DECISION TO TEACH: A Q SORT WITH TEXAS A&M UNIVERSITY AGRICULTURAL SCIENCE STUDENTS

A Thesis

by

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ABSTRACT

The decision to teach agricultural science at the secondary level, specifically the influence of the student teaching experience on that decision, has been studied numerous times through a quantitative lens. Influential factors in that decision have been identified including: teacher efficacy, influence of the cooperating teacher, perceptions of barriers and support for preservice teachers, predicting student teachers' intention to teach, student teachers' changes in intention to teach, and even factors affecting agricultural students' decision to teach. However, the quantitative approach does not allow researchers to see the holistic view containing subjectivity of individuals' decisions. Ajzen's Theory of Planned Behavior was the framework for this study.

Q Methodology was used to identify the viewpoints of the decision to teach among Texas A&M University Agricultural Science pre-service teachers. Three viewpoints, "Mindful, Methodical Mentors," "Purposeful, Practical Planners," and "Collaborative, Cultural Cultivators" emerged as a result of factor analysis and were characterized. Qualitative data was used from the exit interviews following the Q sorts to determine that 12 of the 20 participants made the decision to teach agricultural science while they were in high school.

Recommendations include replications of this study at multiple universities and utilizing Q Methodology as a reflection activity for pre-service teachers following their student teaching experience.

DEDICATION

Dr. Murphy told me, a long time ago, that this thesis would outlive anything I could ever build with my two hands, so this work is dedicated to all my students. I hope that I have created something that you are proud of. I hope I have built something within you. I hope that you learned something in your time with me, whether that was in a formal classroom or not. I hope that you will always know how much Jesus and I love you.

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To all my students. Yes, I call you mine and I always will! Thank you for letting me be part of your learning experience here at Texas A&M University, and your life. I hope you have learned something from me and I want you to know you all have taught me more than you will ever realize! You are all my favorites and I wish you the best in whatever you choose to do!

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CONTRIBUTORS AND FUNDING SOURCES

Contributors

This work was supervised by a thesis committee consisting of Dr. Tim Murphy and Dr. Tobin Redwine of the Department of Agricultural Leadership, Education, and Communications and Dr. Joyce Juntune of the Department of Educational Psychology.

All other work conducted for this thesis was completed by the student independently.

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NOMENCLATURE

4-H	Global network of youth organizations whose mission is engaging youth to reach their fullest potential while advancing the field of youth development.
AGSC	Agricultural Science Program; Undergraduate Educator Preparation Program for agricultural science teachers at Texas A&M University.
Block	A cohort of student teachers at Texas A&M University.
Chapter	The local installment of the National FFA Organization; May be chartered in any public school with an agricultural education program.
CDE	Career Development Event; Event in which high school students compete based on their knowledge and skills in a particular subject.
FFA	National FFA Organization; A dynamic youth organization, specifically a career and technical student organization, based on middle and high school classes that promote and support agricultural education; Engagement Component of the Three Component Model.
Pre-service Teacher	A college student who is taking classes in preparation to be able to be a certified teacher.

SAE	Supervised Agricultural Experience; The real-world, hands on application of principles and concepts learned in the classroom and laboratory; Implementation Component of the Three Circle Model.
TAMU	Texas A&M University

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

Background

Being assigned to help prepare student teachers at Texas A&M University as a graduate assistant, I was placed in a position of trust to the point students would confidently tell me what was going on during student teaching, the unedited version that university supervisors or cooperating teachers probably did not get to hear. Now, I realize that not every single student that goes through any education program will want to pursue that vocation, but what if there are minor factors in this four year program that could be changed just enough to influence more than the current 70% (Kantrovich, 2007) of those students to decide to take a teaching job after graduation? I wanted to use that position of trust and confidence, and take the time to actually listen to the students in our program regarding a career of teaching.

