visualize the network. Nodes represent participants and the lines connecting them indicate an individual (or multiple individuals) have a relationship. Node color is based on participant sex as reported by the participant. Blue indicates a male and pink indicates a female. Node size is determined by centrality within the network. Larger nodes indicate a more central location within the network. Line color is an indicator of whether the connection is reciprocal or one-way. Reciprocal relationships are displayed in red whereas one-way relationships are displayed in grey.

## **Results**

### **Visualization of Existing Relationships Amongst Class Members**

Using the Ucinet 6 software package, the network of pre-existing known relationships amongst class members was visualized. A complete network map is provided in Figure 1. Within the group there were three individuals that did not have any pre-existing connections to other class members. Additionally, there was one pair of isolates only connected to each other, as well as four pendants, or individuals only connected to only one other person. Nevertheless, there were actors, ID2, ID1, ID15, ID10, ID19, ID7, and ID13 that had a high number of both reciprocal and unidimensional ties within the network.

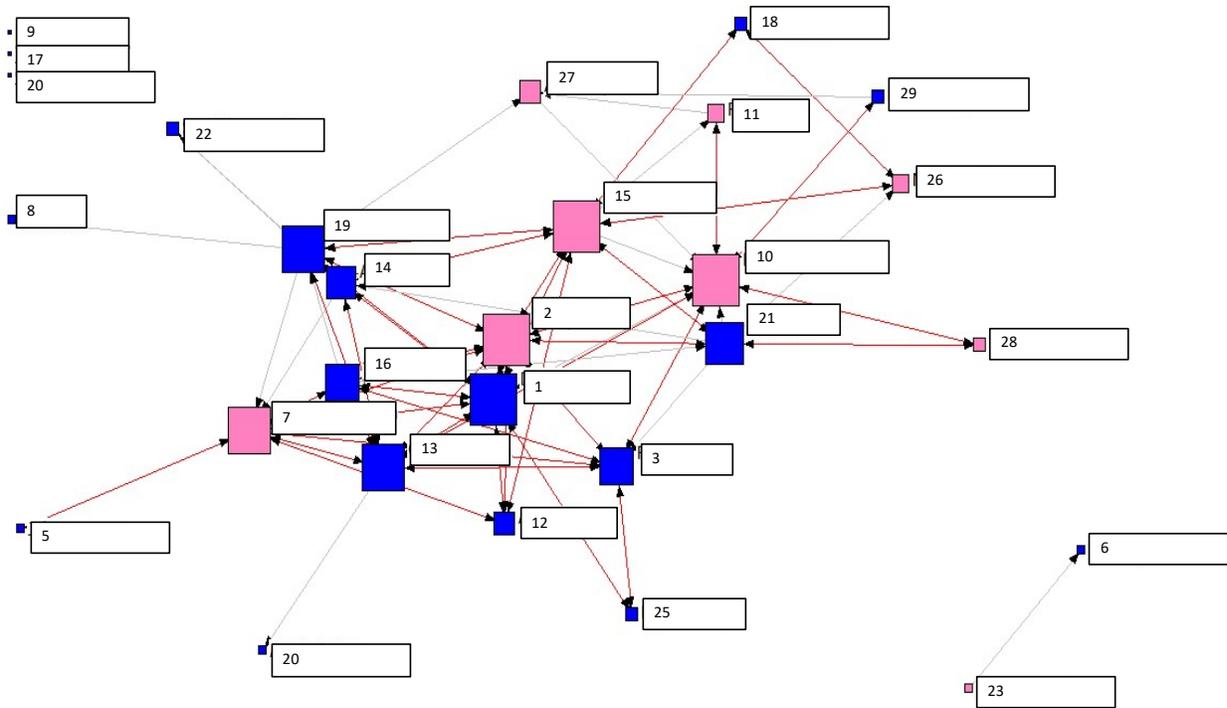


Figure 1. Map of existing relationships amongst class members.

### Density of Existing Relationships in Network

Density of the network was analyzed, specifically, the number of ties observed in the network as a proportion of the total number of possible ties (Borgatti et al., 2018). A density value of .166 with an average degree of 4.66 was calculated. The result indicated that across all possible connections between nodes, 16.6% of connections exist. Additionally, the mean number of connections per individual is 4.66 across the network.

### Visualization of Advice Likelihood Amongst Class Members

The visual representation of the advice seeking within the network is presented in Figure 2. The general characteristic of the network would indicate a centralized, core/periphery, pattern whereby there is a dense cluster of individuals that were located at the center of the network and the majority of the other individuals in the network distributed throughout the periphery of the network (Borgatti et al., 2018). Among the individuals clustered in the center of the network, ID4, ID9, ID22, and ID25 the nature of their centrality tends to be unidirectional, represented by grey lines, and not reciprocal, represented by red lines. Therefore, the centrality of these actors within the network is driven by their willingness to seek advice from many of their classmates. To the contrary actors ID2, ID10, and ID15 are more likely sources and recipients of advice within the network given the higher number of reciprocal ties. Actors ID1 and ID2 had the highest number of in-degree connections, or connections directed to them from others.

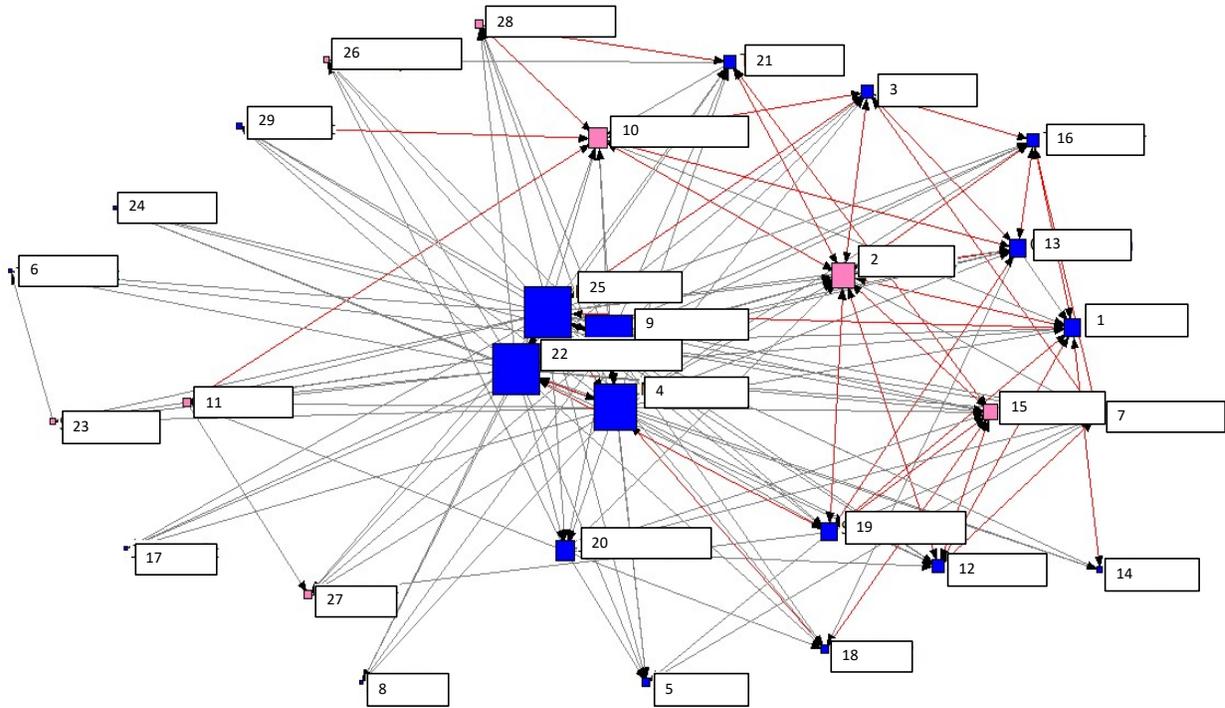


Figure 2. Map of advice seeking within network.

### Density Amongst Advice Likelihood Network

A density value of .238 with an average degree of 6.66 was calculated. The result indicated that across all possible connections between nodes, 23.8% of connections exist. The mean number of connections per individual is 6.66 across the network.

### Visualization of Support Likelihood Amongst Class Members

The visual representation of the support seeking within the network is presented in Figure 3. The general characteristic of the network would indicate a centralized, or core/periphery, pattern whereby there is a dense cluster of individuals that were located at the center of the network and the majority of the other individuals in the network distributed throughout the periphery of the network (Borgatti et al., 2018). Individuals, ID4, ID9, ID22, ID25, and ID2 were clustered in the center of the network. Reciprocity of ties among actors was distributed among both central and peripheral actors.

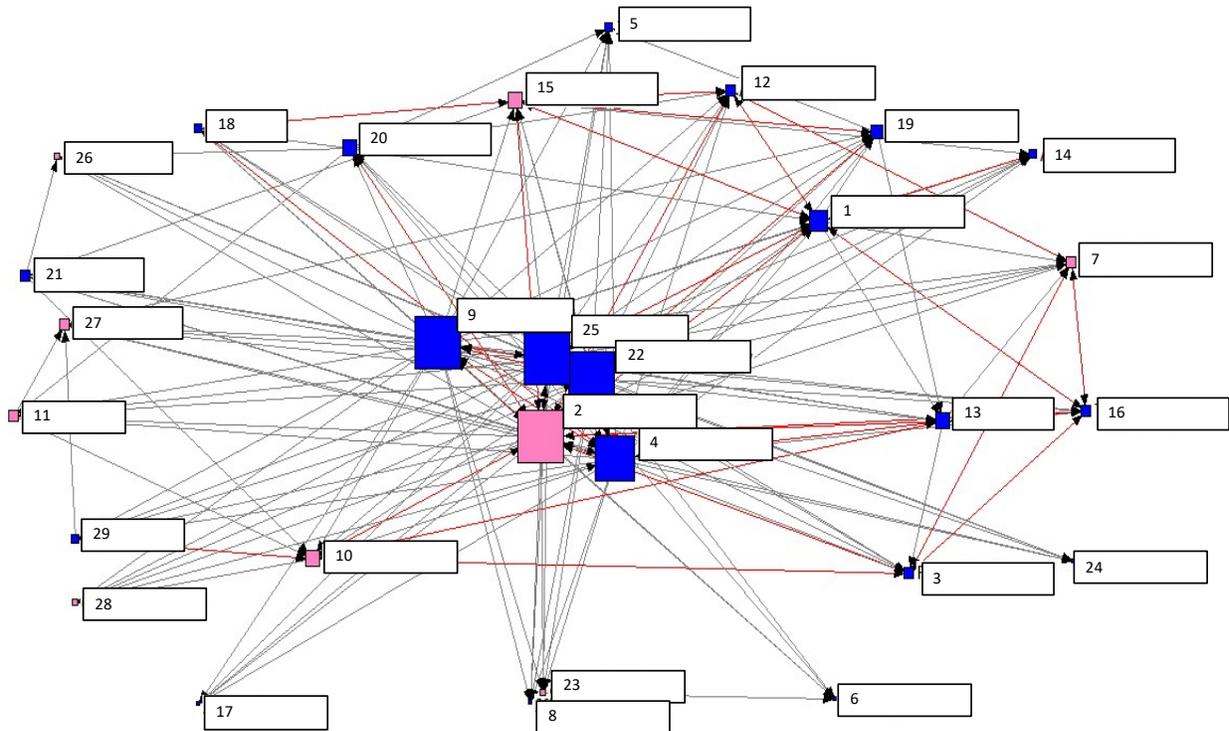


Figure 3. Map of support seeking within network.

