SELF-EFFICACY OF EARLY-CAREER AGRICULTURAL SCIENCE TEACHERS IN TEXAS

A Thesis

by

BODIE RAY CARROLL

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Chair of Committee,	John Rayfield
Co-Chair of Committee,	Timothy Murphy
Committee Member,	Shawn Ramsey
Head of Department,	Jack Elliot

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ABSTRACT

The purpose of this study was to determine the self-efficacy of early-career agricultural science teachers from Texas, in the three domains of agricultural education, classroom instruction, FFA, and supervised agricultural experience (SAE). This descriptive study was conducted in the state of Texas using a random sample of 1st, 2nd, and 3rd year agricultural science teachers. A response rate of 50.6% was achieved (N=168, n=85). The respondents complete an online survey using the Qualtrics™ system. The survey included 49 likert scale items, as well as demographic items.

The results of this study show summated self-efficacy scores on a scale of 1 (No Capability) to 9 (A great deal of capability) of 6.14, 6.87, and 6.91 for the domains of classroom instruction, FFA, and SAE, respectively. Teachers in this study reported the lowest self-efficacy in the categories of utilize a program advisory board (M=5.29), manage a horticulture/greenhouse laboratory (M=5.64), and assist students in preparing FFA proficiency applications (M=5.69). In addition, teachers reported the highest self-efficacy in the categories of supervise students during FFA trips and activities (M=7.94) and assist students in planning FFA chapter activities (M=7.58). Lastly, this study sought to examine the relationship between demographic variables and self-efficacy in each of the three domains. A moderate correlation was found between six different variables.

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CHAPTER I

INTRODUCTION

Agricultural education, at the secondary level, faces a major shortage of teachers (Wolf, 2011). Kantrovich (2007) estimated a teacher deficit of 38.5% for 2007, which translated to only 69.8% of graduates entering the teaching profession. Hovatter (2002) found that 50% or more of qualified graduates were employed in a career field other than teaching. There is a national shortage of agricultural educators at the secondary level and it is estimated that there will be hundreds of unfilled positions this year (NAAE.org, About Ag Education). Croasmun, Hampton, & Hermann (1999) discovered teacher attrition to be the largest factor when determining the demand for teachers in the United States. According to Boone and Boone (2009), attrition is often linked to the number and type of problems teachers face and their success or failure could depend on their ability to address these problems.

The first goal of the National Strategic Plan and Action Agenda for Agricultural Education is, "An abundance of highly motivated, well-educated teachers in all disciplines, pre-kindergarten through adult, providing agriculture, food, fiber and natural resources systems education" (National Council for Agricultural Education, 2000, p.4). Wolf (2011) stated that a teacher must be competent in the tasks they are to perform. According to Bandura (1994), self-efficacy is an individual's belief that they can achieve or perform a task or skill. Teacher self-efficacy is connected to plans to stay in the profession of teaching (Darling-Hammond, Chung, & Frelow, 2002). Wolf (2011) cited

in order to retain teachers they must be competent in the tasks they are required to perform as agricultural educators. Wolf goes on to say that assessing an educator's self-efficacy in tasks specific to agricultural education, will inform teacher preparation programs about the areas in which additional professional development is required.

The researcher suspects this study will be one of the first to study self-efficacy of early-career agricultural science teachers in the three domains of agricultural education in Texas. Previous research has been done to investigate the self-efficacy of student teachers from Texas, primarily in the classroom instruction domain (Edgar, Roberts, & Murphy, 2009; Roberts, Harlin, & Briers, 2008; Stripling, Ricketts, Roberts, & Harlin, 2008; Roberts, Mowen, Edgar, Harlin, & Briers, 2007; Harlin, Roberts, Briers, Mowen, & Edgar, 2007; Roberts, Harlin, & Ricketts, 2006; Edgar, Roberts, & Murphy, 2011) Additionally, Burris, McLaughlin, McCullough, Brashears, & Fraze, (2010) conducted a study examining the differences in general efficacy among first and fifth year teachers. Roberts, Harlin, & Briers (2008) stated research in the area of self-efficacy has mostly been conducted by only a few researchers, in very few states. The need for this study arises from the lack of research dealing with self-efficacy of early-career agricultural science teachers in the state of Texas and the effect self-efficacy has on teacher attrition.

Purposes And Objectives

The research objectives of this study are as follows:

1. Determine the self-efficacy of early-career agricultural science teachers in the domains of classroom instruction, FFA, and supervised agricultural experience (SAE).

2. Determine if demographic characteristics of early-career agricultural science teachers are correlated with self-efficacy.

Assumptions

For this study, the following assumption are accepted as true and helped guide the study:

1. All respondents were certified agricultural science teachers in their first, second, and third year of teaching.
2. The respondents completed the survey in an honest manner.
3. The competencies included in the instrument align with the expectations that an agricultural science teacher is expected to perform.

Limitations

The limitations of this study include the ability to generalize results to all early-career teachers in Texas. Results should not be generalized to early-career teachers in other states because the competencies included on the instrument are based on skills teachers in Texas should be able to perform. It is likely that, these competencies are consistent to those of other states, but since this study was conducted only on Texas teachers it would not be appropriate to generalize these results to other states.

Operational Definitions

The following terms have been operationally defined for this study:

- Early-career agricultural science teacher- an individual who was in their first, second, and third year of teaching agriculture science during the 2012-2013 school year in the state of Texas.

- Supervised Agricultural Experience (SAE)- one of the three essential components of agricultural education, SAE projects offer project-based and experiential learning opportunities for students. SAE projects are typically supervised by the agricultural science teacher (National FFA Organization, 2012a).
- FFA- the intracurricular student leadership organization portion of agricultural education. The FFA emphasizes learning through experience, leadership, competition, and service by giving students opportunities to pursue their interests and talents in a variety of competitions, contests, and leadership growth activities (National FFA Organization, 2012b).
- Classroom instruction- one of the three components of agricultural education, classroom instruction is where students learn contextual ideas related to agriculture, leadership, and community development (National FFA Organization, 2012c). Classroom instruction can take place in a traditional classroom, science laboratory, agricultural mechanics laboratory, greenhouse, garden, and a variety of other settings.
- Vocational Agriculture Teachers Association of Texas (VATAT)- the VATAT is an organization in Texas that provides services and teacher development opportunities for agriculture science teachers. The VATAT is most well known for the weeklong professional development conference they put on in the summer for agriculture science teachers.

- Teacher attrition- teachers who leave the teaching profession altogether (Ingersoll, 2001).

CHAPTER II

LITERATURE REVIEW

Introduction

A thorough literature review was conducted to frame this study. An extensive literature review covering agricultural education, teacher attrition, and self-efficacy is covered in the following sections.

Agricultural Education

The foremost model for organizing instruction in agricultural education includes the relationships between three major concepts: classroom and laboratory instruction, supervised agricultural experience, and agricultural youth organization participation (Phipps & Osborne, 1988). Classroom and laboratory instruction are the activities that happen within the school (Croom, 2008).

Typically, classroom activities are designed by an agricultural science teacher and presented to students in forms such as lecture, demonstration, assessment, review, and guided and independent practice (Talbert, Vaughn, & Croom, 2006). Supervised agricultural experience is an independent program designed for students to learn outside of the agricultural education classroom, but at the same time they should reiterate the concepts being learned in the classroom (Croom, 2008). Croom goes on to state SAE is a program that involves the cooperation of the student, parents, agriculture teacher, and an employer in some instances.

FFA is an instructional tool that recaps and combines the things learned and accomplished through an SAE and in the agricultural education classroom (Croom, 2008). FFA encourages students to pursue leadership and career readiness by participating in a variety of events including: career development events, leadership development events, individual awards, scholarships, and leadership programs (Phipps & Osborne, 1988). Figure 1, found below, is a visual depiction developed by Croom (2008) to help understand the three components of the agricultural education.

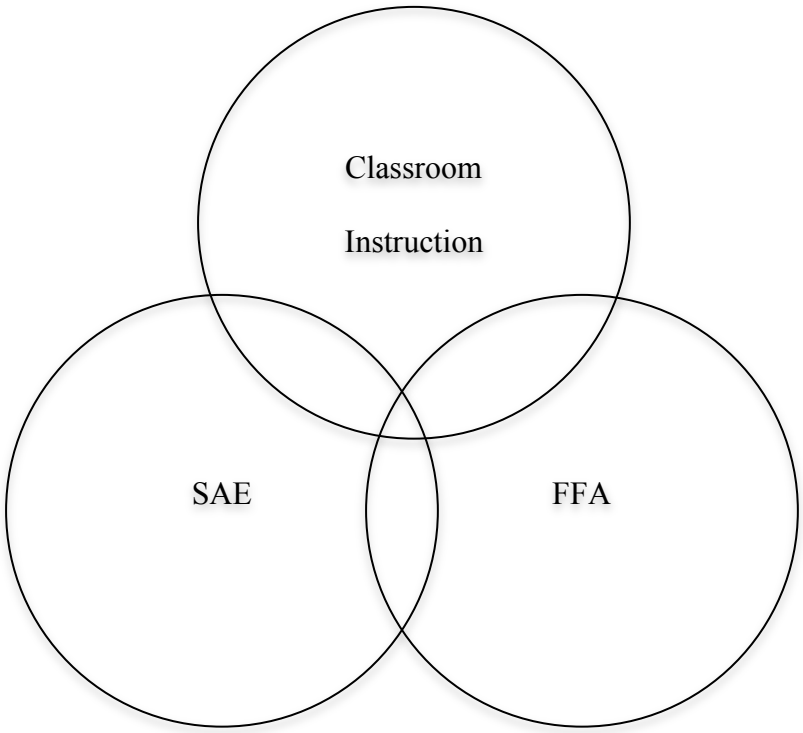

Figure 1: Agricultural Education Three Circle Model. (Croom, 2008)

According to the 2005-2006 Annual Report on Agricultural Education (Team AgEd, 2007), the 10x15 initiative set a goal of 10,000 high quality agricultural education programs by the year 2015. Wolf (2011) states this will create a demand of an additional 2000 agricultural education programs, which translates to a huge need for teachers to fill these programs.