Purpose of the Study

The purpose of this study was to develop an understanding of the beliefs and opinions Texas A&M University Agricultural Science students have about teaching as a career path. I intended to explore the impact of the components of the Agricultural Science Program on students' decision to teach as well as external motivators that have an influence on that decision. The purpose was achieved using the following research questions:

RQ1: What are the viewpoints of Texas A&M University Agricultural Science students about a career in teaching?

RQ2: What are the characteristics that make up each of these viewpoints?

RQ3: What do we know about the persons who identify with each viewpoint?

RQ4: When do students in the TAMU AGSC program decide to enter the field of agricultural education as a teacher?

Statement of the Problem

Many different aspects of agricultural education, and especially the student teaching experience, have been studied through a quantitative lens including: teacher efficacy (McKim & Velez, 2017; Roberts, Harlin, & Ricketts, 2006), influence of the cooperating teacher (Kasperbauer & Roberts, 2007), perceptions of barriers and support for preservice teachers (Rocca & Washburn, 2008), predicting student teachers' intention to teach (Roberts, Harlin, & Briers, 2009), student teachers' changes in intention to teach (Roberts, Greiman, Murphy, Rickets, & Harlin, 2009), and factors affecting agricultural students' decision to teach (Lawver, 2009). However, there is very little research about any of these topics from a more holistic perspective.

This pattern is consistent with the one that Dooley (2007) described as present in the *Journal of Agricultural Education* prior to 2007, in which agricultural education research was lacking qualitative research. This mirrored the pattern that was present in the social sciences as a whole prior to the 1960s (Bogdan & Biklen, 2007) in that, qualitative research took some time to catch on. This pattern was influenced by the researchers in the hard (experimental) sciences and agricultural education research did not fit that mold. Quantitative research was the closest that agricultural education could get to the hard sciences, there was a groove found in that, and it has been difficult to deviate from (Miller, 2006). Decision or intent to teach has been studied time and time again, producing a body of measurable information, unfortunately this approach does not allow the researchers to see a holistic view of what is happening (Dooley, 2007). As I have interacted with most of the upperclassmen in the Texas A&M University Agricultural Science program, I have heard students' reasoning for deciding to teach or not, however there was no documentation of this. Research was needed to tell the story of those students.

Significance of the Study

In 2002, Camp, Broyles, and Skelton found that only 59% of agricultural science graduates chose to enter the teaching field. In late 2007, Kantrovich found that number had increased some, but still only 70% of graduates had elected to enter teaching as a career. Between 2014 and 2015, membership in the National FFA Organization increased from 610,240 to 629,367 students, which added 92 FFA Chapters and set the record for membership in the organization (National FFA Organization, 2015a). With agricultural education programs continuing to grow at the local level and in numbers across the country, supplying qualified agricultural science teachers is of utmost importance.

CHAPTER II

LITERATURE REVIEW

History of Secondary Agricultural Education

Barrick (1989) put it best, "Those who have been involved in agriculture throughout their lives often have difficulty with the realization that agriculture, as a science that could and should be studied, did not exist prior to the 19th century" (p. 24). A few societies for the promotion of agriculture were starting to pop up in states such as South Carolina, Massachusetts, and Connecticut in the 18th Century, and the first was being organized in Philadelphia in 1785. As early as 1794, the Philadelphia Society for the Promotion of Agriculture agreed that agriculture should be promoted to youth and it was suggested that the school system could be used "to educate the farmer in his business" (Stimson & Lathrop, 1954, p. 3). However, published documents and beginnings of fairs or exhibitions where premiums would be given for farm products did not come about until the early 1800s (Stimson & Lathrop, 1954). Through these agricultural societies, fairs "became a potent agency for the dissemination of valuable information with regard to new crops, implements, stock, and improvement in agriculture generally" (Stimson & Lathrop, 1954, p. 3). George Washington foresaw our nation's need for the spread of agricultural knowledge, and his recommendation to create a national agricultural board finally came to fruition under the presidency of John Quincy Adams (Stimson & Lathrop, 1954).