### Density Amongst Support Likelihood Network

A density value of .249 with an average degree of 6.97 was calculated. The result indicated that across all possible connections between nodes, 24.9% of connections exist. The mean number of connections per individual is 6.97 across the network.

### Visualization of Industry Decision Influence Amongst Class Members

The visual representation of the industry decision influence within the network is presented in Figure 4. The general characteristic of the network would indicate a decentralized pattern whereby there are limited central actors and connections between nodes in the network are limited (Borgatti et al., 2018). There were five individuals that were isolates. These individuals indicated that none of the other classmates had a great deal of influence on the decisions that get made in their industry. Additionally, the remaining 24 classmates had the same response as it related to the five individuals influence on decisions that get made in their respective industries. Actor ID4 had the greatest number of connections among the network with the majority of ties being out-degree. Actor ID10 had the greatest number of in-degree connections.



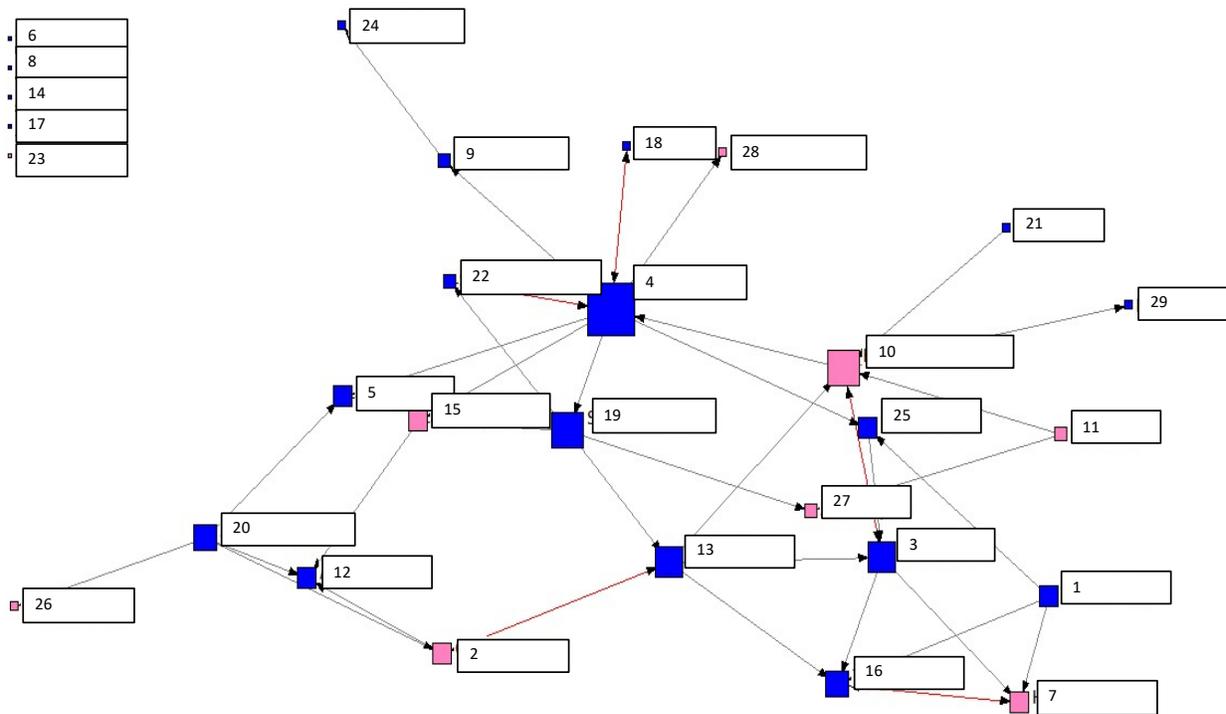


Figure 5. Map of industry influence within network.

### Density Amongst Industry Influence Network

A density value of .052 with an average degree of 1.45 was calculated. The result indicated that across all possible connections between nodes, 5.2% of connections exist. The mean number of connections per individual is 1.45 across the network.

### Conclusions, Implications, and Recommendations

Based on recommendations within the literature (e.g. Lamm, Carter, & Lamm, 2016), the current study was intended to provide a quantitative value as it relates to networks within ANR leadership development programs. Analyzing a single class of individuals at the start of a leadership development program provides an initial value that should provide insights to the program director as they work with the class over the course of the program. Additionally, the results of the evaluation should provide a baseline, and evaluative model for other programs and social network analyses. As an emerging analytical technique social network analysis lacks an extensive literature base, particularly as it relates to ANR audiences and educational settings. Consequently, there are few established thresholds to inform what constitutes network considerations such as cohesion and density (Borgatti et al., 2018).

The analyses conducted were based on recommendations within the literature, specifically: identifying existing relationships among class members, identifying advice seeking within the network, identifying support seeking within the network, identifying individual

influence on decisions within respective class member industries, and identifying individual influence on what happens within respective class member industries (Bono & Anderson, 2005).

The results of the analysis indicate that for the analyzed class there is a mixture of existing relationships among participants. Specifically, there are unidimensional ties, reciprocal ties, central actors, periphery actors, pendants, and isolates. This result implies that the current class has individuals that have known each other previously, as well as individuals that have not met anyone. Additionally, although there were several pre-existing relationships within the class, the network was not completely saturated, therefore there is an opportunity for the class to gain contacts and exposure within the agricultural and natural resource industry through program participation. A recommendation would be that the program leadership purposively look for opportunities to integrate any isolates or pendants into the larger group.

Analysis of advice seeking within the class indicated there was a cluster of four individuals that were at the core of the network. Upon further analysis the directionality of ties within the advice network were noteworthy, especially in regard to non-reciprocated connections. Specifically, within social network analysis network centrality is calculated based on both in-degree (the number of people that would take advice from the individual) and out-degree (the number of people the individual would take advice from) connections. For example, if an individual had an in-degree of three and an out-degree of 25 their network centrality would be based on 28 total connections. If a second individual had an in-degree of 15 and out-degree of two, their network centrality would be based on 17 total connections. Therefore, the first individual would appear as more central to the network than the second; however, the second individual would be more valuable to the network based on the much larger number of people that would seek advice from them (Borgatti et al., 2018).

The results of the advice seeking analysis imply that the program director should not consider ID25, ID9, ID22, and ID4 as class leaders based on their network centrality based on a high ratio of out-degree to in-degree connections. Instead these individuals are likely the most open to other ideas and insights, and humbler in their leadership and learning styles (Lamm, Carter, Stedman, & Lamm, 2014). However, ID1 and ID2 in the network had the highest number of in-degree connections, therefore these actors may be considered as opinion leaders within the group. A further implication from these findings is that the program leadership may be able to use ID1 and ID2 as opinion leaders and disseminators of information within the network (Lazarsfeld, Berelson, & Gaudet, 1948).

Consistent with advice seeking within the network, support seeking had a similar structure. A group of five individuals were clustered in the center of the network with the remaining class distributed at the periphery of the network. The same actors, ID25, ID9, ID22, and ID4 were central in both advice seeking and support seeking networks. An additional actor, ID2 was also central in the supporting seeking network. A noteworthy different is the reciprocal nature of ID2 connections, specifically, this individual was not only willing to seek support from class members, but was also seen as a source of support for class members. This result is not unexpected given the position and number of connections ID2 was observed to have within the existing relationships analysis. An implication from this finding would be that ID2 has the potential to take on a caretaking type role within the informal dynamics of the group. Seen as a

source of support the individual may be well positioned to liaise between class members, as well as between the class as a whole and program leadership.

Analyzing industry decision influence resulted in a less dense and less cohesive network. The results are expected given the diversity of ANR industries leadership development programs generally recruit from (Lamm, Lamm, & Carter, 2014). However, the results may also be valuable for the program leadership as specific experiences and educational interventions are planned. For example, if a goal for the program is to expose participants to a wide variety of ANR industries it may be more important to focus on the industries represented by isolates in the network. Specifically, ID6, ID8, ID14, ID17, and ID23 are not connected to the network indicating their industries are unique and not influenced by other actors in the class. Therefore, providing exposure to these industries may be beneficial for the participants. To the contrary if a goal for the program is the focus on a limited number of industries with the highest concentration of existing exposure it may be more appropriate to focus on the industries represented by more central actors in the network. Actor ID4 had the highest number of total connections, and ID10 had the highest number of in-degree connections. The industries represented by these individuals may be more appropriate if a more focused, tactical, and in-depth approach is preferred.

Shifting focus from industry decision influence to influence on what happens within industries a similar, but unique network pattern emerged. Unlike previous network visualizations, general influence had a clique formation indicated sub-groups within the class. This structure is informative as it should indicate to the program leadership that there are likely specific industries represented within the class and that there are actors that serve as bridges between the industries. Actors that serve in bridge roles are unique in that if they connect two, otherwise isolated cliques. Based on this information a recommendation for the program leadership would be to encourage actors ID4, ID10, ID19, and ID13 to actively contribute to peer learning conversations and share their unique insights (McKeachie & Svinicki, 2013). Active group conversation facilitation may stimulate conversations and perspectives that might not otherwise emerge.

Although there are contributions to both the literature base from a methodological and foundational result perspective, as well as practical implications for the evaluated ANR leadership development program there are limitations that should be addressed. First, interpretations of the results should be done within the context in which the data were collected. The data are only applicable to the program analyzed, trends, and generalizations should not be inferred beyond the class evaluated. Secondly, without existing thresholds to compare to, results and effect sizes should not be inferred. For example, a pre-existing observed network density of 16.6% cannot be interpreted as either dense or not dense. It should only be considered as a quantitative representation at a point in time.

Based on the results of the study and the noted limitations there are recommendations for future research. First, a recommendation would be for additional studies to replicate the analyses within similar environments, particularly ANR leadership development programs. As more results are available in the literature more pragmatic interpretation of results will be made possible. An additional recommendation is for the use of social network analysis to be conducted more widely throughout the agricultural education discipline. As an analytical technique social

network analysis can serve to illuminate the otherwise obscured nature of relationships among learners in both formal and non-formal environments (Borgatti et al., 2018). From a practical perspective a recommendation would be to collect social network data at both the beginning and end of ANR leadership development programs. Analysis of the difference in network composition and density following a program may serve as a valuable, quantitative, measure of impact and program efficacy. Such analysis will help to extend the results of this study and further inform “evaluation methods, models, and practices [that] are effective in determining the impacts of educational programs in agriculture and natural resources” (Roberts et al., 2016, p.43).