Teacher Attrition

It is crucial to retain educators because student achievement is directly linked to teacher retention (Darling-Hammond, 2000). Each year, 15% to 33% of teachers change careers, which is higher than most other careers (Ingersoll, 2004; 2001). An estimated $2.2 billion is the loss each year from teacher attrition in the United States (Alliance for Excellent Education, 2005). Boone and Boone (2009) stated that a possible solution to address the nationwide teacher shortage is to study and reduce the level of teacher attrition.

Teachers leave the profession for a variety of reasons, Fulton, Yoon, and Lee (2005) stated that teachers leave due to personal reasons, a change in careers, retire, or move schools, which is sometimes considered a type of attrition. Another leading reason for leaving the teaching profession is salary (Ingersoll, 2001). Attrition is often linked to the number and type of problems that a teacher faces (Boone & Boone, 2009). Boone and Boone posit that a teacher's success or failure depends on their ability to overcome and solve these problems.

Having a teacher shortage is not a new phenomenon; in fact, Kantrovich (2007) stated there has been a teacher shortage in agricultural education for the past 40 years.

According to Kantrovich, only 69.8% of graduates enter the teaching profession. Swan, Wolf, and Cano (2011) suggested low retention rates create a significant problem for the profession and overcoming the teacher shortage will require the preparation of high-quality future teachers who believe they have the potential for success as an agricultural educator. Wolf (2011) stated the study of self-efficacy could be a potential solution to the current shortage of teachers.

Self-Efficacy

General Self-Efficacy

Bandura (1994) defines self-efficacy as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives." (p. 1). Furthermore, Bandura (1977) asserted perceived self-efficacy is an individual's belief in their ability to systematize and perform the sequence of actions needed to complete a task or achieve an outcome. Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) defined self-efficacy as "the teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (p. 223).

Individuals derive self-efficacy from four main sources: mastery experiences, psychological and emotional states, vicarious experiences, and social persuasion (Bandura, 1994). Bandura goes on to state mastery experience is the most successful way to cultivate a strong sense of self-efficacy. This is most easily understood by the rationale of successfully completing a task promotes self-efficacy, but failure at a task weakens a person's self-efficacy (Wolf, 2011). Swan, Wolf, and Cano (2011) cited

mastery experiences are considered to be the most effective of the four components of Bandura's self-efficacy theory. Bandura (1977) states physiological and emotional arousal is an important aspect of self-efficacy because it adds the component of an individual that shows how they deal with stressful situations, vulnerability, and anxiety. According to Swan, Wolf, and Cano (2011), vicarious experiences involve viewing others doing well at a task, which may cause the viewer to believe they could also do well at the task. Social persuasion happens when an individual is convinced or persuaded that they can complete a task successfully.

Self-efficacy makes a distinction in the way people think, feel, and act (Schwarzer & Hallum, 2008). In fact, Schwarzer and Hallum go on to state a low self-efficacy is associated with depression, anxiety, helplessness low self-esteem, and pessimistic thoughts. Bandura (1993) stated that a person's beliefs influence how they feel, think, behave, and motivate themselves. In addition, Bandura (1993) stated that self-efficacy aids people in succeeding at tasks. Furthermore, Bandura (1977) stated that a person's belief in their ability to achieve a task would lead to competent performance of that task.

Although individuals must possess knowledge and skills, Bandura stated those are not requirements for success. Blackburn and Robinson (2008) stated two people may have similar backgrounds and skills, but one may not succeed at the same or similar task due to a difference in self-efficacy. However, it is important to note that an individual's self-efficacy is not indicative of their performance on a task nor is their performance on

a task an indicator of their belief in their ability to accomplish that same task (Edgar, Roberts, & Murphy, 2009).

The guiding theoretical framework for this study is derived from Woolfolk Hoy & Hoy's (2009) model in Figure 2, which was derived from Bandura's self-efficacy theory.

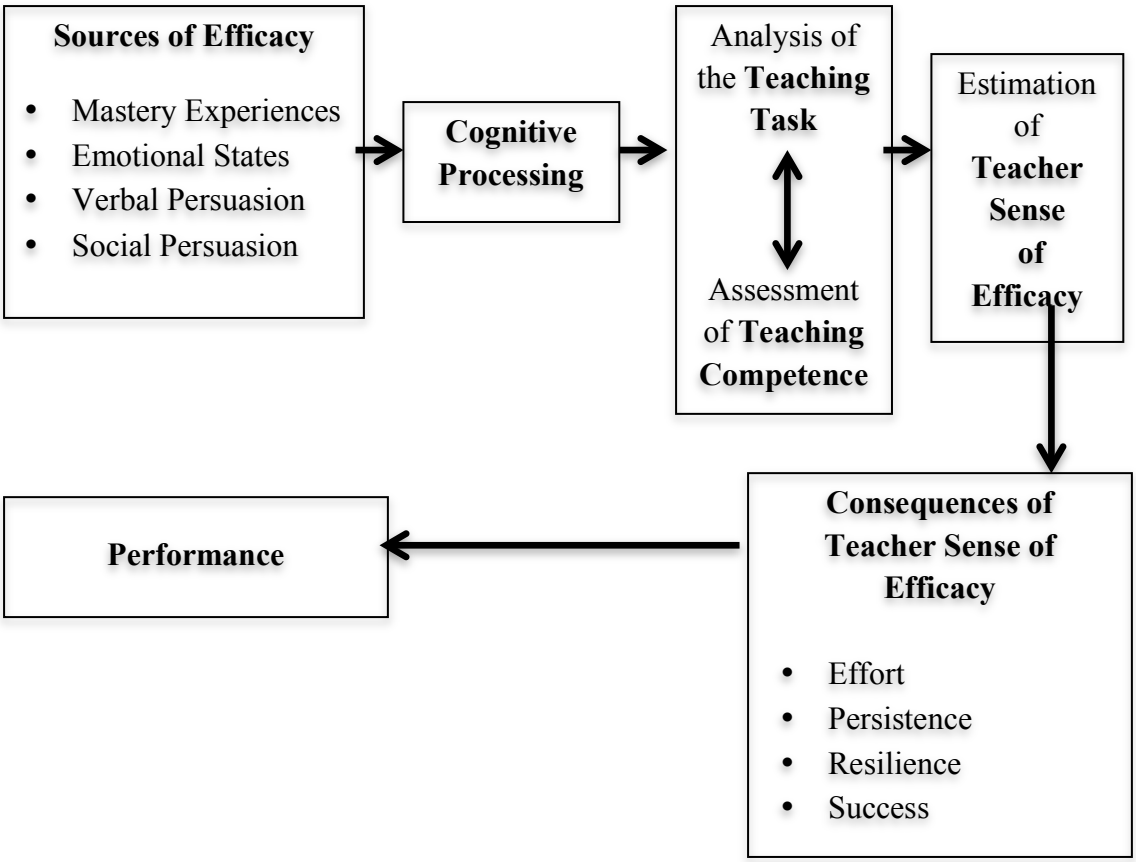

Figure 2: A model of teacher's perceived efficacy. (Woolfolk Hoy & Hoy, 2009)

Teacher Self-Efficacy

The framework for this study is embedded in the idea that a teacher must be self-effacious in order to perform and teach effectively. Teachers with a high sense of self-efficacy believe in their ability to overcome problems through time and effort, while teachers with low self-efficacy are typically overrun with classroom problems (Swan, Wolf, & Cano, 2011). Novice, or beginning teachers, who are more effacious, tend to stay in the teaching field because they have a stronger commitment to the field (Whittington, McConnell, & Knobloch, 2003). Previous research has shown that individuals who leave the teaching field are less effacious than those who choose to stay in the field (Glickman & Tamashiro, 1982).