In December of 1857, a member of the House of Representatives introduced a bill to the House that would establish one college in all states. When President Lincoln signed the bill in 1862, it was named the Morrill Act after the man who introduced it, Justin Morrill (Stimson & Lathrop, 1954). Before this bill, many colleges were devoted to the liberal arts, but now these land-grant colleges accepted a broader variety of students and placed emphasis on agricultural and mechanical arts (Phipps, Osborne, Dyer, & Ball, 2008). However, the desire and push for agricultural courses to be taught at the secondary level faded drastically as the opinion of many people was that a student could simply be taught those subjects at the land-grant college without any introduction at the high school level (Moore, 2017). In 1909, a meeting of The Association of Land Grant Colleges determined that courses in agriculture, forestry, and horticulture should be included in the regular curriculum at the secondary level. Prior to that point, it was normal for professors at the land-grant colleges to teach the new methods and developments in agriculture to the students who became secondary teachers. The high school teachers would then *attempt* to implement those methods in their secondary classes (Stimson & Lathrop, 1954). “This was the only way to promote the study of agriculture among country people who never get to college (Stimson & Lathrop, 1954, p. 6).

The passing of the Hatch Act in 1887 actually did more for secondary agricultural education than most people realized. In addition to establishing experiment stations, it spurred A. C. True, Director of the Office of Experiment Stations, and Dick Crosby, special assistant to the director, to advocate for the need for dissemination of agricultural education in public secondary schools. This caused agricultural education to flourish and in February of 1917, the Smith-Hughes Act was passed (Moore, 2017). This act appropriated funds that would pay for programs in public schools at the secondary level that emphasized the trades, homemaking, and agriculture. These monies were allocated to pay for agricultural education teachers and teacher educators (Phipps et al., 2008). Although the Smith-Hughes Act put agricultural education on the map, it was being taught, even at the secondary level, long before the passing of this legislation. According to Gary Moore (2017), there were 85,573 students being taught agriculture in every state at 4,390 secondary schools across the United States in the 1914-15 school year. He wrote that, “passage of the Smith-Hughes Act in 1917 could be regarded as more of an “AMEN” to the teaching of agriculture than the start of it” (Moore, 2017, p. 23). The Smith-Hughes Act made all these programs more vocational, decreased the variability between programs by putting forth more strict guidelines, and, of course, provided federal funds so that secondary agricultural education would be sustainable (Moore, 2017).

Agricultural Science Teachers at the High School Level

At this point, there were students interested in agricultural courses at the secondary level, and there was somewhat of a curriculum for them in order to be prepared to enter courses of the same nature at a land grant college. Unfortunately, there was a short supply of agricultural teachers at the secondary level. The Federal Board for Vocational Education, now called the Department of Education, saw the need for pre-service programs for teachers of vocational agriculture. Much of that responsibility landed in the laps of the land-grant colleges where a four year degree program was created for that sole purpose (Stimson & Lathrop, 1954).

Defining Agricultural Education

So often, the terms agricultural education and vocational agriculture are used synonymously as well as being mistakenly used to describe education about all things that agriculture encompasses. In 1989, agricultural education was defined as “the scientific study of the principles and methods of teaching and learning as they pertain to agriculture” (Barrick, 1989, p. 26). Teaching teachers how to teach agriculture courses. Vocational agriculture, on the other hand, was the content of the agricultural science classes that were taught in the high school classroom; content such as livestock production, plant and soil science, floral design, small animal management, agricultural mechanics, agribusiness, food technology and safety, and so many more. This is where the confusion often occurs; the older definition of vocational agriculture is now what is deemed agricultural education.

The National FFA Organization (2015b) currently states that "agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems." Additionally, The National Council for Agricultural Education defines agricultural education as "a systematic program of instruction available to students desiring to learn about the science, business, and technology of plant and animal production and/or about the environmental and natural resources systems" (The Council, 2012).