### References

- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, N.J.: Prentice-Hall.
- Bass, B. M. (2008). *The bass handbook of leadership*. New York, NY: Free Press.
- Bono, J. E., & Anderson, M. H. (2005) Advice and influence networks of transformational leaders. *Journal of Applied Psychology, 90*, 1306-1314.
- Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2018). *Analyzing social networks*. Thousand Oaks, CA: SAGE.
- Borgatti, S. P., & Halgin, D. S. (2011). On network theory. *Organization science, 22*(5), 1168-1181.
- Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. *Science (New York, N.Y.), 323*, 892-895. doi:10.1126/science.1165821
- Brass, D. J., & Burkhardt, M. E. (1993). Potential power and power use: An investigation of structure and behavior. *Academy of Management Journal, 36*, 441-470.
- Burt, R. S. (2009). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.
- Chrobot-Mason, D., Gerbasi, A., and Cullen-Lester, K. L. (2016), Predicting leadership relationships: the importance of collective identity. *The Leadership Quarterly, 27*, 298–311.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, 95-120. <https://doi.org/10.1086/228943>
- Erickson, B.H., (2004). The distribution of gendered social capital in Canada. In: H. Flap, and B. Volker (Eds.), *Creation and Returns of Social Capital* (pp. 27–50). Routledge, London.
- Hsung, R. M., Lin, N., & Breiger, R. L. (Eds.). (2010). *Contexts of social capital: social networks in markets, communities and families* (Vol. 43). Routledge. [Kindle version]. Retrieved from Amazon.com

- Ibarra, H. (1993). Network centrality, power and innovation involvement: Determinants of technical and administrative roles. *Academy of Management Journal*, 36, 471-501.
- Johnson, J. C., Boster, J. S., & Palinkas, L. A. (2003). Social roles and the evolution of networks in extreme and isolated environments. *Journal of Mathematical Sociology*, 27(2-3), 89-121. doi:10.1080/00222500305890
- Kaufman, E. K., Rateau, R. J., Carter, H., & Strickland, R. (2012). What's context got to do with it? An exploration of leadership development programs for the agricultural community. *Journal of Leadership Education*, 11(1), 121-139.
- Kellerman, B. (2012). *The end of leadership*. New York, NY: HarperCollins.
- Kelsey, K. D., & Wall, L. J. (2003). Do agricultural leadership programs produce community leaders? A case study of the impact of an agricultural leadership program on participants' community involvement. *Journal of agricultural education*, 44(4), 35-46, doi:10.5032/jae.2003.04035
- Lamm, K. W., Carter, H. S., & Lamm, A. J. (2016). Evaluating extension based leadership development programs in the southern united states. *Journal of Agricultural Education*, 57(1), 121-136. doi: 10.5032/jae.2016.01121
- Lamm, K. W., Carter, H. S., Stedman, N. L., & Lamm, A. J. (2014). Teaching transformational leadership to undergraduate agricultural leadership students: Using the personality trait of agreeableness to improve understanding. *Journal of Agricultural Education*, 55(4), 24-37.
- Lamm, A. J., & Lamm, K. W. (2017). Mapping the money: a social network analysis of funding relationships amongst higher education biology opinion leaders. *Natural Sciences Education*, 46(1), 1-10, doi:10.4195/nse2017.03.0006
- Lamm, K. W., Lamm, A. J., & Carter, H. S. (2014). Opinion leadership development: Context and audience characteristics count. *Journal of Agricultural Education*, 55(2), 91-105.
- Lazarsfeld, P., Berelson, B., & Gaudet, H. (1948). *The people's choice* (2nd ed.). New York: Columbia University Press.
- Lin, N. (2008). A network theory of social capital. In D. Castiglione, J. W. van Deth, & G. Wolleb (Eds.), *The handbook of social capital* (pp. 50-69). New York, NY: Oxford University Press.
- Lin, N., Fu, Y., & Hsung, R. (2001). The position generator: Measurement techniques for investigations of social capital. In N. Lin, K. Cook, & R. Burt (Eds), *Social capital, theory and research*: 57–81. New York: Aldine de Gruyter.
- McKeachie, W., & Svinicki, M. (2013). *McKeachie's teaching tips*. Cengage Learning.

- Mollenhorst, G., Völker, B., & Flap, H. (2008). Social contexts and personal relationships: The effect of meeting opportunities on similarity for relationships of different strength. *Social Networks*, 30(1), 60-68.
- Northouse, P. G. (2013). *Leadership: Theory and practice* (6th ed.). Thousand Oaks: 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.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.
- Ryan, R. M., & Deci, E. L. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268. DOI: 10.1207/S15327965PLI1104\_01
- Salk, J. E., & Brannen, M. Y. (2000). National culture, networks, and individual influence in a multinational management team. *Academy of Management Journal*, 43, 191-202.
- Scott, C. P., Jiang, H., Wildman, J. L., & Griffith, R. (2017). The impact of implicit collective leadership theories on the emergence and effectiveness of leadership networks in teams. *Human Resource Management Review*, 28(4), 464-481. doi:10.1016/j.hrmr.2017.03.005
- Woolcock, M., & Narayan, D. (2000). Social capital: Implications for development theory, research, and policy. *The World Bank Research Observer*, 15(2), 225-249. doi: 10.1093/wbro/15.2.225

## Discussant Remarks

### Evaluating Leadership Development Programs: A Social Network Analysis Approach

Discussant: Bill Weeks, Professor, Oklahoma State University

This study examines the network development that may occur in an agricultural based, statewide leadership development program. In many states programs of this type are directly or indirectly associated with agricultural education departments and agricultural leadership programs, and thus of importance to attendees at this conference. Community leadership programs at all levels are often criticized as being weak in leadership education and strong in promoting the skill development. Many programs embrace the leadership skill model and focus their energies, curriculum, and focus on broadening participants' knowledge of their community, discipline, or commodity so when called upon to lead will understand their industry, organization, or discipline at higher level. Leadership education is often the most lacking part of leadership development programs.

The authors of this study focus on what participants say they gain, networking with other participants. Talk to anyone who has gone through these programs and they will say the best part of the program was the time spent in hotel hallways and foyers exchanging ideas. The authors take that concept one-step further, and concentrate their inquiry on the development made BETWEEN participants. The authors' goal is to capture and report some impact and outcome data for a particular leadership development program.

Nearly the entire 30 program participants responded to a questionnaire designed to measure their familiarity with each other before the program began. Briefly, the authors found a number of the participants to be already familiar with each other, while another group began the program as "isolates", having no opinion leadership among others in the group.

Many questions come to mind as I prepare these remarks.

- How intentional is the recruitment effort or selection process in identifying individuals with the **potential** for leadership as opposed to those already in leadership positions?
- How effective is the program in securing participation from individuals that represent a broad and diverse cross-section of the agricultural industry?
- How effective is the program in securing participation by underrepresented groups?
- Finally, if the **goal of the participants** is to increase participants' social capital, how does the program help them meet their goal?

The authors point out that their findings are of most value to the program director, as it will provide insight as they work with these 30 individuals, well put. The data does provide a solid baseline from which future programs can be measured.

**ALTERNATE PAPERS**

# **A Canon of Classics: Foundational Readings for Doctoral Students in the Broad Discipline of Agricultural Education**

Sharon Wagner, Texas A&M University  
Tracy Rutherford, Texas A&M University

## **Abstract**

*The process of preparing a sufficient scientific and professional workforce begins with effective agricultural education programs. The discipline is broad and encompasses many subdisciplines, including communications, extension, international development, leadership, and pre-service teaching. The purpose of this study was to extend the work of Shinn, Briers, and Baker (2008) by providing a foundational reading list covering all contexts of agricultural education in its broadest sense. We used bibliometric analysis to examine the influence of individual social scientists on agricultural research and to identify those specific publications exerting the most significant impact on the broad discipline of agricultural education. Our database includes the complete reference section of every research article published in the Journal of Agricultural Education, Journal of Applied Communication, Journal of International Agricultural and Extension Education, Journal of Extension, and Journal of Leadership Education during the ten-year period 2008 through 2017. We compiled a recommended reading list for doctoral students based on highly referenced citations occurring in all five premier agricultural education journals. Doctoral students should familiarize themselves with items on the list and supplement their understanding of the discipline with the highly referenced books and journal articles within their subdiscipline, which are also provided.*

## **Introduction and Literature Review**

The challenges facing the agricultural industry have become increasingly broad and multifaceted. From meeting the growing global demands for food, fuel, and fiber, to communicating scientific concepts to a disconnected public, to navigating complex legislative and economic policies, ensuring the industry is prepared to and capable of addressing these challenges is of critical importance in every sector of the agricultural industry and for all aspects of agricultural education (Stripling & Ricketts, 2016). Agricultural education programs must similarly adapt to keep pace.

Addressing the complex economic, social, and environmental challenges related to agriculture is dependent upon our ability to prepare a sufficient scientific and professional workforce that understands the multidisciplinary nature of agriculture and is diverse, globally competent, and possesses 21st century skill (Stripling & Ricketts, 2016, p. 3).

The process of preparing a sufficient scientific and professional workforce begins with effective agricultural education programs. Shinn, Briers, and Baker (2008) noted that “doctoral preparation is critical for the future of any field of study” (p. 122). Thoron, Myers, and Barrick (2016) assert, “graduate education in agricultural education has in many respects been the ‘silent

partner' alongside undergraduate teacher preparation programs" (p. 45). Numerous research studies on doctoral programs, student competencies, and graduate satisfaction have been conducted. Studies on how students in those programs attain those competencies are not available. This study was designed to begin that process.

Graduate student research is expected to be based on a strong theoretical foundation and a synthesis of relevant literature (Williams, 1997). Which theories are foundational, and as such, should be considered required reading for graduate students in agricultural education programs? The discipline is broad and encompasses many subdisciplines, including communications, extension, international development, leadership, and pre-service teaching. Are our foundational theories contextual, or 'interdisciplinary'? Are some research methods more useful than others within and across the discipline? Doctoral students are expected to have a deep understanding of theoretical and methodological connections among the subdisciplines (Shinn et al., 2008). Is there evidence of these connections within the literature?

Some scholars have approached agricultural education's disciplinary foundation (e.g., Barrick, 1989; Birkenholz, Harbstreet, & Law, 1990; Buriak & Shinn, 1989, 1993; Hamlin, 1977; Lindner & Dooley, 2002; Love, 1989; McCracken, 1983; Miller, 2006; Radhakrishna & Xu, 1997; Shinn, 1994; Silva-Guerrero & Sutphin, 1990; Warmbrod, 1987; Williams, 1991). Each of these studies provided broad recommendations for the knowledge domains included in the graduate curriculum. In particular, Shinn et al. (2008) conducted a Delphi study to define the broad discipline of agricultural education and to create a model for doctoral curriculum in agricultural education. Simon, Haygood, Akers, Doerfert, Davis, and Bullock (2005) conducted a similar study on developing master's level curriculum in agricultural communications. Edgar and Rutherford (2011) examined the *Journal of Applied Communications* during 1997-2006. They highlighted the importance of analyzing the literature to understand our scientific discipline and to identify gaps in our knowledge base.

Analyzing literature citations adds to the understanding and the identification of the literature base of agricultural communications. In an effort to better understand where the agricultural education discipline is securing information to support the contexts of the broad disciplinary areas identified in the NRA, content analysis can be used to analyze literature cited. To better understand the scope and impact of agricultural communications on the agricultural education discipline, the journal identified as premier for the agricultural communications disciplinary area (*JAC*) should be analyzed. (Edgar et al., 2008, p. 35).

While this study looked specifically at agricultural communications, these principles are even more important when considering the broad discipline of agricultural education. Edgar and Rutherford (2008) also noted the scarcity of research in this area. Radhakrishna, Eaton, Conroy, and Jackson (1994) conducted the first known study to quantify cited literature in the *Journal of Agricultural Education* and little attention has been given since. Other scholars have examined current authors, research, and themes within one or more subdisciplines (e.g., Edgar, Rutherford, & Briers, 2008; Miller, Stewart, & West, 2006; Moore, 1991). The efforts of these scholars provide the foundation for this study. This study is the first to address the gap for the discipline as a whole and examine research across the broad discipline of agricultural education.

## Conceptual Framework and Purpose of Study

Shinn et al. (2008) recommended the following knowledge base for doctoral students in the broad discipline of agricultural education:

The knowledge base for agricultural education—2010 includes planning and needs assessment; curriculum development; learning theory; instructional design; delivery strategies; evaluation; research methods and tools; scholarship and writing; history, philosophy, and ethics; and contextual applications, culture, and diversity—all effecting continual improvement. (Shinn et al., 2008, p. 124).

