Benchmarking Self-Efficacy of Early-Career Agricultural Science Teachers in Texas

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 using a random sample of first, second, and third year agricultural science teachers. A response rate of 50.6% was achieved (*N=*168,* n=*85). The respondents completed an online survey using the Qualtrics™ system. The survey included 49 likert scale items, as well as demographic items. Teachers in this study reported the lowest self-efficacy in the categories of utilize a program advisory board, manage a horticulture/greenhouse laboratory, and assist students in preparing FFA proficiency applications. Teachers reported the highest self-efficacy in the categories of supervise students during FFA trips and activities and assist students in planning FFA chapter activities. Additionally, this study examined the relationship between demographic variables and self-efficacy in each of the three domains.*

Introduction

Agricultural education at the secondary level faces a major shortage of teachers (Wolf, 2011). Foster, Lawver and Smith (2014) estimated a teacher deficit of 287 teachers for 2015. It is estimated that there will be hundreds of unfilled positions this year (Teach Ag, 2013). Hovatter (2002) found that 50% or more of qualified graduates were employed in a career field other than teaching. Croasmun, Hampton, and 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) cited that 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 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.

Previous research has been conducted 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, Murphy, & Roberts, 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, and 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. 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.

Literature Review/Theoretical Framework

Teachers leave the profession for a variety of reasons. Fulton, Yoon, and Lee (2005) stated teachers leave due to personal reasons, a change in career, 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. 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). 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. Wolf (2011) stated the study of self-efficacy could be a potential solution to the current shortage of teachers.

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 (1997) 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 that 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 individuals showing how they deal with stressful situations, vulnerability, and anxiety. According to Swan et al. (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 occurs 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 (1982) stated that a person's belief in their ability to achieve a task would lead to competent performance of that task. The guiding theoretical framework for this study is derived from Woolfolk Hoy & Hoy's (2009) model in Figure 1, which was derived from Bandura's (1994) self-efficacy theory.

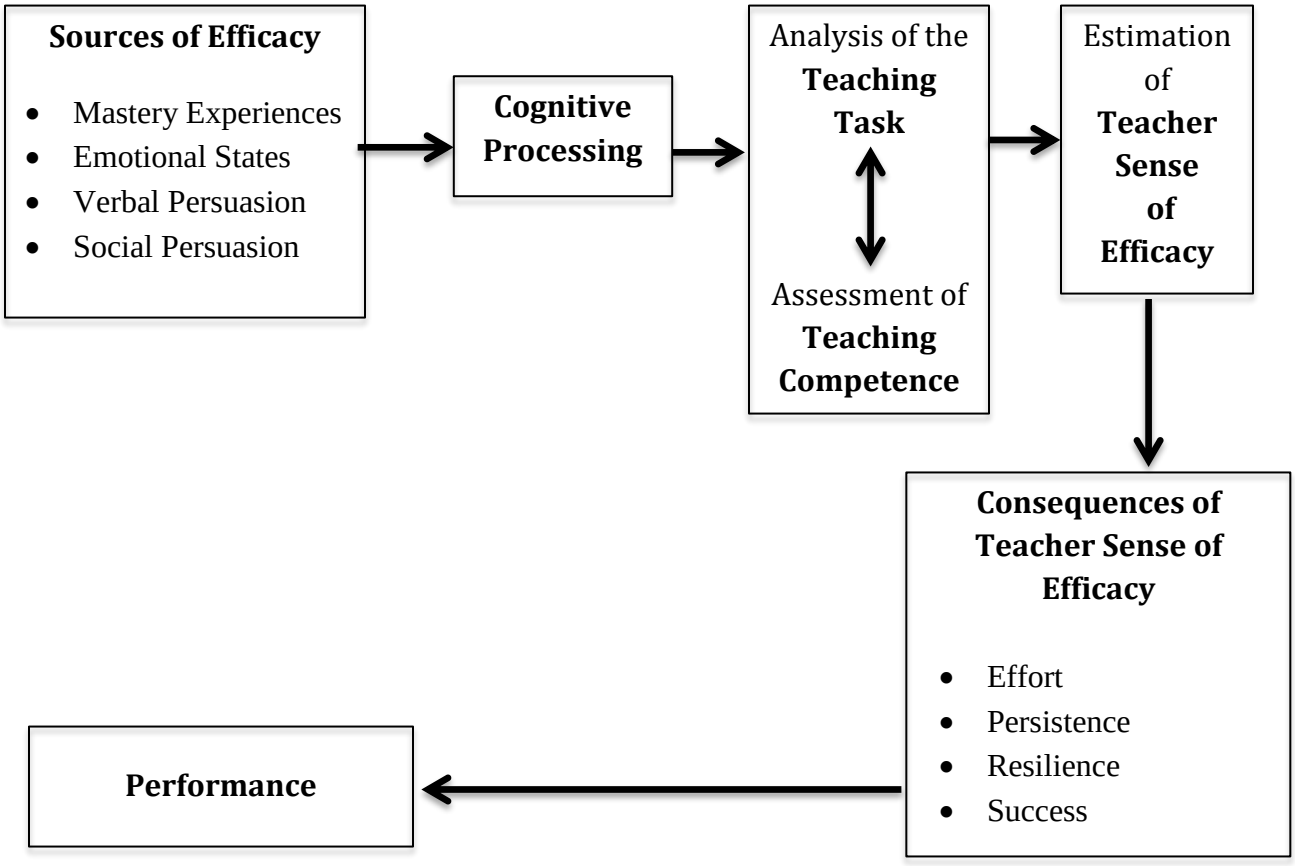

Figure 1: A model of teacher's perceived efficacy. (Woolfolk Hoy & Hoy, 2009)

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 variables that determines a teacher's effectiveness and performance in the classroom (Calik, Sezgin, Kavgaci, & Cagatay Killnic, 2012; Cooper, 2010; Mackenzie, 2000). 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.