The Three Component Model, reprinted from with permission from The National FFA Organization (2015b), offers a visual representation of agricultural education, shown in Figure 1. The three components are inquiry-based classroom and laboratory instruction, implementation through Supervised Agricultural Experiences (SAE), and engagement through FFA (National FFA Organization, 2015b). In a high school setting, school-based agricultural education addresses the content taught in the subject areas of agriculture in 32 classes, ranging from oil and gas production to turf grass management. These courses are taught to students who take a variety of career paths, two of those being transitioning straight into work in the industry, or transitioning to higher education, often in agriculture. The system that The Association of Land Grant Colleges foresaw has finally come full circle.

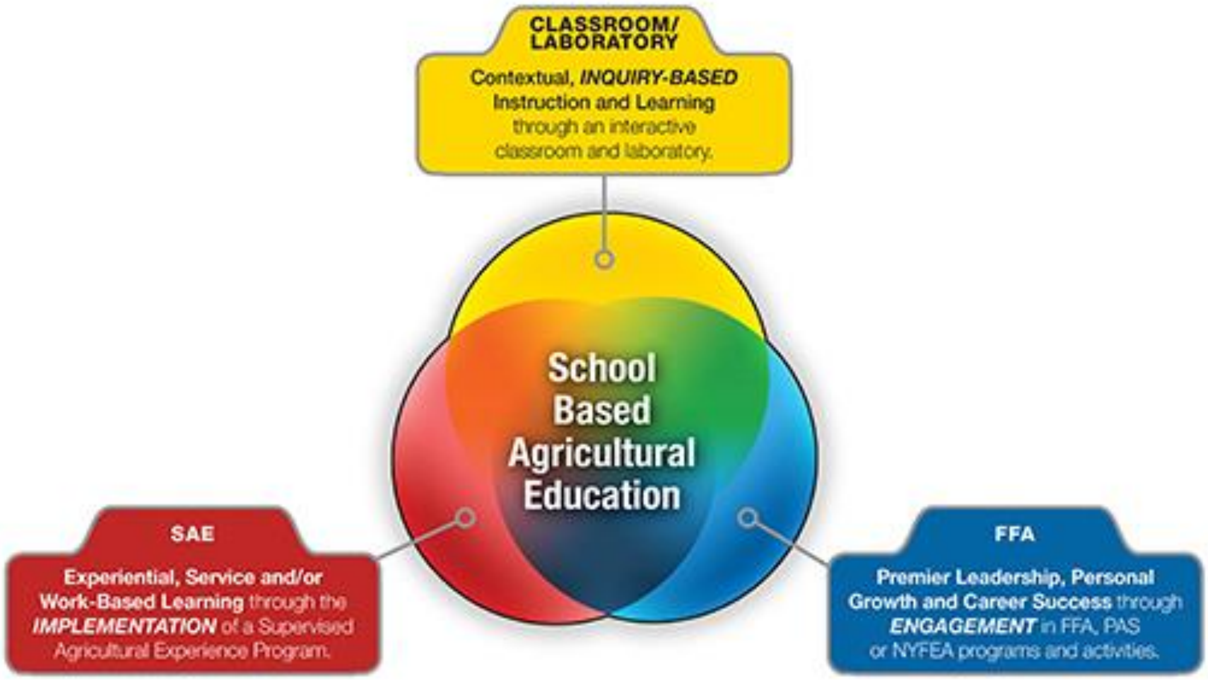

Figure 1: The Three Component Model of Agricultural Education (Reprinted from National FFA Organization, 2015b).

Shortage of Agricultural Science Teachers

To anyone who has spent any time in agricultural education, whether as a university faculty member, a high school teacher, or a college student, the facts that verify the teacher shortage in the United States will be well known, and may be the most disheartening part of this thesis to read. Unfortunately, these are the facts that have been stated before and will be restated long after this particular project is over, unless a radical change is made in education.

In 2000, "high school students spent more than 1.5 billion hours in vocational courses of one kind or another (Bishop & Mane, 2004, p. 381)" and in the 26 hours required for the average high school student, 4.2 of those hours were career and technical education classes, which included agricultural education (Bishop & Mane, 2004). Between 2014 and 2015, membership in the National FFA Organization increased from 610,240 to 629,367, setting a new record for student membership in the organization. In addition to involving more students, more chapters have been added, increasing from 7,665 to 7,757 FFA Chapters in a single year (National FFA Organization, 2015a). Agricultural education is growing!