However, what Shinn et al. (2008) did not provide were recommendations for imparting this knowledge base to doctoral students. The curation of a foundational reading list for doctoral students in the broad discipline of agricultural education is one means for imparting this knowledge base. Our research sought to extend the work by Shinn et al. (2008) by identifying the journal articles, chapters, and books that embody the foundational models and theories for agricultural education and its subdisciplines, individually and collectively. The creation of a foundational reading list covering all contexts of agricultural education in its broadest sense provides a basis for doctoral education in modern agricultural education. This study addresses research priority five of the American Association of Agricultural Educators' national research agenda, efficient and effective agricultural education programs (Roberts, Harder, & Brashears, 2016).

## Methods

Bibliometric analysis has been widely used in a wide variety of disciplines (Velasco-Muñoz, Aznar-Sánchez, Belmonte-Ureña, & López-Serrano, 2018) and is an important evaluation tool that can be used to examine the seminal works or historical roots of a scientific discipline (Bornmann, Thor, Marx, & Leydesdorff, 2016). The process of tracking citation counts and their trends is frequently used to evaluate both the quality and the true impact of research (Garfield, 1955; Kollo, Shankarappa, & Ho, 2016; Radhakrishna, 1995). Most journals employ a process of peer review to determine if a manuscript is of sufficient quality for publication. Citations reflect the value scientists place on a contribution to their discipline and provide an objective method for evaluating individual researchers' contributions to the development of knowledge within a discipline (Chandy & Williams, 1994; Okubo, 1997). The greater the number of citations, the greater the acknowledged impact of the contribution. As a combination of peer review and quantitative analysis, bibliometric analysis puts an academic's work in context. According to Thomson Reuters (2008), "Weighted quantitative measures, such as papers per researcher or citations per paper, remove characteristics, such as the place of production or past reputation, that color human perceptions of quality" (p. 3). Bibliometric indicators, such as citation counts, are often used in funding decisions, appointments, and promotions of researchers (Durieux & Gevenois, 2010).

In this study, we used bibliometric analysis, more specifically citation analysis, to examine the influence of individual social scientists on the broad discipline of agricultural education research and to identify those specific publications exerting the greatest impact on the

discipline. In a cited reference analysis, all cited references from a discipline-specific publication set are extracted and analyzed to determine which papers, scientists, topics, and/or journals have been cited most often and in which years (Bornmann et al., 214). This process is also useful for identifying key drivers in a scientific discipline (Marx & Bornmann, 2014; Okubo, 1997).

In 2008, Edgar and Rutherford identified the *Journal of Agricultural Education (JAE)*, *Journal of Applied Communication (JAC)*, *Journal of International Agricultural and Extension Education (JIAEE)*, *Journal of Extension (JOE)*, *Journal of Leadership Education (JOLE)*, and *North American Colleges and Teachers of Agriculture Journal (NACTA)* as the premier journals in the discipline. Based upon brief interviews with current faculty in the broad discipline of agricultural education, these journals appear to retain their premier status today. As *NACTA* is primarily focuses on the scholarship of teaching, we chose to omit *NACTA* from this study. To identify the authors and texts that currently exert the greatest influence on the development of agricultural education and its many subdisciplines, our database included the complete reference section of every research article published in the *JAE*, *JAC*, *JIAEE*, *JOE*, and *JOLE* during the ten-year period 2008 through 2017. Most of these journals are not indexed in the Web of Science or similar databases which limits their access. References were manually extracted from articles. Cited references were aggregated across misspellings and variants. Previous bibliometric analyses and content analyses informed the categories we used for our own analyses. We coded for the journal name, publication year, authors, titles, publication type, concepts and theories, and methods. All data were analyzed in Microsoft Excel Professional 2016. The data reported in this study are part of a larger research project that aims to develop specific curriculum recommendations for the knowledge domains identified by Shinn et al. (2008).

### Findings

A total of 44,337 references were extracted from 2,356 articles published in the *Journal of Agricultural Education*, *Journal of Applied Communication*, *Journal of International Agricultural and Extension Education*, *Journal of Extension*, and *Journal of Leadership Education* during 2008-2017. Table 1 below displays a summary of the total numbers of articles and references broken down by journal source.

Table 1

*Summary of cited references extracted from agricultural journals published 2008 – 2017*

Journal Name	Number of	
	Articles	References
Journal of Agricultural Education	588	7,430
Journal of Applied Communications	251	5,615
Journal of Extension	919	15,736
Journal of International Agricultural and Extension Education	230	3,997
Journal of Leadership Education	368	11,599

*Note:* A total of 2,356 articles, containing 44,377 citations, were published during 2008-2017.

## Journal of Agricultural Education

A total of 7,430 references were cited in 588 articles published in *JAE* during 2008-2017. Of the authors cited in *JAE*, Roberts made the greatest contribution to agricultural education during the examined time period. He was cited in nearly one fifth of all articles (18.197%, n=107). Doerfert was the second most cited author (14.456%, n=85). Table 2 presents the five most frequently cited first authors in *JAE* from 2008 through 2017.

Table 2

*The five most frequently cited first authors in articles published in the Journal of Agricultural Education 2008 – 2017*

Author	<i>f</i>	% Articles	% References
Roberts, T. G.	107	18.197	1.440
Doerfert, D. L.	85	14.456	1.144
Bandura, A.	69	11.735	0.929
Dillman, D. A.	63	10.714	0.848
National FFA Organization	56	9.524	0.754

*Note:* A total of 7,430 publications were cited in 588 articles during 2008-2017.

Book editions were aggregated into a single entry. The American Association for Agricultural Education's national research agenda was the most cited publication during the examined time period. It was cited 82 times (13.946%). Dillman, Smyth, and Christian's "Tailored Design Method" was the second most cited publication (10.714%, n=63). Six of the top ten most cited publications focused on research design and analysis; one focused on theory. Table 3 presents the five most frequently cited publications in *JAE* from 2008 through 2017.

Table 3

*The five most frequently cited publications in the Journal of Agricultural Education 2008 – 2017*

Title	<i>f</i>	% Articles	% References
Doerfert, D. L. (Ed.) (2011). <i>National research agenda: American Association for Agricultural Education's research priority areas for 2011-2015</i> . Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communication	82	13.946	1.104
Dillman, D. A. (2009). <i>Mail and internet surveys: The tailored design method</i> (3rd ed.). New York, NY: John Wiley & Sons, Inc.	63	10.714	0.848
Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. <i>Journal of Agricultural Education</i> , 42(4), 43-53.	38	6.463	0.511

Ary, D., Jacobs, L. C. Razavieh, A., & Sorensen, C. (2006). <i>Introduction to research in education</i> (7th ed.). Belmont, CA: Wadsworth Publishing	38	6.463	0.511
Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). <i>Handbook on agricultural education in public schools</i> (6th ed.). Clifton Park, NY: Thompson Delmar Learning.	32	5.442	0.431

*Note:* A total of 7,430 references were cited in 588 during articles during 2008-2017. Books were aggregated into a single entry. The most recent edition of books cited are shown.

### Journal of Applied Communications

A total of 5,615 references were cited in 251 articles published in *JAC* during 2008-2017. Of the authors cited in *JAC*, Doerfert made the greatest contribution to agricultural communications during the examined time period. He was cited in one fifth of all articles (21.912%, n=55). Creswell was the second most cited author (13.147%, n=33). Table 4 presents the six most frequently cited first authors in *JAC* from 2008 through 2017.

Table 4

*The six most frequently cited first authors in the Journal of Applied Communications 2008 – 2017*

Author	<i>f</i>	% <i>articles</i>	% <i>references</i>
Doerfert, D. L.	55	21.912	0.980
Creswell, J. W.	33	13.147	0.588
Grunig, J. E.	27	10.757	0.481
Ary, D.	26	10.359	0.463
Telg, R.	26	10.359	0.463
Irlbeck, E. G.	26	10.359	0.463

*Note:* A total of 5,615 references were cited in 251 during articles during 2008-2017.

Book editions were aggregated into a single entry. The American Association for Agricultural Education’s national research agenda was the most cited publication during the examined time period. It was cited 31 times (12.351%). Creswell’s “Qualitative Inquiry and Research Design: Choosing among Five Approaches” was the second most cited publication (10.757%, n=27). Five of the top ten most cited publications focused on research design and analysis. Only one focused on theory. Table 5 presents the five most frequently cited publications in *JAC* from 2008 through 2017.

Table 5

*The five most frequently cited publications in the Journal of Applied Communications 2008 – 2017*

Title	<i>f</i>	% <i>articles</i>	% <i>references</i>
Doerfert, D. L. (Ed.) (2011). <i>National research agenda: Agricultural Association for Agricultural Education's research priority areas for 2011-2015</i> . Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communication	31	12.351	0.552
Creswell, J. W. (2007). <i>Qualitative inquiry and research design: Choosing among five approaches</i> (2nd ed.). Thousand Oaks, CA: Sage Publication, Inc.	27	10.757	0.481
Ary, D., Jacobs, L. C., & Sorensen, C. (2010). <i>Introduction to Research in Education</i> (8th ed.). Belmont, CA: Wadsworth.	26	10.359	0.463
Dillman, D.A., Smyth, J. D., Christian, L.M. (2009). <i>Internet, mail, and mixed-mode surveys: The tailored design method</i> (3rd ed). Hoboken, NJ: John Wiley & Sons, Inc.	23	9.163	0.410
Lincoln, Y. S., & Guba, E. G. (1985). <i>Naturalistic inquiry</i> . Beverly Hills, CA: Sage Publications, Inc.	19	7.570	0.338

*Note:* A total of 5,615 references were cited in 251 during articles during 2008-2017. Books were aggregated into a single entry. The most recent edition of books cited are shown.

### Journal of Extension

A total of 15,736 references were cited in 919 articles published in *JOE* during 2008-2017. Of the authors cited in *JOE*, the United States Department of Agriculture made the greatest contribution to agricultural extension during the examined time period. The USDA was cited in one quarter of all articles (28.074%, n=258). Dillman was second most cited author (15.234%, n=140). Table 6 presents the five most frequently cited first authors in *JOE* from 2008 through 2017.

Table 6

*The five most frequently cited first authors in the Journal of Extension 2008 – 2017*

Author	<i>f</i>	% <i>articles</i>	% <i>references</i>
United States Department of Agriculture	258	28.074	1.640
Dillman, D. A.	140	15.234	0.890
United States Census Bureau	88	9.576	0.559
Centers for Disease Control and Prevention	72	7.835	0.458
Franz, N. K.	60	6.529	0.381

*Note:* A total of 15,736 references were cited in 919 during articles during 2008-2017.

Book editions were aggregated into a single entry. Dillman, Smyth, and Christian’s “Tailored Design Method” was the most cited publication during the examined time period. It was cited 139 times (15.125%). Roger’s “Diffusions of Innovations” was the second most cited publication (4.897%, n=45). Nine of the most cited publications focused on research design and analysis; one focused on theory. Table 7 presents the five most frequently cited publications in *JOE* from 2008 through 2017.

Table 7

*The five most frequently cited publications in the Journal of Extension 2008 – 2017*

Title	<i>f</i>	% articles	% references
Dillman, D.A., Smyth, J. D., Christian, L.M. (2009). <i>Internet, mail, and mixed-mode surveys: The tailored design method</i> (3rd ed). Hoboken, NJ: John Wiley & Sons, Inc.	139	15.125	0.883
Rogers, E. M. (2003). <i>Diffusions of Innovations</i> (5th ed.). New York, NY: The Free Press.	45	4.897	0.286
Miller, L. E., & Smith, K. L. (1983). Handling nonresponse issues. <i>Journal of Extension</i> [On-line], 21(5), Available at: <a href="http://www.joe.org/joe/1983september/83-5-a7.pdf">http://www.joe.org/joe/1983september/83-5-a7.pdf</a>	27	2.938	0.172
Lindner, J. R., Murphy, T. H., & Briers, G.E. (2001). Handling nonresponse in social science research. <i>Journal of Agriculture Education</i> , 42:43–53.	21	2.285	0.113
Krueger, R. (1994). <i>Focus groups: A practical guide for applied research</i> . Newbury Park, CA: Sage Publications, Inc.	19	2.067	0.121

*Note:* A total of 15,736 references were cited in 919 during articles during 2008-2017. Books were aggregated into a single entry. The most recent edition of books cited are shown.