A teacher's self-efficacy has been determined by previous research to be one of the most important variable that determines a teacher's effectiveness and performance in the classroom (Calik, Sezgin, Kavgaci, & Cagatay Killnic, 2012). Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) go on to state teacher efficacy has been found to have a relationship with a teacher's behavior, effort, enthusiasm, innovation, planning, perseverance, resilience, willingness to work with difficult students, and their commitment to the teaching profession. Additionally, Woolfolk Hoy and Davis (2006) stated that a teacher's sense of self-efficacy is closely related to student achievement.

Teachers with a high sense of self-efficacy have a belief they can reach students who are unmotivated through extra effort and help from parents or other teachers (Wolf, 2011). Additionally, a teacher with high self-efficacy is more open, willing, and likely to create dynamic student-centered learning environments (Wolf, 2011). Coldarci (1992)

found that efficacy is a significant predictor indicative of an individual's commitment to the profession. Additionally, Bruinsma and Jansen (2010) found that the quality of an individual's teacher preparation program is related to teacher commitment to the profession.

Agricultural Science Teacher Self-Efficacy

Teacher efficacy in the field of agricultural education is unique due to the additional competencies and skills required not typical to other fields of education (Harper, Weiser, & Armstrong, 1990). Phipps and Osborne (1988) stated agricultural education programs are unique and require leadership development and experiential learning, not typically found in other areas of education. According to Wolf (2011), teachers must believe they are competent in tasks they are required to perform as agricultural educators. To overcome the shortage of teachers the profession is facing, future teachers must be prepared and have a belief of success (Swan, Wolf, & Cano, 2011). This can help fight teacher attrition, and therefore keep a higher amount of teachers in the field (Swan, Wolf, & Cano, 2011). Bandura (1977) proposed that self-efficacy is most influential during the early part of learning, which is why this study aims to study the self-efficacy of early-career teachers. Although there has been research in the field of agricultural education, there has been no consensus of the data collected (Wolf, 2011). Wolf (2011) also stated that the literature base for self-efficacy of agricultural science teachers is not extensive.

Summary of Literature Review

Agricultural education begins with a workforce of highly qualified agricultural science teachers who have a high sense of self-efficacy. There is a national shortage of agricultural educators at the secondary level and it is estimated that there will be hundreds of unfilled positions this year (NAAE.org, About Ag Education). Teachers who have a higher sense of self-efficacy are more likely to stay in the teaching field and have a greater ability to perform their expected tasks (Swan, Wolf, and Cano, 2011). Several studies have examined the self-efficacy of early-career teachers, but few studies examine the self-efficacy of early-career teachers in the state of Texas in all three domains of agricultural education (classroom instruction, FFA, and SAE).

CHAPTER III

METHODOLOGY

Introduction

To accomplish the research objectives stated in Chapter I, the researcher followed a detailed plan and methodology. The population, sample, instrumentation, data collection, and data analysis are discussed in the sections below.

Design of Study

This study was descriptive in nature with a cross-sectional design. Fraenkel & Wallen (2009) explain that a descriptive study should attempt to fully explain a state of affairs fully and carefully. Gay, Mills, and Airasian (2012) describe a cross-sectional design as a method in which data is collected at a single point in time. The dependent variable for this study was teacher self-efficacy. The independent variables were the individual's ability to perform key tasks in the fields of FFA, SAE, and classroom instruction as well as demographic characteristics (gender, years of teaching Experience, number of teaching partners, community size, education, age, likeliness to teach until retirement, certification method, high school FFA involvement, highest FFA degree, and FFA membership). To address the research objectives for this study an online survey was utilized as the means of data collection.

Population and Sample

The population of interest for this study was all early-career agricultural science teachers in the state of Texas during the 2012-2013 school year. An early-career teacher

was defined as a teacher who was in their first, second, or third year of teaching during the respective school year. A list of all early-career teachers was obtained from the membership services department of the Vocational Agriculture Science Teachers Association of Texas (VATAT). Once the list was obtained, a simple random sample was taken from the population. In order to select a random sample, the population was entered in a spreadsheet alphabetically and then assigned a random number starting at one. Next, a table of random numbers was generated that ranged from one to 297 (the size of the population). The researcher determined a sample size of 168 participants was adequate for this study based on a confidence interval of 5 and a confidence level of 95%. A total of 85 respondents completed the survey resulting in a 50.6% response rate.

Instrumentation

The instrument for this study was acquired from Dr. Kaitlyn Wolf of the University of Idaho (Appendix A). The instrument was developed to study self-efficacy of agricultural science teachers across the country in the three domains of agricultural education: classroom instruction, SAE, and FFA (Wolf, 2011). Once the instrument was acquired it was edited and reviewed by a panel of experts in order to make the instrument Texas specific. This was done because in Texas some events fall into different categories on the state level than they would on a national level. A primary example of this is leadership development events (LDEs) and career development events (CDEs). Therefore, the panel of experts was assigned the task of making the instrument more specific to Texas agricultural science teachers. Overall, three items were amended on the instrument. Wolf (2011) reported reliabilities for the instrument ranging from .94

to .98 for the overall instrument. Reliability was analyzed and calculated post hoc for this study and a reliability score of .97 was calculated using Cronbach's Alpha. Wolf (2011) reported a panel of experts in the field of agricultural education determined the content validity of the instrument. There are no known threats to internal validity.

The instrument contained 49 likert scale items that allowed participants to rank their level of capability to complete a task on a scale of one (No capability) to nine (A great deal of capability). To account for non-response error the researcher used a comparison of early to late respondents (Linder, Murphy, Briers, 2001). An early respondent is defined as someone who responded by February 7th and a late respondent is anyone who responded after this point. No statistically significant differences were found between early and late responses, therefore, non-response error should not be considered a threat to internal validity. In addition to the 49-likert scale items, the researcher created 11 demographic questions to address the research objectives for this study. A panel of experts in agricultural education and instrument development then validated these questions.

Data Collection

Dillman, Smyth, and Christian's (2009) tailored design method was followed for the data collection procedures used during this study. The survey was uploaded to Qualtrics™ and all emails were sent and collected using the Qualtrics™ system. Qualtrics™ is an online survey system that allows researchers to create surveys, distribute them electronically, and collect/download data. Dillman, Smyth, and Christian

(2009) recommended using multiple contacts and to vary the message used in each email. There is no set number of contacts that are recommended.

For this study, the researcher used five points of contact, an initial email including the survey link, and four follow-up emails (Appendix B; Appendix C; Appendix D; Appendix E; Appendix F; Appendix G). Each email was sent out in one-week intervals over a five-week period. As recommended by Dillman, Smyth, and Christian (2009), the four follow up emails were varied and contained different information in order to maximize response rate. Dillman, Smyth, and Christian (2009) also recommended customizing emails by including a first or last name and to avoid sending bulk emails. Lastly, during the fourth and final follow-up email the researcher included a short message from the Vocational Agricultural Teachers Association of Texas (VATAT) director, Barney McClure, because Dillman, Smyth, and Christian (2009) mentioned sending an email or including a message from a powerful individual could help increase response rate.

Data Analysis

The data collected from this survey was analyzed using the Statistical Package for Social Sciences (SPSS). The data was exported directly from Qualtrics™ into a SPSS spreadsheet. Means and standard deviations were calculated for each of the likert-scale items to determine self-efficacy. Percentages and frequencies were calculated for the demographic questions. Pearson correlations were calculated to determine relationships between demographic items and likert-scale items.

CHAPTER IV

FINDINGS

Introduction

The purpose of this study was to assess the self-efficacy of early-career agricultural science teachers in the state of Texas. The findings of this study are reflected from the research objectives stated in Chapter 1. Descriptive statistics and correlations were calculated and used to report the findings of this studies objectives.

Demographic Data

Demographic data were collected for participants in the online Qualtrics™ survey. Frequencies and percentages are reported for number of years taught, gender, size of community, highest degree obtained, likeliness to teach until retirement, age, certification method, high school agriculture class experience, FFA membership, and highest FFA degree obtained.

The respondents were all in their first (*n*=32), second (*n*=36), or third (*n*=17) year of teaching. The majority of participants (*n*=58) reported their highest degree obtained as a Bachelor's degree. The size of the community in which the participants taught in was determined by categorizing each participant's school according to population density. These could be either rural, less than 2,500 people, suburban, between 2,500 and 50,000 people, or urban, more than 50,000 people, as identified by the U.S. Census Bureau (2011). The majority of teachers came from a suburban (*n*=39) or rural community (*n*=29). Additionally, data showed 29.4% (*n*=25) of respondents reported they were

undecided when asked how likely they were to teach until retirement. Additionally, 9.4% (*n*=8) and 7.1% (*n*=6) of participants said they were unlikely or very unlikely to teach until retirement, respectively. The majority of participants (82.4%; *n*=70) reported they were traditionally certified in agricultural science. Table 1, found below, provides a complete overview of demographic data.