In the 2016 Agriculture Teacher Supply and Demand Overview, Texas and New Mexico are included in the chart labeled Region 2 (Smith, Lawver, & Foster, 2017). Careful examination of the parts of the infographic labeled “Left Teaching,” and “Agricultural Education Graduates Teaching” indicates that in 2016, there were 209 teachers that left the teaching profession in Region 2, and 196 recent graduates that had chosen to enter the field of teaching agricultural science (Smith, Lawver, & Foster, 2017). This means that the agricultural science teaching profession in Region 2 was at a deficit of 13 teachers; not including any new programs, new positions created, or teachers that retired from a career of teaching agricultural science. The main point is that there were 66 programs nationwide that were left vacant with no hope of finding a teacher qualified in agricultural science (Smith, Lawver, & Foster, 2017).

With a little over 7,700 high school agricultural science programs in the nation, 66 may not seem like much of an issue. But in reality, if each teacher would hypothetically teach at least 15 students per class for six periods per day, he or she would be interacting with approximately 90 students per day. If each of those 66 programs educated 90 students daily, that would be 5,490 students that missed out on an agricultural science class in the United States. This is a major problem as the number of students in agricultural education is growing, and the supply of qualified agricultural science teachers is not increasing at the same rate.

What Does an Educator Preparation Program Look Like?

In 1995, there were about 84 active agricultural teacher education programs in the United States, with only 79 of those programs graduating certified agricultural science teachers (McLean & Camp, 2000). McLean and Camp (2000) did a study with 10 of those institutions to identify the content and courses that were being taught at the time as a response to the ongoing push for reform of agricultural teacher preparation. McLean and Camp (2000) found that of most of the institutions studied, courses in an agricultural education introduction, philosophies of agricultural education, methods of teaching, program planning, and student teaching were a commonality. Other classes that did not show up consistently across the 10 institutions included agricultural mechanics, use of technology in agricultural education, teaching in laboratory settings, curriculum development and assessment, FFA advisement, and Supervised Agricultural Experience (SAE). Results of that study led to the recommendation that all agricultural teacher preparation programs should include the following content: "Experiential Components of Agricultural Education, Foundations of Agricultural Education, Program and Curriculum Planning in Agricultural Education, Teaching Methods for Agricultural Education, and Teaching Technology in Agricultural Education" (McLean & Camp, 2000).

Existing Practices

Currently, at Texas A&M University, there are six courses housed within the Agricultural Science undergraduate degree program that are required prior to student teaching: Introduction to Agricultural Science Teaching, Clinical Professional Experience in Agricultural Science, Managing Safety in the Agricultural Science Program, Teaching Agricultural Mechanics, Designing Instruction for Secondary Agricultural Science Programs, and Facilitating Complete Secondary Agricultural Science Programs (incorporating FFA and SAE). This coursework, coupled with other general education requirements are completed before the second semester of the student's senior year. This is when students are assigned to a specific high school and cooperating teacher for a semester of supervised student teaching. This clinical experience comprises the last four courses of the Agricultural Science program at Texas A&M University.

McKim and Velez (2017) described student teaching as "an important crucible which includes components that support, and detract from, the development of teacher self-efficacy" (p. 174). According to Merriam-Webster, a crucible is a severe test, in that concentrated forces interact to cause or influence change or development. Baptism by fire is what I would call it; being required to take bits and pieces of the last three years of college classes, and trying to keep myself and my students alive on a daily basis with the help of Kalynn Baldock, my own cooperating teacher. When looking at three teacher development experiences: preservice coursework, student teaching, and professional development, McKim and Velez (2017) found that the 295 students most often marked the student teaching experience as the most impactful. So how is student teaching impactful?