**Journal of International Agricultural and Extension Education**

A total of 3,997 references were cited in 230 articles published in *JIAEE* during 2008-2017. Of the authors cited in *JIAEE*, Swanson made the greatest contribution to international agricultural during the examined time period. He was cited in one fifth of all articles (20.000%, n=46). Rogers was the second most cited author (16.957%, n=39). Table 8 presents the five most frequently cited first authors in *JIAEE* from 2008 through 2017.

Table 8

*The five most frequently cited first authors in the Journal of International Agricultural and Extension Education 2008 – 2017*

Author	<i>f</i>	% articles	% references
Swanson, B. E.	46	20.000	1.151
			464

Rogers, E. M.	39	16.957	0.976
Rivera, W. M.	36	15.652	0.901
Merriam, S. B.	29	12.609	0.726
Lincoln, Y.	26	11.304	0.650

*Note:* A total of 3,997 references were cited in 230 during articles during 2008-2017.

Book editions were aggregated into a single entry. Roger’s “Diffusion of Innovations” was the most cited publication during the examined time period. It was cited 37 times (16.087%). Lincoln and Guba’s “Naturalistic Inquiry” was the second most cited publication (11.304%, n=26). Six of the cited publications focused on research design and analysis; one focused on theory. Table 9 presents the five most frequently cited publications in *JIAEE* from 2008 through 2017.

Table 9

*The five most frequently cited publications in the Journal of International Agricultural and Extension Education 2008 – 2017*

Title	<i>f</i>	% articles	% references
Rogers, E.M. (2003). <i>Diffusion of innovations</i> (5th ed.). New York, NY: Free Press	37	16.087	0.926
Lincoln, Y., & Guba, E. (1985). <i>Naturalistic inquiry</i> . Newbury Park, CA: Sage Publications	26	11.304	0.650
Merriam, S.B., (2009). <i>Qualitative Research: A Guide to Design and Implementation</i> . San Francisco, CA: Jossey-Bass	23	10.000	0.575
Creswell, J.W. (1998). <i>Qualitative Inquiry and Research Design: Choosing Among Five Traditions</i> . Thousand Oaks, CA: Sage Publications, Inc.	14	6.087	0.350
Patton, M.Q. (2002). <i>Qualitative research &amp; evaluation methods</i> (3rd ed). Thousand Oaks, CA: Sage Publications, Inc.	12	5.217	0.300

*Note:* A total of 3,997 references were cited in 230 during articles during 2008-2017. Books were aggregated into a single entry. The most recent edition of books cited are shown.

### Journal of Leadership Education

A total of 11,599 references were cited in 368 articles published in *JOLE* during 2008-2017. Of the authors cited in *JOLE*, Komives made the greatest contribution to leadership education during the examined time period. She was cited in nearly half of all articles (43.207%, n=159). Dugan was the second most cited author (36.141%, n=133). Table 10 presents the five most frequently cited first authors in *JOLE* from 2008 through 2017.

Table 10

*The five most frequently cited first authors in the Journal of Leadership Education 2008 – 2017*

Author	<i>f</i>	% <i>articles</i>	% <i>references</i>
Komives, S. R.	159	43.207	1.371
Dugan, J. P.	133	36.141	1.147
Bass, B. M.	110	29.891	.948
Astin, A. W.	101	27.446	.871
Kouzes, J. M.	98	26.630	.845

*Note:* A total of 11,599 references were cited in 368 during articles during 2008-2017.

Book editions were aggregated into a single entry. Northhouse's "Leadership: Theory and Practice" was the most cited publication during the examined time period. It was cited 66 times (17.935%). Kouzes and Posner's "The Leadership Challenge: How to Make Extraordinary Things Happen in Organizations" was the second most cited publication (16.304%, n=60). Unlike the other journals, highly cited publications within *JOLE* did not focus on research design and analysis. Instead, they focused on the application of a specific theory or framework, or presented a summary of leadership theory in general. Table 11 presents the five most frequently cited publications in *JOLE* from 2008 through 2017.

Table 11

*The five most frequently cited publications in the Journal of Leadership Education 2008 – 2017*

Title	<i>f</i>	% <i>articles</i>	% <i>references</i>
Northouse, P. G. (2015). <i>Leadership: Theory and practice</i> (7th ed.). Thousand Oaks, CA: Sage Publishing, Inc.	66	17.935	.569
Kouzes, J. M., & Posner, B. Z. (2012). <i>The leadership challenge: How to make extraordinary things happen in organizations</i> (5th ed.). San Francisco, CA: Jossey-Bass.	60	16.304	.517
Kolb, D. (1984). <i>Experiential learning: Experience as the source of learning and development</i> . Englewood Cliffs, NJ: Prentice Hall.	47	12.772	.405
Astin, A. W., & Astin, H.S. (2000). <i>Leadership reconsidered: Engaging higher education in social change</i> . Battle Creek, MI: W. K. Kellogg Foundation.	45	12.228	.388
Komives, S. R., Lucas, N., & McMahon, T. R. (2007). <i>Exploring leadership: For college students who want to make a difference</i> . San Francisco, CA: Jossey-Bass.	43	11.685	.371
			466

Note: A total of 11,599 references were cited in 368 during articles during 2008-2017. Books were aggregated into a single entry. The most recent edition of books cited are shown.

### Across the Journals

We then aggregated the references that occurred in the data from all five journals and examined them for their impact on the broad discipline of agricultural education. The American Association for Agricultural Education’s national research agenda was the most cited publication during the examined time period. It was cited 151 times (6.409%). Dillman, Smyth, and Christian’s “Tailored Design Method” was the second most cited publication (5.857%, n=138).

Table 12

*The five most frequently cited publications across five agricultural education journals during 2008 – 2017*

Title	<i>f</i>	% articles	% references
Doerfert, D. L. (Ed.) (2011). <i>National research agenda: American Association for Agricultural Education’s research priority areas for 2011-2015</i> . Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.	151	6.409%	0.340%
Dillman, D. A., Smyth, J. D., Christian, L. M., (2009). <i>The tailored design method: Internet, mail, and mixed-mode surveys</i> (3rd ed.). Hoboken, NJ: John Wiley & Sons, Inc	138	5.857%	0.311%
Creswell, J. (2007). <i>Qualitative inquiry &amp; research design: Choosing among the five approaches</i> . Thousand Oaks, CA: Sage Publications, Inc.	106	4.499%	0.239%
Lincoln, Y. S., & Guba, E. G. (1985). <i>Naturalistic inquiry</i> . Newbury Park, CA: Sage Publications.	103	4.372%	0.232%
Ary, D, Jacobs L.C., Razavieh, A., & Sorensen C. (2006). <i>Introduction to research in education</i> (7th ed.). Belmont, CA: Thomson Wadsworth.	100	4.244%	0.225%

Note: A total of 44,377 references were cited in 2,356 during articles during 2008-2017. Books were aggregated into a single entry. The most recent edition of books cited are shown.

Fifteen of the top twenty most cited publications focused on research design and analysis; three focused on theory. Table 12 presents the five most frequently cited publications in *JAE*, *JAC*, *JOE*, *JIAEE*, and *JOLE* from 2008 through 2017. The most frequently cited publications by type are shown below in Figure 1, as determined by natural frequency breaks. The book references were adjusted to reflect the most recent editions.

## Books

- Ary, D, Jacobs L.C., Razavieh, A., & Sorensen C. (2018). *Introduction to research in education* (10th ed.). Belmont, CA: Thomson Wadsworth.
- Creswell, J.W. (2017). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Dillman, D.A., Smyth, J.D., Christian, L.M. (2014). *The tailored design method: Internet, mail, and mixed-mode surveys* (4th ed.). Hoboken, NJ: John Wiley & Sons, Inc.
- Field, A. (2018). *Discovering statistics using IBM SPSS Statistics: North American edition* (5th ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Fraenkel, J. R., & Wallen, N. E. (2014). *How to design and evaluate research in education* (9th Ed.). New York, NY: McGraw-Hill.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: The Free Press.

Figure 1. Most frequently cited books across *JAE*, *JAC*, *JOE*, *JIAEE*, and *JOLE* during 2008 - 2017

## Journal Articles

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211. doi:10.1016/0749–5978(91)90020–T
- Baker, R., Brick, J.M., Bates, N.A., Battaglia, M., Couper, M.P., Dever, J.A., et al. (2013). Report of the AAPOR task force on non-probability sampling. American Association for Public Opinion Research. Retrieved at <http://www.aapor.org/AM/Template.cfm?Section=Reports1&Template=/CM/ContentDisplay.cfm&ContentID=5963>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Borich, G. D. (1980). A needs assessment model for conducting follow-up studies (1980) *Journal of Teacher Education*, 31(3), pp. 39-42. doi: 10.1177/002248718003100310
- Crawford, P., Lang, S., Fink, W., Dalton, R., & Fielitz, L. (2011). *Comparative analysis of soft skills: What is important for new graduates?* Washington, DC: Association of Public and Land-grant Universities.
- Dooley, K. E. (2007). Viewing agricultural education through a qualitative lens. *Journal of Agricultural Education*, 48(4), pp. 32-42
- Dyer, J. E., Haase-Wittler, P. S., & Washburn, S. G. (2003). Structuring agricultural education research using conceptual and theoretical frameworks. *Journal of Agricultural Education*, 44(2), 61-74.

Glaser, B. G. (1965). The constant comparative method of qualitative analysis. *Social Problems*, 12, 436 - 445.

Kalton, G. & Flores-Cervantes, I. (2003). Weighting methods. *Journal of Official Statistics*, 19(2), 81-97. Retrieved from <http://www.jos.nu/articles/article.asp>

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

Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53. doi:10.5032/jae.2001.04043

Miller, L. E., & Smith, K. L. (1983). Handling nonresponse issues. *Journal of Extension*, 21(5), 45-50. Retrieved from <http://www.joe.org/joe/1983september/83-5-a7.pdf>

Figure 2. Most frequently cited journal articles across *JAE*, *JAC*, *JOE*, *JIAEE*, and *JOLE* during 2008 - 2017

### Conclusions

The purpose of this study was to extend the work by Shinn et al. (2008) by providing graduate faculty mentors with a foundational reading list for doctoral students. A bibliometric analysis elucidated the preeminent, foundational publications across all contexts of agricultural education in its broadest sense, as well as emerging contemporary researchers who are actively shaping the discipline today. As the first study to examine scholarship both within and across the subdisciplines of agricultural education, the results of this study can serve to shape future programming for doctoral education.

Of particular note, however, is what was *not* in the findings. There did not appear to a distinct line of inquiry that defined the discipline, or any of the subdisciplines, during this time period. Research topics varied widely, even within the subdisciplines. Key methodology and procedural texts, as expected, appeared frequently. However, Williams (1997) noted that graduate student research should be based on a strong theoretical foundation. We found very little theory or philosophy cited in the references of the five premier journals in the broad discipline of agricultural education. Graduate faculty should consider placing a greater emphasis on theory and philosophy in doctoral programming. A theoretical framework not only guides a research project, it also guides a scientific discipline. Without one, agricultural education cannot have a clear identity nor a firm foundation.