Table 1

Teacher Demographics (N=85)

Demographic Variables	*f*	*%*
Years Taught		
1	32	37.6
2	36	42.4
3	17	20.0
Gender		
Male	45	52.9
Female	40	47.1
Number of Teachers in Program		
1	20	23.5
2	34	40.0
3	19	22.4
4	10	11.8
5 or more	2	2.4
Population of Community		
Less than 2,500	29	34.1
Between 2,501 and 50,000	39	45.9
Greater than 50,000	17	20.0
Highest Degree Obtained		
Trade/Technical Degree	1	1.2
Bachelor Degree	58	68.2
Some hours beyond Bachelor Degree	14	16.5
Master Degree	24	28.2
Some hour beyond Master Degree	3	3.5
Doctoral Degree	0	0

Table 1, Continued

Demographic Variables	*f*	%
Likeliness to Teach Until Retirement		
Very Unlikely	6	7.1
Unlikely	8	9.4
Undecided	25	29.4
Likely	26	30.6
Very Likely	20	23.5
Age		
20 or less	0	0
21-25	52	61.2
26-30	25	29.4
31-35	4	4.7
36-40	1	1.2
41 or higher	3	3.5
Teaching Certification Method		
Traditionally Certified in Agricultural Science	70	82.4
Traditionally Certified in Other Subject	0	0
Alternatively Certified	15	17.6
High School Experience		
Completed no agricultural science classes while in high school.	3	3.5
Completed 1 year or less of agricultural science classes while in high school.	3	3.5
Completed between 1 and 2 years of agricultural science classes while in high school.	1	1.2
Completed between 2 and 3 years of agricultural science classes while in high school.	6	7.1
Completed between 3 and 4 years of agricultural science classes while in high school.	72	84.7
FFA Member in High School		
Yes	80	94.1
No	5	5.9
Highest FFA Degree Obtained		
Discovery	0	0
Greenhand	2	2.4
Chapter	20	23.5
State	36	42.4
American	14	16.5
Not Applicable	13	15.3

Objective 1: Self-Efficacy of Early-Career Teachers

The purpose of research objective one was to assess the self-efficacy of early-career agricultural science teachers in the state of Texas in the domains of classroom instruction, FFA, and SAE. The results for research objective one were analyzed and reported in three sections (Classroom Instruction, FFA, and SAE). The data are reported in Tables 2, 3, and 4, using means and standard deviations. The instrument ranged from a score of one (No capability) to a score of nine (A Great Deal of Capability). Furthermore, mean scores ranging from 1.0-3.9 are considered low, scores between 4.0-6.9 are moderate, and scores between 7.0-9.0 are high.

Classroom Instruction Domain

The first part of research objective one sought to determine the self-efficacy of early-career teachers in the classroom instruction domain. There were no low mean scores (1.0-3.9), 14 items scoring (4.0-6.9), and 5 items scoring (7.0-9.0) in the classroom instruction domain. The two lowest means were, “Manage a horticulture laboratory/greenhouse,” and “Teach students with special needs.” Additionally, the two highest mean scores were, “Use computers in my teaching” and “Use multimedia in my teaching.”

Table 2

Self-Efficacy of Early-Career Teachers in the Classroom Instruction Domain (N=85)

What is your level of capability to:	*M*	*SD*
Utilize computers in my teaching	7.53	1.53
Utilize multimedia in my teaching	7.53	1.42
Respond to difficult questions from my students	7.27	1.13
Evaluate student learning	7.20	1.28
Motivate students to learn	7.12	1.17
Manage student behavior	6.99	1.44
Implement new curriculum into the agriculture program	6.95	1.26
Gauge student comprehension of what I have taught	6.94	1.23
Develop good questions for my students	6.91	1.22
Teach students to think critically	6.82	1.22
Effectively conduct field trips	6.82	1.90
Provide appropriate challenges for very capable students	6.80	1.40
Create lesson plans for instruction	6.65	1.92
Use a variety of assessment strategies	6.60	1.56
Manage an agricultural mechanics laboratory	6.56	2.14
Adjust my lessons to the proper level for individual students	6.49	1.44
Implement alternative strategies in my classroom	6.49	1.45
Teach students with special needs	6.48	1.80
Manage a horticulture laboratory/greenhouse	5.64	2.14

Note: 1= No Capability to 9= A Great Deal of Capability. Low= 1.0-3.9, Moderate= 4.0-6.9, High= 7.0-9.0.

FFA Domain

The second section of research objective 1 sought to determine the self-efficacy of early-career teachers in the FFA domain. There were no items that fell into the low range, seven in the moderate range, and nine in the high range. The two lowest mean scores were in the constructs of, “Assist students in preparing FFA proficiency applications” and “Utilize a program advisory board.” The two highest mean scores were in the competencies of, “Supervise students during FFA trips and activities” and “Assist students in planning FFA chapter activities.

Table 3

Self-Efficacy of Early-Career Teachers in the FFA Domain (N=85)

What is your level of capability to:	*M*	*SD*
Supervise students during FFA trips and activities	7.94	1.30
Assist students in planning FFA chapter activities	7.58	1.71
Assist students planning FFA banquets	7.48	1.73
Assist students in facilitating FFA fundraising activities	7.46	1.64
Recruit new FFA members	7.41	1.22
Prepare CDE teams	7.36	1.51
Assist students in recruiting new FFA members	7.25	1.37
Prepare LDE teams	7.08	1.90
Train a chapter officer team	7.01	2.04
Assist students in preparing for public speaking events	6.94	1.74
Assist students in preparing a Program of Activities	6.67	1.76
Assist students in developing an effective public relations program for the FFA chapter	6.61	1.85
Assist students in preparing FFA degree applications	6.16	2.06
Utilize the FFA Alumni	6.01	2.20
Assist students in preparing FFA proficiency applications	5.69	2.03
Utilize a Program Advisory Board	5.29	1.47

Note: 1= No Capability to 9= A Great Deal of Capability. Low= 1.0-3.9, Moderate= 4.0-6.9, High= 7.0-9.0.

SAE Domain

The third and final part of research objective one sought to determine the self-efficacy of early-career teachers in the SAE domain. There were no items that fell into the low range, seven in the moderate range, and six in the high range. The two lowest mean scores were in the items, “Supervise student placement SAE programs” and “Utilize the community to develop SAE opportunities for students.” The two highest mean scores were in the constructs of, “Conduct home/SAE visits” and “Utilize resources to make recommendations to students’ SAE projects.”

Table 4

Self-Efficacy of Early-Career Teachers in the SAE Domain (N=85)

What is your level of capability to:	*M*	*SD*
Conduct home/SAE visits	7.36	1.67
Utilize resources to make recommendations to students' SAE projects	7.26	1.43
Make recommendations for students' SAE projects	7.24	1.50
Show students the value of SAE programs	7.15	1.38
Provide career exploration opportunities for students	7.09	1.30
Supervise student entrepreneurship SAE programs	7.06	1.65
Develop SAE opportunities for students	6.93	1.65
Assist students in keeping SAE records	6.87	1.63
Assist students in receiving recognition for SAE projects	6.76	1.66
Motivate students to have an SAE program	6.73	1.71
Supervise student production SAE programs	6.66	1.81
Utilize the community to develop SAE opportunities for students	6.40	1.65
Supervise student placement SAE programs	6.35	1.67

Note: 1= No Capability to 9= A Great Deal of Capability. Low= 1.0-3.9, Moderate= 4.0-6.9, High= 7.0-9.0.

The mean scores and standard deviations for each domain were averaged to calculate grand means per construct and are included in Table 5. The highest summated mean score was a score of 6.91 in the SAE domain. The lowest mean score was 6.14 in the domain of classroom instruction.

Table 5

Summated Mean Scores of Teacher Self-Efficacy (N=85)

Domain	*M*	*SD*
SAE	6.91	1.59
FFA	6.87	1.72
Classroom Instruction	6.14	1.51

Note: 1= No Capability to 9= A Great Deal of Capability. Low= 1.0-3.9, Moderate= 4.0-6.9, High= 7.0-9.0.

Objective 2: Correlation Between Self-Efficacy and Demographics

The purpose of research objective two was to determine if there is a relationship between teacher self-efficacy in the three domains of agricultural education and demographic characteristics of early-career agricultural science teachers in the state of Texas. A Pearson product moment correlation was calculated to determine if there was a relationship between demographic characteristics and self-efficacy. Correlation scores ranging from .01 to .09 are considered negligible, .10 to .29 are considered low, .30 to .49 are considered moderate, .50 to .69 are considered substantial, and scores of .70 or higher are considered very high (Davis, 1971).

The highest correlation score was between the demographic characteristic, years of experience, and the domain of, FFA, with a r = .499, which according to Davis (1971) is a moderate correlation. There were five more correlation scores that fell into the moderate category. In order of highest to lowest correlation score, the five correlations were between likeliness to teach until retirement and SAE (r =. 404), likeliness to teach until retirement and FFA (r = -.370), number of teachers in program and SAE (r = -.361), highest FFA degree obtained and SAE (r = .341), and high school agriculture class experience and SAE (r = .308). The remaining correlation scores were either low or negligible. A summary of the highest six correlations, all of which are moderate correlations, can be found in Table 6. A negative correlation between likeliness to teach until retirement and FFA shows that the less likely an individual is to teach until retirement the higher their self-efficacy is within the FFA domain. In addition, the negative correlation between number of teachers in a program and the SAE domain

shows that the fewer teachers there are in a program the higher an individuals self-efficacy is in the SAE domain. Table 7, located below, provides an overview of the correlation scores.