Roberts, Harlin, and Ricketts (2006) looked at the impacts that student teaching has on teaching efficacy and broke it into four parts: student engagement, instructional strategies, classroom management and overall efficacy. Goddard, Hoy, and Hoy (2000) pointed out that the level of teaching efficacy is dependent on the setting, the students, the circumstances, and the subject they are teaching about. After surveying 33 student teachers at multiple points during the 11 week student teaching experience, Roberts, Harlin, and Ricketts (2006) found that teaching efficacy in all three fragments as well as teaching efficacy as a whole had increased after block, decreased halfway through student teaching, and then increased again after the conclusion of the student teaching experience. Researchers agree that continued professional development can also further the development of teacher efficacy (Ulmer, Velez, Lambert, Thompson, Burris, & Witt, 2013), but how can those students participate in further professional development if they decide not to teach?

Having a cooperating teacher is what makes the student teaching experience possible. Cooperating teachers are put in a unique situation in that they volunteer to help a fellow adult make the transition from student teacher to just teacher. Koerner (1992) stated that the relationship involved both treating the student teacher as a peer, as well as being the supervisor, instructor, and critic of the student teacher. As important as this role of cooperating teacher is, and as influential as student teachers claim that they are, Kasperbauer and Roberts (2007) found that "the student teaching/cooperating teacher relationship is not predictive of the decision to teach" (p. 16).

Rocca and Washburn (2008) looked at student teachers' barriers and support for entering the teaching field. Their data found that "gender discrimination was only perceived to be a slightly likely barrier" (Rocca & Washburn, 2008, p. 46). Gender discrimination was a touch higher for females, but not as big of a barrier as the literature had previously found. So why do undergraduate agricultural science students choose to enter the field of teaching?

Framework

The framework that served as a foundation for this study was Ajzen's Theory of Planned Behavior (Ajzen, 1991). The Theory of Planned Behavior is centered around an "individual's intention to perform a given behavior" (Ajzen, 1991, p. 181). This study examined the intention enter the profession of teaching agricultural science at the secondary level. The intention encompasses the attitude towards the behavior, the subjective norms, and perceived behavioral control that are all "motivational factors that influence a behavior" (Ajzen, 1991, p. 181).

Attitude is the outlook on the possibility of a future as an agricultural science teacher. Subjective norms are an individual's perceptions of how important people view and either approve or disapprove of their choice to become an agricultural science teacher. Perceived behavioral control is the perception of how difficult the task will be and if individuals have access to the resources and opportunities that will aid in the task being less difficult. Attitude, subjective norms, and perceived behavioral control feed off each other and then directly into intention. Intention then feeds directly into the behavior; this is the decision to take a job teaching agricultural science. Ajzen (1991) notes that generally, "the stronger the intention to engage in the behavior" (p. 181), the more likely it will come to fruition as long as that decision is made of the individual's free will. A diagram of the framework for the Theory of Planned Behavior that is associated with the decision to teach is presented in Figure 2.