### Recommendations

Doctoral students should be familiar with the references shown in Figures 1 and 2 (above) and to supplement their understanding of the discipline with the highly referenced books and journal articles within their specific subdiscipline (Tables 2-11 above). Doctoral students should also be familiar with the research agenda for their specific subdiscipline. Websites and agency publications were frequently used to provide supplemental content and context for research projects. Organizations such as the Centers for Disease Control and Prevention, Farm Bureau, United States Census Bureau, and United States Department of Agriculture were among

the most frequently used sources by researchers in agricultural education. Doctoral students should be referred to these organizations, and others specifically used within their subdiscipline, as viable sources for context and supplemental content.

### **Limitations and Future Research**

The journals we examined were not indexed in databases, such as the Web of Science. As such, we had to extract all data manually. The opportunity for human error to occur in this process is undeniable. However, the processing of data manually also provided the opportunity to discover the frequency of citation errors within the raw data, such as reversed or incorrect initials in author names, which would have been overlooked in a computerized process. These errors were corrected to the best of our ability, but the possibility remains that some references and/or authors may be slightly underrepresented in our findings. We did not control for self-citation, which may explain the relatively higher number of more recent author works. As researchers tend to build upon their previous research projects, a certain amount of self-citation is expected within the literature. Previous examinations of self-citation found that there is little change to relative rank of when self-citations are removed from consideration (Chandy & Williams, 1994; McVeigh, 2002). Editors may have tacit expectations that reference sections include articles published in their journal. As such, some authors may have included less relevant references from that journal in order to demonstrate previous engagement with the journal. McVeigh (2002) noted nearly every journal contains at least some reference to its own previous literature.

Future research should examine the theories, methods, and themes of agricultural education as a broad discipline of science. Such examination would further illuminate the foundational base for doctoral student knowledge. It would also provide an illustrative demonstration of opportunities for doctoral student research to expand both the depth and breadth of knowledge in this discipline.

### **References**

- Barrick, R. K. (1989). Agricultural education: Building upon on roots. *Journal of Agricultural Education, 30*(4), 24-29.
- Birkenholz, R. J., Harbstreet, S. R., & Law, D. A. (1990). Research priorities for adult education in agriculture in the north central region. *Journal of Agricultural Education, 31*(3). 23-38.
- Buriak, P., & Shinn, G. C. (1989). Mission, initiative, and obstacles to research in agricultural education: A national Delphi using external decision –makers. *Journal of Agricultural Education, 30*(4), 14-23.
- Buriak, P., & Shinn, G. C. (1993). Structuring research for agricultural education: A national Delphi involving internal experts. *Journal of Agricultural Education, 32*(2), 31-36.
- Chandy, P. R., & Williams, T. G. (1994). The impact of journals and authors on international business research: A citational analysis of JIBS articles. *Journal of International Business Studies, 25*(4), 715-728.

- Durieux, V., & Gevenois, P. A. (2010). Bibliometric indicators: Quality measurements of scientific publication. *Radiology*, 255(2), 342-351.
- Edgar, L. D., Rutherford, T., & Briers, G. E. (2008). The Journal of International Agricultural and Extension Education: A Ten Year Look. Proceedings of the 24th Annual Meeting of the Association for International Agricultural and Extension Education, EARTH University, Costa Rica.
- Edgar, L. D., Edgar, D. W., Briers, G. E., & Rutherford, T. (2008a). Research themes, authors, and methodologies in the Journal of Agricultural Education: A ten year look. *Journal of Southern Agricultural Education Research*, 58(1), 44.
- Edgar, L. D., Briers, G. E., & Rutherford, T. (2008b). Research themes in agricultural education: Future gap analysis of the National Research Agenda. *Journal of Southern Agricultural Education Research*, 58(1), 61.
- Garfield, E. (1955). Citation indexes for science: A new dimension in documentation through association of ideas. *Science*, 122, p. 108-111.
- Hall, C. M. (2011). Publish and perish? Bibliometric analysis, journal ranking and the assessment of research quality in tourism. *Tourism Management*, 32(1), 16-27.
- Hamlin, H. M. (1966). What is research? Not only to count, but to be willing to judge. *American Vocational Journal*, 41(6), 14-16.
- Kolle, S. R., Shankarappa, T. H., & Ho, Y. S. (2017). Highly cited articles in science citation index expanded – Subject category of horticulture: A bibliometric analysis. *Erwerbs-Obstbau*, 59(2), 133-145. doi: 10.1007/s10341-016-0308-4
- Lindner, J. R., & Dooley, K. E. (2002). Agricultural education competencies and progress toward a doctoral degree. *Journal of Agricultural Education*, 43(1), 57-68.
- Love, G. M. (1978). An introduction to the philosophy of agricultural education. *Journal of the American Association of Teacher Educators in Agriculture*, 17(1), 2-10, 28.
- McCracken, J. D. (1983). A profession in need of academicians. *Journal of the American Association of Teacher Educators in Agriculture*, 24(1), 2-12.
- McVeigh, M. (2002). Journal self-citation in the Journal Citation Reports – Science Edition. Retrieved from <https://clarivate.com/essays/journal-self-citation-jcr>
- Miller, J. D., Stewart, D. M., & West, L. M. (2006). Themes, authors, and citations in the Journal of Applied Communications, 2000-2004. Proceedings of the 2006 SAAS Agricultural Communications Section Meeting, Orlando, FL.
- Miller, L. E. (2006). A philosophical framework for agricultural education research. *Journal of Agricultural Education*, 47(2), 106-117.
- Moore, G. (1991). How firm is the foundation? A look at the knowledge base in agricultural education research. Proceedings of the 18th Annual National Agricultural Education Research Meeting, 151-157. Los Angeles, CA.

- Okubo, Y. (1997). Bibliometric indicators and analysis of research systems: Methods and examples. *OECD Science, Technology and Industry Working Papers*, No. 1997/01. OECD Publishing, Paris. Retrieved from <https://doi.org/10.1787/208277770603>
- Pritchard, A. (1969). Statistical bibliography or bibliometrics. *Journal of documentation*, 25(4), 348-349.
- Radhakrishna, R. B., & Xu, W. (1997). A review of subject matter topics research in agricultural and extension education. *Journal of Agricultural Education*, 38(3), 59-69.
- Radhakrishna, R. B. (1995). Core journals used by agricultural and extension educators. *Journal of Agricultural Education*, 36(4), 48-54.
- Radhakrishna, R. B., Eaton, D., Conroy, C., & Jackson, G. (1994). An empirical analysis of literature cited in the Journal of Agricultural Education. *Journal of Agricultural Education*, 35(1), 61-65.
- Thomson Reuters. (2008). Using bibliometrics: A guide to evaluating research performance with citation data. Retrieved from [http://ip-science.thomsonreuters.com/m/pdfs/325133\\_thomson.pdf](http://ip-science.thomsonreuters.com/m/pdfs/325133_thomson.pdf)
- 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.
- Shinn, G. C., Briers, G., & Baker, M. (2008) Forecasting doctoral-level content in agricultural education: Viewpoints of engaged scholars in the United States. *Journal of Agricultural Education*, 49(1), 121-131.
- Shinn, G. C. (1994). Field notes: A topographical survey of our professional society. *Journal of Agricultural Education*, 35(1), 1-4.
- Silva-Guerrero, L., & Sutphin, H. D. (1990). Priorities for research in agricultural education. *Journal of Agricultural Education*, 31(3), 2-13.
- Stripling, C. T. & Ricketts, J. C. (2016). Research priority 3: Sufficient scientific and professional workforce that addresses the challenges of the 21st century. 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.
- Thomson Reuters. (2008). Using bibliometrics: A guide to evaluating research performance with citation data. Retrieved from [http://ip-science.thomsonreuters.com/m/pdfs/325133\\_thomson.pdf](http://ip-science.thomsonreuters.com/m/pdfs/325133_thomson.pdf)
- Thoron, A. C., Myers, B. E., & Barrick, R. K. (2016). Research priority 5: Efficient and effective agricultural education programs. In . 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.

- Warmbrod, J. R. (1987) The future of agricultural education in secondary schools: Barriers to change. *The Agricultural Education Magazine*, 60(4), 4.
- Williams, D. L. (1991). Focusing agricultural education research: Strategies for the discipline. *Journal of Agricultural Education*, 32(1), 7-12.
- Williams, D. L. (1997). Focusing agricultural education research: An agenda for the graduate student. *Journal of Agricultural Education*, 38, 28-35.
- Wray, K. B., & Bornmann, L. (2015). Philosophy of science viewed through the lense of “Referenced Publication Years Spectroscopy”(RPYS). *Scientometrics*, 102(3), 1987-1996.

## **Communicating with Elected Officials: County Commissioners' Communication Preferences and Factors Impacting Agriculture Policy Decisions**

Kati Lawson, University of Florida  
Kevin Kent, University of Florida  
Ricky Telg, University of Florida  
Shelli Rampold, University of Florida  
Ashley McCleod, University of Florida

### **Abstract**

*Elected officials at the local, state, and national levels play key roles in shaping the agriculture and natural resources (ANR) sectors through the development and implementation of ANR policies and regulations. As such, it has become necessary for members of the ANR community to understand the policy formation process and how to communicate effectively with elected officials about ANR policies and issues. However, little research has been conducted at the local levels to examine how local elected officials (LEOs) interact with information specific to ANR policies to make decisions. As such, this study was designed to assess the communication and information-seeking preferences and behaviors of LEOs that impact their decisions about ANR issues and policies. Of the sources of communication considered by LEOs when making ANR policy decisions, respondents in this study identified communication from farmers and ranchers as having the highest impact on their decision-making. This finding supports the use of farmers and ranchers as opinion leaders in impacting ANR policies. LEOs in this study also reported they would seek factual information from multiple sources to understand the positive and negative impact of the ANR policy before casting their vote, which holds positive implications for members of the ANR sector when communicating with their LEOs. The ability to generalize the findings of this study is limited, and the need for future research is warranted. Specifically this study should be replicated with LEOs in other areas, as well as elected officials at the state and national levels.*

Key terminology: Agriculture and natural resources, communication, county commissioners, policymaking

### **Introduction**

The agricultural industry in Florida is substantial, accounting for roughly \$4 billion in U.S. exports from more than 47,000 farms spanning across nearly 9.5 million acres (Florida Department of Agriculture and Consumer Services, 2018). Elected officials at the local, state, and national levels create and make decisions about policies and laws that can impact agriculture and natural resources (ANR) sectors and, therefore, play a key role in shaping the industry (Effland, 2000; (Florida Farm Bureau, 2018; Salazar, 2015). As such, it has become increasingly important for organizations and individuals involved in the ANR sectors to understand the policy

formation process and how to communicate with elected officials (Effland, 2000). This is especially true at the local level as the U.S. government leaves many decisions to the local governments as part of an effort to turn policymaking decisions back to states and localities such as county commission boards, therefore placing significant responsibilities on state and local governments (Hanson, R., 1998). Local elected officials (LEOs) thus function as part of the larger political system through their responsibilities making informed decisions that impact their local constituents (Hanson, 1998). While LEOs must have the necessary knowledge to make difficult decisions in their community on a regular basis, they are often elected due to their community ties, rather than their professional knowledge (Berry, Markee, Stewart, & Giewa, 1996). As stated by Berry et al. (1996):

Local elected officials typically are long-time residents who are elected because of the breadth of their personal contacts in the community and the esteem in which they are held locally. Their contribution to local government is based not on their knowledge or experience in dealing with the technical issues of government administration but rather on their ability to reflect community values in policy discussions and to work with local residents in building support for needed public policy changes (pp. 1089).