Table 6

Summary of Highest Correlation Scores

Demographic Characteristic vs. Domain	Pearson Correlation (r)
Years of experience vs. FFA	.499
Likeliness to teach until retirement vs. SAE	.404
Likeliness to teach until retirement vs. FFA	-.370
Number of teachers in program vs. SAE	-.361
Highest FFA degree obtained vs. SAE	.341
High school agriculture class experience vs. SAE	.308

Note: .30 to .49 = Moderate

Table 7

Correlation between Demographic Characteristics and Self-Efficacy (N=85)

Demographic Characteristic	Classroom Domain	FFA Domain	SAE Domain
Years of Experience	-.170	.499	-.154
Number of Teachers in Program	-.078	.113	-.361
Population of Community	-.001	-.239	.264
Likeliness to teach until retirement	-.289	-.370	.404
Age	.101	.057	-.042
Teaching Certification	.227	-.149	-.123
High School Agriculture Class Experience	.239	-.268	.308
Highest FFA Degree Obtained	-.041	.082	.341

Note: .01 to .09 = Negligible, .10 to .29 = Low, .30 to .49 = Moderate, .50 to .69 = Substantial, .70 or Higher = Very Strong (Davis, 1971).

Summary

A study of 85 early-career agricultural science teachers from the state of Texas was conducted to evaluate their self-efficacy in the three domain of agricultural education. The findings of this study, including demographic data, self-efficacy in classroom instruction, FFA, and SAE, and correlation between self-efficacy and demographic characteristics, are reported using descriptive and correlation statistics.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Based on the results presented in Chapter IV, several conclusions, implications, and recommendations can be made about the self-efficacy of early-career agricultural science teachers from the state of Texas. The research objectives are further discussed and recommendations for further research are addressed.

Purpose and Objectives

The purpose of this study was to assess the self-efficacy of early-career teachers in the state of Texas. The following research objectives were created to carry out the purpose of this study:

1. Determine the self-efficacy of early-career agricultural science teachers in the domains of classroom instruction, FFA, and supervised agricultural experience (SAE).

2. Determine if demographic characteristics of early-career agricultural science teachers are correlated with self-efficacy.

Summary of Methodology

This study was descriptive in nature with a cross-sectional design. Fraenkel & Wallen (2009) explain that a descriptive study should attempt to fully explain a state of affairs fully and carefully. Gay, Mills, and Airasian (2012) describe a cross-sectional

design as a method in which data is collected at a single point in time. To address the research objectives for this study a survey was utilized as the means of data collection.

The population of interest for this study was all early-career agricultural science teachers in the state of Texas during the 2012-2013 school year. An early-career teacher is defined as a teacher who was in their first, second, or third year of teaching during the respective school year. A list of all early-career teachers was obtained from the membership services department of the Vocational Agriculture Science Teachers Association of Texas (VATAT). Once the list was obtained, a simple random sample was taken from the population. The researcher determined a sample size of 168 participants was adequate for this study based on a confidence interval of 5 and a confidence level of 95%. A total of 85 respondents completed the survey resulting in a 50.6% response rate.

The instrument was developed to study self-efficacy of agricultural science teachers across the country, in the three domains of agricultural education: classroom instruction, SAE, and FFA (Wolf, 2011). Once the instrument was acquired it was edited and reviewed by a panel of experts in order to make the instrument Texas specific. This was done because in Texas some events fall into different categories on the state level than they would on a national level. A primary example of this is leadership development events (LDEs) and career development events (CDEs). Therefore, the panel of experts was assigned the task of making the instrument more specific to Texas agriculture science teachers. Overall, three items were amended on the instrument. Wolf (2011) reported reliabilities for the instrument ranging from .94 to .98. Reliability was

analyzed and calculated post hoc for this study and a reliability score of .97 was calculated using Cronbach's Alpha. Wolf (2011) reported a panel of experts in the field of agricultural education determined the content validity of the instrument.

The instrument contains 49 likert scale items that allow participants to rank their level of capability to complete a task on a scale of one (No capability) to nine (A great deal of capability). To account for non-response error the researcher used a comparison of early to late respondents (Linder, Murphy, Briers, 2001). An early respondent is defined as someone who responded by February 7th and a late respondent is anyone who responded after this point. No statistically significant differences were found between early and late responses. In addition to the 49 likert scale items, the researcher created 11 demographic questions to address the research objectives for this study. A panel of experts then validated these questions. There was no need to check reliability of these questions due to the varying nature of demographic questions, such as age.

Dillman, Smyth, and Christian's (2009) tailored design method was followed for the data collection procedures used during this study. The survey was uploaded to Qualtrics™ and all emails were sent and collected using the Qualtrics™ system. Dillman, Smyth, and Christian (2009) recommended using multiple contacts and to vary the message used in each email. For this study, the researcher used five points of contact, an initial email including the survey link, and four follow-up emails. Each email was sent out in one-week intervals over a five-week period.

The data collected from this survey was analyzed using the Statistical Package for Social Sciences (SPSS). The data was exported directly from Qualtrics™ into a SPSS

spreadsheet. Means and standard deviations are reported for each of the likert-scale items to determine self-efficacy. Percentages and frequencies are reported for the demographic questions. Additionally, Pearson product moment correlations were calculated to determine if there is a correlation between demographic items and likert-scale items.

Summary of Findings

With this study, a snapshot of early-career agricultural science teacher self-efficacy in the state of Texas is provided. Although the results are not generalizable to all early-career teachers in the state, they provide an insight to the self-efficacy of early-career teachers, including potential strengths and weaknesses.

Demographic Data

According to the data, 42.4% of the respondents are second year teachers, 37.6% are first year teachers, and 20% are third year teachers. The breakdown of gender was pretty equal with males accounting for 52.9% of the sample and females 47.1% of the population. In what was once a male driven profession, females are quickly catching up to the number of males. Data also shows that 45.9% of the respondents teach in a suburban community (between 2,501 and 50,000 people) and 34.1% teach in a rural community (less than 2,500 people). The majority of the sample reported their highest degree obtained as a Bachelor's degree (n=58), however, 28.2% of the sample had completed a Master's degree.

About 54.1% (n=46) of the respondents reported they were likely or very likely to teach until retirement. Consequently, 29.4% of the respondents were undecided and

16.5% are unlikely or very unlikely to teach until retirement. In regards to age, 52 respondents reported being between 21 and 25, and 25 individuals reported being between 26 and 30. The majority of the sample was traditionally certified in agricultural science (n=70). Additionally, 72 respondents reported completing between 3 and 4 years of agricultural science courses while in high school and 80 individuals declared they were FFA members in high school. Lastly, 42.4% of the sample reported the highest degree they obtained in FFA was the state FFA degree.

An objective of this study was not to make conclusions or implications based on the demographic data, but to simply describe the population and to understand what demographic characteristics encompass the population of early-career agricultural science teachers in the state of Texas.

Objective 1: Self-Efficacy of Early-Career Teachers

Conclusions

As a result of this study, teachers, industry leaders, stakeholders, universities, teacher preparation programs, and various other members in the field of agricultural education can see a snapshot of the self-efficacy of early-career agricultural education teacher from across the state of Texas. In the classroom instruction domain, this sample of early-career agricultural science teachers reported having a summated mean self-efficacy score of 6.14. The classroom instruction domain had the lowest summated mean score of the three domains, although, each of the three domains fell into the high self-efficacy category with a score ranging from 6.1 to 9.

Respondents reported the lowest self-efficacy for the classroom domain on the skill of managing a horticulture laboratory/greenhouse. A mean score of 5.64 was reported. It can be concluded early-career teachers from this study have a low self-efficacy in this category. Consequently, early-career teachers may struggle to provide the appropriate guidance and instruction to students in this area of education. This is due to early-career teachers not having an adequate amount of skills or knowledge in the horticultural area. Additionally, early-career teachers in this study reported a low self-efficacy in regards to teaching students with special needs (M=6.48). As a result, early-career teachers might struggle to deliver and teach at a high level to students with special needs. This is most likely due to early-career teachers not receiving instruction in their teacher preparation program in regards to special needs students.

In the classroom instruction domain, there were two constructs that respondents scored very highly. A mean score of 7.53 was reported for both of the following variables, utilize computers in my teaching and utilize multimedia in my teaching. As a result, early-career agricultural science teachers should be able to provide a adequate education in this area due to their high self-efficacy. Additionally, technology integration and use of technology in the classroom should be a smooth, interactive, and positive experience for both teachers and students due to high teacher self-efficacy. This could result in students receiving higher quality instruction in this area of agricultural education, and it could ultimately lead to student successes.