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 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 the literature base for self-efficacy of agricultural science teachers is not extensive.

Agricultural education has always placed an emphasis on producing highly qualified teachers who have a high sense of self-efficacy. 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).

Methods

This study was descriptive in nature with a cross-sectional design. Fraenkel and 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.

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 (N = 302) was obtained from the membership services department of the Vocational Agriculture Science Teachers Association of Texas. 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 for this study was adapted from an instrument used 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, five 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 estimate 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 were 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.

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 et al. (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. As recommended by Dillman et al. (2009), the four follow up emails were varied and contained different information in order to maximize response rate.

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

Findings

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). Over 29% (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.

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 data are reported in Tables 1, 2, and 3 using means and standard deviations. The instrument ranged from a score of one (No capability) to a score of nine (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.

The first part of research objective one sought to determine the self-efficacy of early-career teachers 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 1

*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.

The second section of research objective one 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 2

*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.

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 3

*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 for each domain were averaged to calculate grand means per construct. The highest summated mean score was a score of 6.91 in the SAE domain. The next highest mean score was a score of 6.87 in the FFA domain and the lowest mean score was 6.14 in the classroom instruction domain.

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 an r = .49, 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 = .40), likeliness to teach until retirement and FFA (r = -.37), number of teachers in program and SAE (r = -.36), highest FFA degree obtained and SAE (r = .34), and high school agriculture class experience and SAE (r = .31). The remaining correlation scores were either low or negligible. A negative correlation between likeliness to teach until retirement and FFA indicated 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 indicated that the

fewer teachers there are in a program the higher an individual's self-efficacy is in the SAE domain. A summary of the findings are presented in Table 4.

Table 4

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

Demographic Characteristic	Classroom Domain	FFA Domain	SAE Domain
Years of Experience	-.17	.49	-.15
Number of Teachers in Program	-.07	.11	-.36
Population of Community	-.01	-.24	.26
Likeliness to teach until retirement	-.28	-.37	.40
Age	.10	.05	-.04
Teaching Certification	.22	-.15	-.12
High School Agriculture Class Experience	.24	-.26	.31
Highest FFA Degree Obtained	-.04	.08	.34

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, Conclusions, and Recommendations

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 fairly evenly distributed 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 suggests 45.9% of 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).

About 54.1% (n = 46) of the respondents reported they were likely or very likely to teach until retirement. Consequently, 29.4% of respondents were undecided and 16.5% are unlikely or very unlikely to teach until retirement. This finding requires further investigation. Are teachers burning out at a faster rate than in the past or are they simply finding other careers? 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 reported they were FFA members in high school.

In the classroom instruction domain, 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 moderate self-efficacy category with a score ranging from 4.0 to 6.9. Respondents reported the lowest self-efficacy for the classroom instruction domain on the skill of managing a horticulture laboratory/greenhouse (M = 5.64). Consequently, early-career teachers may struggle to provide the appropriate guidance and instruction to students in this area of education. Additionally, early-career teachers in this study reported moderate self-efficacy in regards to

teaching students with special needs (M = 6.48). We recommend higher emphasis be placed on preparing teachers for the classroom instruction domain as data indicated teachers were the least efficacious in this domain.

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 an 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 may 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. 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. Teachers are missing out on a crucial resource by not utilizing an advisory board to guide their chapter and its goals. The data also indicated teachers reported a low self-efficacy in the area of assisting students in preparing FFA proficiency applications. As a result, early-career agricultural science teachers may struggle to help students apply for and prepare 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 award applications.

In the domain of FFA, early-career agricultural science teachers 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 indicated 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. 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. Consequently, agricultural science teachers could lose opportunities from community members and businesses, which could greatly benefit students and their SAE

projects. We recommend continuing education and teacher preparation programs spend time developing teacher knowledge in these two areas.

Data indicated the highest mean score was in the category of conducting home/SAE visits with a mean score of 7.36. 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.

Prior research (Wolf, 2011) indicated that the study of self-efficacy could be a potential solution to the shortage of agricultural education teachers. 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. Continued improvement in teacher education and professional development could lead to more competencies falling into the high self-efficacy range.

A 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.

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 = .49). This indicated 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. 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.

The second highest correlation (r = .40) is between the demographic variable, likeliness to teach until retirement, and the SAE domain. This indicated 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. 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.

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.

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 conducted to examine what role self-efficacy plays in determining if an individual chooses to teach until retirement.

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