In the area of agriculture and natural resources (ANR), policy decisions made by LEOs can potentially affect production practices and revenue of Florida agricultural operations. For example, there have been many cases in Florida where agricultural lands have been considered for rezoning to mixed commercial or commercial due to Florida's popularity as a destination to both live and vacation (Palm Beach Board of County Commissioners). Decisions of this nature are handled by county commissions. The April 26, 2017 [County] Board of County Commissioners meeting section 3.A.2 illustrated an example of how policy can affect agricultural land and future production. The case presented involved a request to change zoning of 37.99+/- acres in Palm Beach County from agriculture residential to mixed development zoning. The change in zoning allowed for a movie theatre and drive-through restaurant to be placed on the land and was approved by six of the seven county commissioners. As a result of the rezoning, the agricultural land was taken out of production.

The job of local elected officials (LEOs) is complex, demanding, and complicated due to the fact LEOs make decisions loaded with the potential to impact people in the areas they serve (Vogelsang-Coombs & Miller, 1999). LEOs are bound not only by the governances of the position, but also by relationships they form with constituents (Vogelsang-Coombs & Miller, 1999). As such, communicating concerns to elected officials and voting populations can be effective in influencing policy decisions. In 1968, Napa County, California zoned 23,000 acres with an agricultural designation for wineries, agricultural operations, and homes on 20 plus acre parcels. County voters concerned about urban sprawl voted to limit population growth in the area require a countywide vote for any changes regarding zoning in the preserve. These efforts allowed Napa County to become a famous agro-tourism destination (Daniels, 2018). Such circumstances present the need to examine the process of how ANR policies are put into place, including how county commissioners prepare to vote on an ANR policies and factors that impact their decision-making when making decisions about ANR policies.

Despite the significant impact LEOs can have on ANR policies and the need to communicate and share information with elected officials regarding ANR issues, little research has been conducted to examine how LEOs interact with information specific to ANR policies. As such, this study was designed to better assess the communication and information-seeking preferences and behaviors of LEOs that impact their decisions about ANR issues and policies.

### **Conceptual Framework and Review of Literature**

Much of the available research in the area of policymaking has not been conducted to specifically examine LEOs' decision-making regarding ANR policies. However, policymaking research in other areas may be transferrable to the ANR context. It is necessary to understand how LEOs gather information and make decisions about ANR policies, as well as their preferred methods of being communicated to about ANR issues. An individual may utilize various processing routes when interpreting new information (Petty & Cacioppo, 1986). Moreover, the individual may make decisions based off of the new information by considering the information with great complexity or by quickly applying heuristics (Petty & Cacioppo, 1986). Research is needed to better understand how information communicated to LEOs may impact their decision-making about ANR policies.

Cairney and Kwiatkowski (2017) provided key insights into the minds of policymakers that may provide some guidelines for communicating ANR information to impact LEOs decision-making about relevant policies. Cairney and Kwiatkowski (2017) acknowledged the overwhelming amount of information policymakers process to make decisions and noted it is extremely difficult to take in all information needed to make informed decisions. As elected officials are tasked with making many decisions within a quick timeframe, policymakers often rely on heuristics to process the overwhelming amount of information they need to make decisions, which causes information to travel through the central route. (Cairney & Kwiatkowski, 2017). Making decisions quickly and without much elaboration is a characteristic of the central route when discussed in the context of information travel (Petty & Cacioppo, 1986). It is important to acknowledge that policymakers make decisions as normal humans, rather than machines that can process extensive information and determine the right answer. As such, policymakers must base their decisions on both cognition and emotion (Cairney & Kwiatkowski, 2017).

Heuristics appear in all forms in the political arena, including party cues and celebrity endorsements (Kam, 2005). When examining how LEOs process information, it is important to consider that the term *celebrity* in the local context takes on different meaning than in a global context. Ferris (2010) described a local celebrity as someone who is known in smaller, more condensed communities. Strategic messengers, such as local celebrities, may thus be effective in sharing information with policymakers. In addition, messengers that appeal to the LEO being communicated to, or messengers that have existing relationships with the LEO, may have the most effective impact when conveying information (Cairney & Kwiatkowski, 2017). Elected officials more often trust information from individuals or organizations with whom they share common characteristics, such as values, beliefs, and backgrounds (Mooney, 1991; Jackson-Elmoore, 2005).

A wide breadth of research related to ANR issues has been made publically available through land grant universities across the United States. However, scientists and academic researchers have faced many barriers when trying to communicate research to lay audiences, including elected officials (Treise & Weigold, 2002). Scientists often use words that are difficult for non-academic professionals to interpret or language that does not resonate with other audiences (Treise & Weigold, 2002; Lundy, Ruth, Telg, & Irani, 2006). Further, research and information does not easily reach policymakers because barriers exist when researchers seek out a policy-driven audience (Oliver, Innvar, Lorenc, Woodman, & Thomas, 2014). Some previously identified barriers to communicating research to policymakers include poor timing, lack of access to research, and information overload were reoccurring barriers regarding policymakers' access to research found in literature (Brownson, Royer, Ewing, & McBride, 2006; Gregrich, 2003; Oliver et al., 2014; Shanley & Lopez, 2009). In the context of this study, communicating ANR information to LEOs may be more effective when messages are framed in a way that appeals to the LEO's interests and corresponds with a problem in society that they have the ability to solve (Cairney & Kwiatkowski, 2017).

Brownson et al. (2006) discussed the issue of time constraints in that research projects can take three to six years to complete, as well as require multiple years to be published for information to be disseminated. Due to the extended time needed to release findings, policymakers are seldom able to wait for the research cycle to complete, which presents a major barrier to using research-based information in policy-making decisions (Brownson et al., 2006). Moreover, Stoker and John (2009) concluded policymakers sometimes dismiss research because it is not available in a format usable and easily understood at the time they need the information to make a decision. When policymakers are engaged throughout the scientific process, policymakers are much more likely to apply research findings to the policy process (Stoker & John, 2009).

Gregrich (2003) found policymakers and practitioners often face scarce resources, such as funding and staff, which may not be taken into account when research findings are reported. As such, elected officials and practitioners can become overwhelmed by the amount of information available and struggle to implement research into problem-solving approaches (Cairney & Kwiatkowski, 2017; Gregrich, 2003). Brownson et al. (2006) recommend researchers, policymakers, and practitioners share the responsibility to address issues impacting society through the application of science. There is a need for research pertaining to how local elected officials make decisions and vote on policies that impact ANR sectors. This study is needed to help practitioners in ANR help agricultural industry members best communicate information to their local elected officials to impact ANR policy decisions.

### **Purpose and Objectives**

The purpose of this study was to examine Florida county commissioners' preferred methods of communication, and the factors that influence their decision-making when making agricultural and natural resource (ANR) policy decisions. The following objectives guided this study:

1. Describe the extent to which communication from select sources impacts Florida county commissioners' decision-making when making ANR policy decisions.

2. Describe how Florida county commissioners prepare to vote on a policy that impacts ANR sectors.
3. Identify Florida county commissioners' preferred methods of being communicated to by their constituents.

## **Methodology**

### **Population and Sample**

The population for this study consisted of all Florida county commissioners who had a viable email at the time the study was conducted ( $N = 285$ ). Responses were collected from 59 of the 285 county commissioners for a 21% response rate. Due to the inability to obtain an adequate sample of nonrespondents for comparisons, nonresponse bias was assessed by comparing early to late respondents (Miller & Smith, 1983). This method has been used frequently in agricultural education research (Lindner, Murphy, & Briers, 2003; Johnson & Shoulders, 2017), as well as been identified as appropriate for addressing nonresponse based on the assumption that late respondents are similar to nonrespondents (Burkell, 2003; Lindner et al., 2003). Two-tailed independent  $t$ -tests were used to determine if statistically significant differences existed between early respondents (those responding prior to the third email) and late respondents on the variables of interest in this study. No significant differences between early and late respondents were found.

County commissioners who participated in this study were predominately male ( $f = 34$ ; 58%), white ( $f = 45$ ; 76%), and earned \$150,000 to \$249,999 ( $f = 17$ ; 29%) or \$75,000 to \$149,999 ( $f = 16$ ; 27%) yearly. In addition, participants held conservative ( $f = 23$ ; 47%) or moderate ( $f = 11$ ; 22.4%) political beliefs and were affiliated with the Republican party ( $f = 35$ ; 70%). More participants lived in a rural area/not a farm ( $f = 18$ ; 31%) or subdivision in a town or city ( $f = 17$ ; 29%) than any other type of residential area. Lastly, participants had been involved in agriculture in the past ( $f = 14$ ; 24%) or had never been in agriculture nor had an immediately family member who is/was involved in agriculture ( $f = 13$ ; 22%). Nine (15%) participants were currently involved in agriculture for a living.

### **Instrument**

An online survey questionnaire was developed by the researchers for the purpose of this study. The questionnaire was reviewed for face and content validity by an expert panel consisting of three agricultural communications faculty members, executive directors from three Florida agricultural organizations, an agricultural organization's policy director, a communication director, and one leadership organization director. Edits were made to refine the inclusion and wording of questionnaire items, as well as to include the neutral midpoint in some response scales for this particular population. The panel deemed the final instrument acceptable. Post hoc reliability estimates for the instrument's constructs were calculated using Cronbach's alpha.

Three sections of the questionnaire were used for data analysis in this study. The first section of the instrument included four items designed to assess factors that impact county commissioners' decision-making when making ANR policy decisions. Respondents were asked

to indicate the degree of impact factors such as “communication from a farmer or rancher” would have on their decision-making about an ANR policy. Responses were collected using a 5-point Likert-type scale: 1 = *no impact*; 2 = *slight impact*; 3 = *moderate impact*; 4 = *high impact*; and 5 = *very high impact*. Real limits were set for the interpretation of responses: 1.00 to 1.49 = *no impact*; 1.50 to 2.49 = *slight impact*; 2.50 to 3.49 = *moderate impact*; 3.50 to 4.49 = *high impact*; and 4.50 to 5.00 = *very high impact*. The internal reliability for this scale was  $\alpha = .64$ .

The second section of the instrument was included to determine how county commissioners prepare to vote on an ANR policies. Respondents were asked to indicate their level of agreement with six items such as “when preparing to vote on a policy that impacts agriculture and natural resources, I would seek factual information.” Responses were collected on a 5-point Likert-type scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *neither agree nor disagree*; 4 = *agree*; and 5 = *strongly agree*. Real limits were set for the interpretation of responses: 1.00 to 1.49 = *strongly disagree*; 1.50 to 2.49 = *disagree*; 2.50 to 3.49 = *neither agree nor disagree*; 3.50 to 4.49 = *agree*; and 4.50 to 5.00 = *agree strongly*. The internal reliability for this scale was  $\alpha = .80$ .

The third section of the instrument was designed to identify county commissioners’ preferred methods of being communicated to by their constituents. Respondents were asked to indicate their degree of preference for five methods of communication, including face-to-face, phone or conference call, email, written letter, and social media platforms. Respondents who indicated any degree of preference for being communicated to via social media were then asked to indicate their preference of select social media platforms (e.g. Facebook, Twitter). Responses were collected using a 5-point Likert-type scale: 1 = *not at all preferred*; 2 = *slightly preferred*; 3 = *moderately preferred*; 4 = *very preferred*; and 5 = *extremely preferred*. Real limits were set for the interpretation of responses. 1.00 to 1.49 = *not at all preferred*; 1.50 to 2.49 = *slightly preferred*; 2.50 to 3.49 = *moderately preferred*; 3.50 to 4.49 = *very preferred*; and 4.50 to 5.00 = *extremely preferred*.