In the FFA domain, teachers in this study reported a summated mean score of 6.87, which was the second highest mean score out of the three domains. Respondents

reported the lowest mean score in the construct of, utilize a program advisory board with a score 5.29. It is important to note this is the lowest mean self-efficacy score from all three domains. This sample of early-career agricultural science teachers may struggle to involve their local community, parents, past members, and businesses due to a low self-efficacy in this category. This may cause teachers to feel overwhelmed due to a lack of guidance from the community, which could ultimately lead to higher attrition rates. The data also shows teachers reported a low self-efficacy in the item of assisting students in preparing FFA proficiency applications. As a result, early-career agricultural science teachers could struggle to help students apply for and prepare proficiency applications. This means that teachers with a low self-efficacy in this area may struggle to assist students, which could lead to fewer students applying for proficiency awards. This could limit student opportunities within the FFA.

In the domain of FFA, early-career agricultural science teachers from the state of Texas reported a high self-efficacy in regards to the construct of supervising students during FFA trips and activities. A mean score of 7.94 was calculated for this construct, which was the highest mean self-efficacy score from all three domains. As a result, teachers from this study feel more comfortable supervising students on trips, which could lead to more students participating and traveling to FFA events. This could have a positive impact on FFA programs and students. Additionally, data shows a high mean score for the construct of assisting students in planning FFA chapter activities. Consequently, this could lead to better organized and more impactful opportunities for students in the FFA.

In the third and final domain of agricultural education, SAE, early-career agricultural science teachers reported a summated mean score of 6.91. This was the highest summated mean score from the three domains. Teachers reporting the highest self-efficacy in the SAE domain could result in greater SAE projects and opportunities for students. In the domain of SAE, the lowest reported self-efficacy was in the construct of supervising student placement SAE programs. A placement SAE is when a student is employed while gaining practical experience and developing skills needed to enter in a particular occupation or career (Talbert, Vaughn, & Croom, 2007). As a result of a low self-efficacy in this category, teachers could potentially steer students away from placement SAE programs or fail to recognize placement as a viable SAE project altogether. This could ultimately limit or hinder student occupational opportunities. Additionally, this could cause employers to look to other organizations or older individuals to fill their vacancies. The next lowest reported mean self-efficacy score in the SAE domain was in the category of utilize the community to develop SAE opportunities for students. Consequently, agricultural science teachers could lose opportunities from community members and businesses, which could greatly benefit students and their SAE projects.

In the SAE domain, data shows the highest mean score was in the category of conducting home/SAE visits with a mean score of 7.36. As a result, this may translate into a greater amount of guidance for students when receiving home visits for their SAE projects. The next highest mean score was in the competency of utilizing resources to make recommendations to students' SAE projects. Similarly to the previously mentioned

competency, possessing a high amount of self-efficacy in this domain could result in students receiving better guidance and instruction with their SAE projects. This is due to teachers using their resources to help guide students with their projects.

Overall, teachers possessed a moderate amount of self-efficacy in all three domains of agricultural education. This is good, but there is much room for improvement. There were very few competencies that received a high self-efficacy score. In order to retain early-career teachers, education from teacher preparation programs must be improved to give teachers a higher sense of self-efficacy. Improvement starts by analyzing the areas where teachers reported low self-efficacies and brainstorming potential solutions and possibilities for improved instruction. Once this is done, teacher preparation programs should begin to implement courses, units, and lessons that help teachers become more prepared for the areas reported with low self-efficacy.

Recommendations

Prior research (Wolf, 2011) shows that the study of self-efficacy could be a potential solution to the shortage of agricultural education teachers. This study sought to determine the self-efficacy of early-career agricultural education teachers in Texas. It can be concluded from this study most early-career agricultural education teachers have a moderate amount of self-efficacy in each of the three domains of agricultural education, classroom instruction, FFA, and SAE. These three categories had reported summated mean self-efficacy scores of 6.14, 6.87, and 6.91, respectively. It is important to note all three domains fall into the moderate range of self-efficacy. Continued

improvement in teacher education and professional development could lead to more competencies falling into the high range.

The researcher recommends a higher emphasis be placed on preparing teachers for the classroom instruction domain as data shows teachers were the least effacious in this domain. Specifically, data shows a high need for improving teacher self-efficacy in the area of managing a horticulture/greenhouse laboratory. Additionally, early-career teachers in the study reported a low self-efficacy in regards to teaching students with special needs. It is recommended teacher preparation programs place higher emphasis on preparing future teachers in these two competencies. Teachers can be better prepared for managing a horticulture/greenhouse laboratory by offering a college course or professional development workshop devoted to training and preparing agricultural science teachers for this area. In addition, teachers can be better prepared for teaching students with special needs by having time in their undergraduate dedicated to preparing them for teaching these types of students. Data also shows teachers have a high self-efficacy when it comes to using computers and multimedia in their teaching. In fact, it is likely early-career teachers are more prone to and better equipped to use computers and multimedia in their teaching than experienced teachers. As a result, spending large amounts of time educating teachers to use technology and multimedia could be considered a waste of time that could be better used educating them in other areas of need. In addition, it is recommended there be less professional development for technology applications.

In the FFA domain, a mean score of 5.29 was reported for the category of utilize a program advisory board. This was the lowest means score for the entire study. It is recommended teacher preparation programs and organizations such as the Texas FFA or VATAT further educate current and future teachers on this matter. Teachers are missing out on a very crucial opportunity and resource by not utilizing an advisory board to guide their chapter and its goals. Furthermore, in the FFA domain, teachers in this study reported a low self-efficacy (5.69) in regards to assisting students in preparing FFA proficiency applications. A possible solution is to increase education and professional development for teachers in this area. Additionally, it would most likely be useful for inexperienced teachers to partner and learn from teachers who are more experienced with proficiencies.

The SAE domain received the highest summated mean score of the three domains with a score of 6.91. Although this was the highest domain reported in this study, there were two competencies that received fairly low self-efficacy score. These two competencies were supervising student placement SAE programs and utilize the community to develop SAE resources for students. It is recommended continuing education and teacher preparation programs spend time developing teacher knowledge in these two areas. This is recommended because students can benefit greatly from SAE projects so it is important for teachers to have a high sense of self-efficacy in this area.

A very similar study of self-efficacy in the state of Ohio reported having summated mean self-efficacy scores of 7.15, 7.04, and 6.96 in the domains of classroom instruction, FFA, and SAE, respectively (Wolf, 2011). The mean self-efficacy scores for

this study were lower in all three domains of agricultural education. The lowest summated mean score in the study was in the classroom instruction domain, whereas, Wolf (2011) reported the classroom instruction domain was the highest. Classroom instruction should become a higher priority for early-career teachers and the organizations and universities responsible for educating prospective teachers in agricultural education. It is important for agricultural education teachers to be well rounded in all three domains. Therefore, it is important to increase the self-efficacy of early-career teachers in this domain.

Objective 2: Correlation Between Self-Efficacy and Demographics

Conclusions

The purpose of research objective two was to determine if there was a relationship between demographic variables and self-efficacy in each of the three domains of agricultural education. Correlations ranging from .01 to .09 are considered negligible, .10 to .29 are considered low, .30 to .49 are considered moderate, .50 to .69 are considered substantial, and scores of .70 or higher are considered very high (Davis, 1971). The highest six correlations were all considered to be moderate correlations.

The highest correlation was between the demographic variable, years of experience, and the FFA domain ($r = .499$). This shows that in this study the greater the years of experience the higher degree of self-efficacy a teacher possesses. As a result, early-career agricultural science teachers should become more successful and have greater results within the FFA domain the more experienced they become.

The next highest correlation (r = .404) is between the demographic variable, likeliness to teach until retirement, and the SAE domain. This shows that the more likely an early-career agricultural science teacher is to teach until retirement the higher their self-efficacy in the SAE domain. As a result, teachers who are more dedicated to staying in the profession will most likely be better equipped at providing SAE opportunities. Data shows a moderate negative correlation between likeliness to teach until retirement and self-efficacy in the FFA domain (r = -.370). This shows that the less likely a teacher is to teach until retirement the higher their self-efficacy is in the domain of FFA. As a result, the teachers in this study who are have a higher self-efficacy in the FFA domain are less likely to teach until retirement. A potential reason could be that teachers who are more successful in the FFA domain are putting in extra time and effort to be successful which causes them to have a higher self-efficacy, but consequently they are acquiring more duties that could make them want to leave the profession.

Data also shows a moderate negative correlation between the number of teachers in a program and the SAE domain. This means the smaller the program a teacher teaches in, the higher their self-efficacy in the SAE domain. This could be because teachers in smaller programs must work to help students with their SAE projects, which in turn increases their knowledge and ability, and ultimately it increases their self-efficacy. On the other hand, teachers in larger programs could rely on their teaching partners when it comes to SAE projects, or each teacher may be assigned to a different type of SAE project. This could possibly lead to teachers in larger programs felling less effacious in the SAE domain.

The fifth highest correlation was between the demographic variable, highest FFA degree obtained, and the SAE domain (r = .341). This means that for this study, the higher the FFA degree that an individual obtained, the greater their self-efficacy in the SAE domain. As a result, individuals in this study who worked harder to obtain higher degrees within the FFA are more likely to provide meaningful SAE opportunities for their students. This is most likely due to the fact that in order to receive higher FFA degrees, more complex SAE projects are required, thus making these individual more experienced in the SAE domain.

The next highest correlation was between the demographic variable, high school agriculture class experience, and the SAE domain (r = .308). This shows that for this study, the more agricultural science classes a respondent took in high school, the greater their self-efficacy in the SAE domain. As a result, individuals who had more high school agricultural class experience could produce greater opportunities and guidance for their students in the SAE domain. The remaining correlations were either low or negligible.

Recommendations

Data from this study concluded teachers have a higher degree of self-efficacy in the FFA domain as they gain more experience. It is recommended early-career teachers and prospective teachers be given more opportunities to be prepared for teaching in the FFA domain so they start out with a higher degree of self-efficacy. Additionally, data from this study shows the more likely a teacher is to teach until retirement the greater their self-efficacy in the SAE domain. It is recommended early-career teachers be better

prepared for this domain because some teachers could be choosing to leave the profession early due to their low self-efficacy in the SAE domain.

For this study, data shows the less likely an individual is to teach until retirement, the higher their self-efficacy in the FFA domain. A possible reason for this correlation is individuals who have a high self-efficacy in the FFA domain have acquired a larger time commitment in order to be successful in the FFA domain. It is recommended early-career teachers and prospective teachers be given professional development opportunities to help them manage their time and balance their efforts across the three domains of agricultural education. This could lead to teachers handling the demands of being a well-rounded agricultural science teacher and potentially staying in the profession longer.

Lastly, data shows three things in regards to the SAE domain. It shows the higher the FFA degree a member has obtained, the more agricultural class experience they had in high school, and the fewer teachers in their program, the higher their self-efficacy is in the SAE domain. It is recommended that teacher preparation programs try to recruit more students who have higher FFA degrees and more agricultural class experience due to their potential to help students in the SAE domain. In addition, it is recommended all teachers, regardless of program size or potential program size be educated and prepared for the demands of an SAE program. Furthermore, it is recommended students who have less agricultural class experience and students who didn't receive higher degrees in FFA be given ample opportunities in their undergraduate program to help them obtain a higher degree of self-efficacy in the SAE domain. This could be done by providing

students with opportunities inside and outside the classroom with high school student SAE projects and the duties associated with these projects.

Recommendations for Further Research

The results of this study provide researchers with several opportunities for further research within the area of agricultural science teacher self-efficacy. Not only should this study be replicated in other states to compare self-efficacy of agricultural science teachers across the nation, but also a follow up study should be conducted in Texas. A longitudinal study could help researchers understand more accurately the self-efficacy of early-career teachers and how it changes over time. A study comparing early-career and experienced agricultural science teachers could help illustrate changes in self-efficacy over time, as well as identify areas for professional development. Additionally, a need's assessment could help researchers and teacher preparation programs better understand and visualize areas for improvement within teacher preparation programs.

Wolf (2011) reported self-efficacy was highest in the classroom instruction domain for early-career agricultural science teachers in the state of Ohio. In this study, classroom instruction received the lowest summated mean self-efficacy score. Further research should be conducted to understand why the classroom instruction domain is lower and potential solutions to this problem. Additionally, Wolf (2011) reported higher summated self-efficacy scores in all three domain of agricultural education. Further research and investigation of self-efficacy in the state of Texas and across the nation could help researchers better understand this issue.

Only 54.1% of respondents in this study reported they are likely or very likely to teach until retirement. With a shortage of agricultural education teachers in the state and nation already, this should be of immediate concern to individuals related to the field of agricultural education. Further research should be done to examine what role self-efficacy plays in determining if an individual chooses to teach until retirement. Additionally, a need's assessment could help teacher preparation programs better understand needs and deficiencies within curriculum and instruction for professional development and education of prospective agricultural science teachers.

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APPENDIX A

INSTRUMENT

Self-Efficacy of Early-Career Agricultural Science Teachers

Q1 What is your level of Capability to:

	No Capability (1)	(2)	Very Little Capability (3)	(4)	Some Capability (5)	(6)	Quite a Bit of Capability (7)	(8)	A Great Deal of Capability (9)
Motivate students to learn	❍	❍	❍	❍	❍	❍	❍	❍	❍
Manage student behavior	❍	❍	❍	❍	❍	❍	❍	❍	❍
Teach students to think critically	❍	❍	❍	❍	❍	❍	❍	❍	❍
Create lesson plans for instruction	❍	❍	❍	❍	❍	❍	❍	❍	❍
Respond to difficult questions from my students	❍	❍	❍	❍	❍	❍	❍	❍	❍
Gauge student comprehension of what I have taught	❍	❍	❍	❍	❍	❍	❍	❍	❍
Develop good questions for my students	❍	❍	❍	❍	❍	❍	❍	❍	❍
Adjust my lessons to the proper level for individual students	❍	❍	❍	❍	❍	❍	❍	❍	❍
Use a variety of assessment strategies	❍	❍	❍	❍	❍	❍	❍	❍	❍
Implement	❍	❍	❍	❍	❍	❍	❍	❍	❍

alternative strategies in my classroom									
Provide appropriate challenges for very capable students	❍	❍	❍	❍	❍	❍	❍	❍	❍
Teach students with special needs	❍	❍	❍	❍	❍	❍	❍	❍	❍
Manage an agricultural mechanics laboratory	❍	❍	❍	❍	❍	❍	❍	❍	❍
Manage a horticulture laboratory/greenhouse	❍	❍	❍	❍	❍	❍	❍	❍	❍
Evaluate student learning	❍	❍	❍	❍	❍	❍	❍	❍	❍
Implement new curriculum into the agriculture program	❍	❍	❍	❍	❍	❍	❍	❍	❍
Utilize computers in my teaching	❍	❍	❍	❍	❍	❍	❍	❍	❍
Utilize multimedia in my teaching	❍	❍	❍	❍	❍	❍	❍	❍	❍
Effectively conduct field trips	❍	❍	❍	❍	❍	❍	❍	❍	❍
Advise FFA meetings	❍	❍	❍	❍	❍	❍	❍	❍	❍
Train a chapter officer team	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in planning FFA chapter activities	❍	❍	❍	❍	❍	❍	❍	❍	❍

Assist students planning FFA banquets	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in facilitating FFA fundraising activities	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in preparing FFA degree applications	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in preparing FFA proficiency applications	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in preparing a Program of Activities	❍	❍	❍	❍	❍	❍	❍	❍	❍
Prepare LDE teams	❍	❍	❍	❍	❍	❍	❍	❍	❍
Prepare CDE teams	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in preparing for public speaking events	❍	❍	❍	❍	❍	❍	❍	❍	❍
Utilize the FFA Alumni	❍	❍	❍	❍	❍	❍	❍	❍	❍
Utilize a Program Advisory Board	❍	❍	❍	❍	❍	❍	❍	❍	❍
Recruit new FFA members	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in recruiting new FFA members	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in	❍	❍	❍	❍	❍	❍	❍	❍	❍

developing an effective public relations program for the FFA chapter									
Supervise students during FFA trips and activities	❍	❍	❍	❍	❍	❍	❍	❍	❍
Provide career exploration opportunities for students	❍	❍	❍	❍	❍	❍	❍	❍	❍
Develop SAE opportunities for students	❍	❍	❍	❍	❍	❍	❍	❍	❍
Motivate students to have an SAE program	❍	❍	❍	❍	❍	❍	❍	❍	❍
Supervise student entrepreneurship SAE programs	❍	❍	❍	❍	❍	❍	❍	❍	❍
Supervise student placement SAE programs (41)	❍	❍	❍	❍	❍	❍	❍	❍	❍
Supervise student production SAE programs	❍	❍	❍	❍	❍	❍	❍	❍	❍
Conduct home/SAE visits	❍	❍	❍	❍	❍	❍	❍	❍	❍
Make recommendations for students' SAE projects	❍	❍	❍	❍	❍	❍	❍	❍	❍
Utilize resources to make recommendations to students' SAE	❍	❍	❍	❍	❍	❍	❍	❍	❍

projects									
Assist students in keeping SAE records	❍	❍	❍	❍	❍	❍	❍	❍	❍
Utilize the community to develop SAE opportunities for students	❍	❍	❍	❍	❍	❍	❍	❍	❍
Show students the value of SAE programs	❍	❍	❍	❍	❍	❍	❍	❍	❍
Assist students in receiving recognition for SAE projects	❍	❍	❍	❍	❍	❍	❍	❍	❍

Q2 How many years have you taught including the current year?

- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)

Q3 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Q4 How many teachers serve in your program?

- ❍ 1 Teacher (1)
- ❍ 2 Teachers (2)
- ❍ 3 Teachers (3)
- ❍ 4 Teachers (4)
- ❍ 5 or More Teachers (5)

Q5 What is the population of the community you teach in?