### **Data Collection and Analysis**

Florida county commissioners’ emails were obtained from an online search. A modified approach to Dillman’s, Smyth’s, and Christian’s (2009) Tailored Design Method was used to collect responses from Florida county commissioners. The initial email to county commissioners included a description of the study, consent protocol, and a link to the online questionnaire. Follow-up reminder emails were sent once a week for three weeks to county commissioners who had not yet responded. Due to low response, a fourth and final reminder was distributed two weeks following the fourth email. Descriptive statistics, including means and standard deviations, were used for all objectives in this study.

### **Findings**

#### **Objective One: Impact of Factors on County Commissioners’ Decision-Making**

Objective one sought to determine the impact of various factors on Florida county commissioners’ decision-making regarding agricultural and natural resource (ANR) policy decisions. Of the factors provided, respondents identified communication from a farmer or rancher ( $M = 3.77$ ;  $SD = .954$ ) and scientific information from a university ( $M = 3.61$ ;  $SD = .878$ )

as those that would have a high impact on their decision-making about an ANR policy. Respondents identified communication from a president/director of an agricultural association ( $M = 3.41$ ;  $SD = .836$ ) and constituents other than agricultural organizations or farmers/ranchers ( $M = 2.92$ ;  $SD = .944$ ) as having only a moderate impact on their decision-making about an ANR policy.

### **Objective Two: How County Commissioners Prepare to Vote on ANR Policies**

Objective two was concerned with how Florida county commissioners prepare to vote on ANR policies. Respondents indicated strongest agreement with the statements “I would seek information from multiple sources” ( $M = 4.57$ ,  $SD = .536$ ; see Table 2), and “I would consider both the positive and negative implications that could result” ( $M = 4.54$ ,  $SD = .605$ ). Respondents indicated lower agreement with the statements “I would ask others for their opinions on the matter” ( $M = 4.17$ ,  $SD = .795$ ), and “I would discuss my opinions with others” ( $M = 4.09$ ,  $SD = .875$ ).

Table 2

*Florida county commissioners’ agreement with statements regarding how they prepare to vote on ANR policies (N = 54)*

Item	<i>M</i>	<i>SD</i>	Interpretation
I would seek information from multiple sources.	4.57	.536	Strongly agree
I would consider both the positive and negative implications that could result.	4.54	.605	Strongly agree
I would seek to fully understand the policy.	4.52	.574	Strongly agree
I would seek factual information.	4.50	.771	Strongly agree
I would ask others for their opinion on the matter.	4.17	.795	Agree
I would discuss my opinions with others.	4.09	.875	Agree

*Note:* Real Limits: 1.00 to 1.49 = *Strongly disagree*, 1.50 to 2.49 = *Disagree*, 2.50 to 3.49 = *Neither agree nor disagree*, 3.50 to 4.49 = *Agree*, 4.50 to 5.00 = *Strongly agree*

### **Objective Three: County Commissioners’ Preferred Methods of Communication**

Objective three was designed to examine how county commissioners preferred constituents communicate information to them. Face-to-face schedule meetings ( $M = 3.58$ ,  $SD = .949$ ) and email ( $M = 3.51$ ,  $SD = 1.012$ ) were the most preferred among respondents. Respondents only slightly preferred to be communicated to via social media ( $M = 2.02$ ,  $SD = 1.118$ ).

County commissioners who indicated some degree of preference (slightly, moderately, very, or extremely preferred) for being communicated to via social media were then asked to indicate their preferences for specific social media platforms. Respondents identified Facebook ( $M = 3.04$ ,  $SD = 1.290$ ) as the most preferred social media platform. Other social media platforms were preferred significantly less: Twitter ( $M = 1.68$ ,  $SD = 0.983$ ), Google+ ( $M = 1.67$ ,  $SD = 0.961$ ), LinkedIn ( $M = 1.48$ ,  $SD = 0.849$ ), YouTube ( $M = 1.44$ ,  $SD = 0.641$ ), Pinterest ( $M =$

1.26,  $SD = 0.594$ ), Instagram = ( $M = 1.26$ ,  $SD = 0.526$ ), Snapchat ( $M = 1.19$ ,  $SD = 0.526$ ), Tumblr ( $M = 1.15$ ,  $SD = 0.456$ ), and BuzzFeed ( $M = 1.12$ ,  $SD = 0.431$ ).

Table 3

*Florida county commissioners' preferences regarding how constituents communicate information to them (N = 54)*

Item	<i>M</i>	<i>SD</i>	Interpretation
Face-to-face scheduled meeting	3.58	.949	Very preferred
Email	3.51	1.012	Very preferred
Phone or conference call	3.11	.974	Moderately preferred
Written letter	2.98	1.000	Moderately preferred
Social media platforms	2.02	1.118	Slightly preferred
Other	2.00	1.414	Slightly preferred

*Note:* Real Limits: 1.00 to 1.49 = *Not at all preferred*, 1.50 to 2.49 = *Slightly preferred*, 2.50 to 3.49 = *Moderately preferred*, 3.50 to 4.49 = *Very preferred*, 4.50 to 5.00 = *Extremely preferred*

### **Conclusions, Implications, and Recommendationsf**

Communication with farmers and ranchers, along with scientific information from a university, had the highest impact on county commissioners' decision-making regarding ANR policy decisions. As such, to ensure favorable ANR policy decisions at the county level, farmers and ranchers should contact county commissioners directly to share their concerns, opinions, and knowledge regarding the policy or issue. This finding supports the use of farmers and ranchers as opinion leaders in facilitating change in ANR policy and regulations. Practitioners in the field should communicate these findings to the ANR members with whom they work in order to demonstrate to those individuals the impact they can have on LEOs decision-making about ANR policies. As county commissioners also identified scientific information as having a high impact on their decision-making about ANR policies, farmers and ranchers should reference scientific resources from the university when communicating ANR information to their local elected officials.

When preparing to vote on an ANR policy, county commissioners reported they would seek information from multiple sources, consider both positive and negative implications, seek to understand the policy fully, and seek factual information. This finding suggests Florida county commissioners employ considerable effort prior to voting on ANR policies. It should be cautioned, however, that bias in responses according to how county commissioners believed they should respond is a possibility. It is, therefore, recommended that further qualitative research be conducted with county commissioners to gain futher insight into how they vote on ANR policies. When examining the findings as reported by county commissioners in this study, constituents in the ANR sector should provide factual information from multiple sources when communicating information to their county commissioenrs. In addition, farmer and rancher consituents should

conveys to county commissioners how the proposed policy would negatively or positively impact them as a member of the ANR community. As previous literature has suggested LEOs are elected because of their ties and ability to represent a community's values (Berry et al., 1996), constituents should also make efforts to frame such information in the form of a community value.

When being communicated to by constituents, county commissioners most preferred face-to-face, scheduled meetings. Social media was the least preferred method of communication. Therefore, it is recommended that ANR community members seek to schedule face-to-face meetings with their county commissioners to impact effectively county-level ANR decisions. Constituents should avoid relying on social media discussions to convey information or views about ANR policies to county commissioners.

The sample population in this study was small, and the low response rate poses limitations regarding the ability to generalize the findings of this study. As such, it is recommended that this study be replicated with local elected officials in other states. Future research should also seek to explore best methods of gathering responses from elected officials to help move this line of research forward. This study did not examine the impact of other, specific constituent groups on county commissioners ANR policy decision-making. It could, therefore, be beneficial to examine the weight of the voice of farmers and ranchers compared to other types on constituents (e.g. business developers, land owners, local corporations). Future research should seek to examine the impact of such forms of communication, as well as the presence of other factors, in county commissioners decision-making about ANR policy decisions. Lastly, research similar to this study should be conducted with elected officials at the state and national levels.

### References

- Brownson, R., Royer, C., Ewing, R., & McBride, T. D. (2006). Researchers and policymakers: Travelers in parallel universes. *American Journal of Preventive Medicine*, 30(2), 164–172. doi:10.1016/j.amepre.2005.10.004.
- Cairney, P., & Kwitkowski, R. (2017). How to communicate effectively with policymakers: Combine insights from psychology and policy studies. *Palgrave Communications*, 3(37), 1–6. doi:10.1057/s41599-017-0046-8
- Catchings, G., Wigenbach, T., & Rutherford, C. (2005). Texas agricultural organization board members knowledge of and information sources for the 2002 Farm Bill. *Journal of Applied Communications*, 89(4) doi:10.4148/1051-0834.1314
- Daniels, T. (2018) The Napa County agricultural preserve: Fifty years as a foundation of America's premier wine region. *Journal of Planning History*, 153851321876904. doi:10.1177/1538513218769042
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method*. Hoboken, NJ: John Wiley & Sons, Inc.

- Ferris, K. O. (2010). The next big thing: local celebrity. *Society*, 47(5), 392-395. doi:10.1007/s12115-010-9349-8.
- Gregrich, R. J. (2003). A note to researchers: communicating science to policy makers and practitioners. *Journal of Substance Abuse Treatment*, 25(3), 233-237. doi:10.1016/s0740-5472(03)00120-x.
- Hanson, R. (1998) *Governing partners: State local relations in the United States*. Routledge Travis and Francis Group: New York, London.
- Jackson-Elmoore, C. (2005). Informing state policymakers: Opportunities for social workers. *Social Work*, 50(3), 251-261. doi:10.1093/sw/50.3.251.
- Johnson, D. M., & Shoulders, C. W. (2017). Power of statistical tests used to address nonresponse error in the Journal of Agricultural Education. *Journal of Agricultural Education*, 58(1), 300–312. doi:10.5032/jae.2017.01300
- Kam, C. D. (2005). Who toes the party line? Cues, values, and individual differences. *Political Behavior*, 27(2), 163-182. doi:10.1007/s11109-005-1764-y.
- Lindner, J. R., Murphy, T. H., Briers, G. G. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43–53. doi:10.5032/jae.2001.04043
- Lundy, L. K., Ruth, A., Telg, R., & Irani, T. (2006). It takes two: Public understanding of agricultural science and agricultural scientists' understanding of the public. *Journal of Applied Communications*, 90(1), 55–68. doi:10.4148/1051-0834.1290
- Miller, L. E., & Smith, K. L. (1983). Handling nonresponse issues. *Journal of Extension*, 21, 45–50. Retrieved from <https://joe.org/joe/1983september/83-5-a7.pdf>
- Mooney, C. Z. (1991). Peddling information in the state legislature: Closeness counts. *Western Political Quarterly*, 44, 433–444. doi:10.2307/448787.
- Oliver, K., Innvar, S., Lorenc, T., Woodman, J., & Thomas, J. (2014). A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC health services research*, 14(1), 2. doi.org/10.1186/1472-6963-14-2.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In *Communication and persuasion* (pp. 1-24). Springer, New York, NY.
- Shanley, P., & López, C. (2009). Out of the loop: why research rarely reaches policy makers and the public and what can be done. *Biotropica*, 41(5), 535-544. doi:10.1111/j.1744-7429.2009.00561.x.
- Stoker, G., & John, P. (2009). Design experiments: Engaging policy makers in the search for evidence about what works. *Political Studies*, 57(2), 356-373. doi:10.1111/j.1467-9248.2008.00756.x.

Treise, D., & Weigold, M. F. (2002). Advancing science communication: A survey of science communicators. *Science Communication*, 23(3), 310–322.  
doi:10.1177/107554700202300306.

Vogelsang-Coombs, V., & Miller, M. (1999) Developing the governance capacity of local elected officials. *Public Administration Review*. 59(3, )199–217. Retrieved from <https://www.jstor.org/stable/3109949>