- ❍ Less than 2,500 people (1)
- ❍ Between 2,501 people and 50,000 people (2)
- ❍ Greater than 50,000 people (3)

Q6 What is the highest degree you have obtained? (Select all that apply)

- ❑ Technical or Trade degree (1)
- ❑ Bachelor Degree (2)
- ❑ Some hours beyond the Bachelor Degree (3)
- ❑ Master Degree (4)
- ❑ Some hours beyond the Master Degree (5)
- ❑ Doctoral Degree (6)

Q7 How likely are you to teach until retirement?

- ❍ Very Unlikely (1)
- ❍ Unlikely (2)
- ❍ Undecided (3)
- ❍ Likely (4)
- ❍ Very Likely (5)

Q8 What range captures your age in years?

- ❍ 20 or less (1)
- ❍ 21-25 (2)
- ❍ 26-30 (3)
- ❍ 31-35 (4)
- ❍ 36-40 (5)
- ❍ 41 or higher (6)

Q9 How did you receive your teaching certification?

- ❍ Traditionally Certified in Agriculture Science (1)
- ❍ Traditionally Certified in Other Subject (2)
- ❍ Alternatively Certified (3)

Q10 Please select the choice that best describes your high school experience.

- ❍ I completed no agriculture science courses while in high school (1)
- ❍ I completed 1 year or less of agriculture science courses while in high school (2)
- ❍ I completed between 1 and 2 years of agriculture science courses while in high school (3)
- ❍ I completed between 2 and 3 years of agriculture science courses while in high school (4)
- ❍ I completed between 3 and 4 years of agriculture science courses while in high school (5)

Q11 Were you a member of the FFA for at least one semester while in high school?

- ❍ Yes (1)
- ❍ No (2)

Q12 What was the highest FFA degree you obtained?

- ❍ Discovery (1)
- ❍ Greenhand (2)
- ❍ Chapter (3)
- ❍ State (4)
- ❍ American (5)
- ❍ Not Applicable (6)

APPENDIX B

INITIAL EMAIL

From: John Rayfield [jrayfield@tamu.edu]
Sent: Monday, January 14, 2013 6:00 AM
To: [First Name, Last Name]
Subject: Texas A&M Survey of Beginning Agriculture Science Teachers

January 14, 2013

Dear [First Name, Last Name]

We are writing to ask for your participation in a survey with the department of Agricultural Leadership, Education, and Communications at Texas A&M. We are asking beginning agriculture science teachers, like you, to reflect on your skills and abilities in the field of agricultural education.

Your responses to this survey are very important and will help in advancing teaching and research in agricultural science teacher preparation programs. As part of the survey, we are asking about your skills, abilities, and weaknesses in the arena of agricultural education.

This is a short survey and should take you no more than fifteen minutes to complete. Please click on the link below to go to the survey website and then begin.
Survey Link:

Your participation in this survey is entirely voluntary and all of your responses will be kept confidential. Once submitted, no personally identifiable information will be associated with your responses in any reports of this data. Should you have any further questions of comments, please feel free to contact me at jrayfield@tamu.edu or 979-862-3707.

We appreciate your time and consideration in completing the survey. Thank you for participating in the study! It is only through the help of teachers like you that we can provide information to help guide the direction of agricultural education programs in the state of Texas.

Many thanks,

Dr. John Rayfield
Assistant Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
979-862-3707
jrayfield@tamu.edu

Bodie Carroll
Graduate Student
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
817-917-2992
bodiecarroll@gmail.com

APPENDIX C

FOLLOW UP EMAIL 1

Follow Up Email #1
Subject: Texas A&M Survey of Beginning Agriculture Science Teachers

Dear [First Name],

We recently sent you an email asking you to respond to a brief survey about your skills and abilities as a beginning agriculture science teacher. Your responses to this survey are important and will help in advancing teaching and research in agricultural science teacher preparation programs.

This survey is short and should take you no more than 10 minutes to complete. We encourage you to take a few minutes to complete the survey.

Please follow the link below.

Survey Link:

Your response is important. Getting direct feedback from early-career teachers is crucial in improving the quality of education agriculture science teachers receive. Thank you for your help by completing the survey.

Sincerely,

Dr. John Rayfield
Assistant Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
979-862-3707
jrayfield@tamu.edu

Bodie Carroll
Graduate Student
Department of Agricultural Leadership, Education, and Communications
Texas A&M University

817-917-2992
bodiecarroll@gmail.com

APPENDIX D

FOLLOW UP EMAIL 2

${m://FirstName},

Spring is a busy time for agriculture science teachers, and we understand how valuable your spare time is during the semester. We are hoping you may be able to give about ten minutes of your time before stock shows and CDE's get too busy to help us collect important information for Texas A&M University and agricultural science teacher preparation programs across the state by completing a short survey.

If you have not yet responded, we would like to urge you to complete the survey. Please click on the link below to go to the survey.

Follow this link to the Survey: ${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

Thank you in advance for completing the survey. Your responses are important! Beginning teachers are the best source of information to help shape the educational experience of future agricultural science teachers.

Sincerely,

Dr. John Rayfield
Assistant Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
979-862-3707
jrayfield@tamu.edu

Bodie Carroll
Graduate Student
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
817-917-2992
bodiecarroll@gmail.com

APPENDIX E

FOLLOW UP EMAIL 3

${m://FirstName},

I know this is an extremely busy time of the year for agriculture science teachers and I realize how valuable your time is. We are hoping you may be able to give about ten minutes of your time to help us collect important information for Texas A&M University and agricultural science teacher preparation programs across the state by completing a short survey.

If you have not yet responded, we would like to urge you to complete the survey. Please click on the link below to go to the survey.

Follow this link to the Survey: ${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

Thank you in advance for completing the survey. Your responses are important! Beginning teachers are the best source of information to help shape the educational experience of future agriculture science teachers.

Sincerely,

Dr. John Rayfield
Assistant Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
979-862-3707
jrayfield@tamu.edu

Bodie Carroll
Graduate Student
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
817-917-2992
bodiecarroll@gmail.com

APPENDIX F

FOLLOW UP EMAIL 4

${m://FirstName},

Spring is a busy time for agriculture science teachers, and we understand how valuable your spare time is during the semester. We are hoping you may be able to give about ten minutes of your time before stock shows and CDE's get too busy to help us collect important information for Texas A&M University and agricultural science teacher preparation programs across the state by completing a short survey.

If you have not yet responded, we would like to urge you to complete the survey. Please click on the link below to go to the survey.

Follow this link to the Survey: ${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

Thank you in advance for completing the survey. Your responses are important! Beginning teachers are the best source of information to help shape the educational experience of future agricultural science teachers.

Sincerely,

Dr. John Rayfield
Assistant Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
979-862-3707
jrayfield@tamu.edu

Bodie Carroll
Graduate Student
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
817-917-2992
bodiecarroll@gmail.com

APPENDIX G

FINAL REMINDER EMAIL

${m://FirstName},

This is the final reminder for you to complete this survey assessing your ability as a beginning agriculture science teacher in the state of Texas. I know this is an extremely busy time for you and I would greatly appreciate your time and effort in completing this survey.

According to Barney McClure, Executive Director of the VATAT, ”Surveys like this help our profession meet the needs of a changing educational landscape. Sharing your experiences makes our profession stronger.” I hope you will take Mr. McClure's words to heart and take the time to help our profession.

This survey is very short and should take you no more than ten minutes to complete.

Follow this link to the Survey: ${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

Thanks again for your time and effort. I wish you the best of luck this school year and in the years to come. Please let me know if there is anything I can do to assist you.

Sincerely,

Dr. John Rayfield
Assistant Professor
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
979-862-3707
jrayfield@tamu.edu

Bodie Carroll
Graduate Student
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
817-917-2992
bodiecarroll@gmail.com

APPENDIX H

IRB APPROVAL LETTER

DIVISION OF RESEARCH

Office of Research Compliance and Biosafety

APPROVAL DATE: 01/24/2013

MEMORANDUM

TO:	John Rayfield ALRSRCH - Agrilife Research - Ag Leadership, Education & Communication
FROM:	Institutional Review Board
SUBJECT:	Initial Review Approval

Protocol Number:	IRB2012-0680
Title:	Agricultural Science Teacher Perceived Self–Efficacy: A Descriptive Study Of Beginning Agricultural Science Teachers in Texas
Review Type:	Expedited
Approval Period:	01/24/2013 **To** 01/15/2014
Review Categories and Regulatory Determinations:	Category 7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies

Provisions:

Comments: Waiver of documentation of consent approved.

This research project has been approved. As principal investigator, you assume the following responsibilities

1. **Completion Report:** Upon completion of the research project (including data analysis and final written papers), a Completion Report must be submitted to the IRB.
2. **Adverse Events:** Adverse events must be reported to the IRB immediately.
3. **Deviations:** Deviations from protocol must be reported to the IRB office immediately.
4. **Amendments:** Changes to the protocol must be requested by submitting an Amendment to the IRB for review. The Amendment must be approved by the IRB before being implemented.

This electronic document provides notification of the review results by the Institutional Review Board.

750 Agronomy Road, Suite 2701
1186 TAMU
College Station, TX 77843-1186

Tel. 979.458.1467 Fax. 979.862.3176
http://rcb.tamu.edu