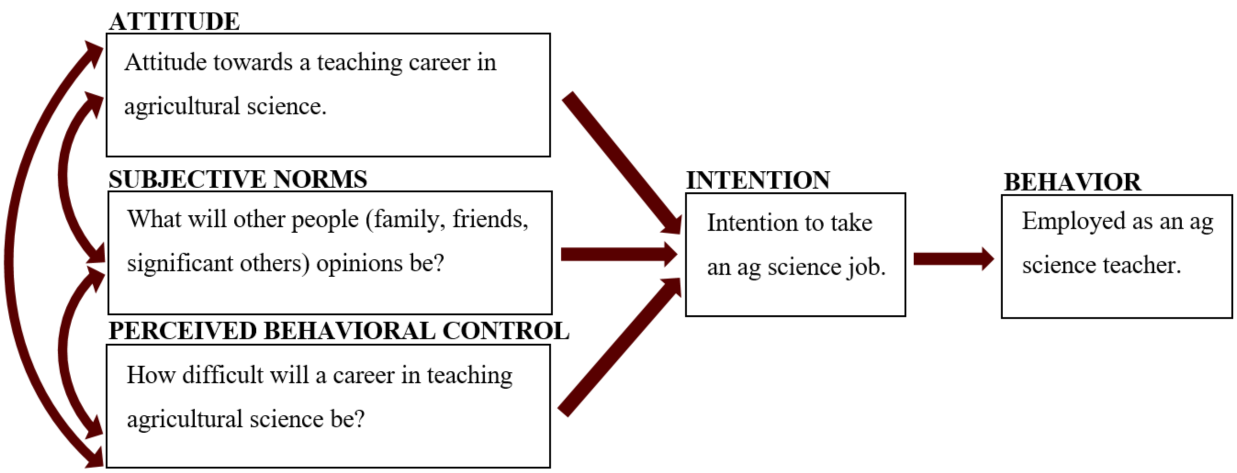

Figure 2: Theory of Planned Behavior as it pertains to the decision to teach agricultural science.

CHAPTER III

PURPOSE, OBJECTIVES, AND METHODS

The purpose of this study was to develop an understanding of the beliefs and opinions Texas A&M University Agricultural Science students have about teaching as a career path. I intended to explore the impact of the components of the Agricultural Science Program on students' decision to teach as well as external motivators that have an influence on that decision.

RQ1: What are the viewpoints of Texas A&M University Agricultural Science students about a career in teaching?

RQ2: What are the characteristics that make up each of these viewpoints?

RQ3: What do we know about the persons who identify with each viewpoint?

RQ4: When do students in the TAMU AGSC program decide to enter the field of agricultural education as a teacher?

To accomplish research questions one, two, and three, Q methodology was used. In order to accomplish research question four, a single question was asked at the conclusion of each Q sort and exit interview. This question was "Can you pinpoint a time and place when you decided you, for sure, wanted to teach?"

Research Design

This study utilized Q Methodology, which is an "adaptation of Charles Spearman's method of factor analysis" (Watts & Stenner, 2012, p. 21). In contrast to traditional R methodologies, Q Methodology "uses people to measure tests or statements" (Leggette & Redwine, 2016, p. 58). It allows researchers to peer deeply into the experiences of the individual "without sacrificing the power of statistical analysis" (Stephen, 1985, p. 193). Brown (1993) stated that “Q methodology provides a foundation for the systematic study of subjectivity” (p. 93), as the participants are sorting opinion statements from their point of view.

After experiencing a student teaching semester myself and assisting with four sets of student teaching blocks, a study of the human subjectivity in this situation is appropriate to investigate the students who choose to be in an agricultural science teacher preparation program for four or more years and then elect to enter the community of agricultural educators. Although much quantitative research has been done on the decision of preservice teachers to enter the field of teaching, specifically during the student teaching semester, there have not been any holistic studies asking those students what impacted their decision to teach. It is necessary to broaden the repertoire of research approaches to enhance and deepen the research being conducted in agricultural education and related contexts (Leggette & Redwine, 2016). This was the reason I chose to use Q Methodology as the research design for this study.

As for an ontology, or how the world is viewed by the researcher, a post positivist approach was used. Mottier (2005) posited “Whereas positivist research aims to offer ‘objective’ accounts of reality, post-positivist perspectives recognize the flawed nature of all methods, and therefore the impossibility of ever fully achieving this aim” (p. 3). In regards to epistemology, or the relationship between the researcher and research participants, there are three major stances: positivist, interpretive, and critical. The interpretive stance “views the researcher and research participants as co-creators in the knowledge building process” (Hesse-Biber, 2017, p. 28) and was the view used for this study.

This approach of Q Methodology “factors people across measures, or items” (Homeyer, 2016, p. 23) through a combination of quantitative data through a forced-choice instrument (sorting of statements) and qualitative data through interviews. The four steps of Q Methodology are (a) creating a concourse, (b) developing a Q-set, (c) identifying and creating a P-set, and (d) administering a Q sort (van Exel & de Graaf, 2005).

Concourse

The concourse in Q Methodology embodies all of the current knowledge, beliefs, opinions, and perceptions that exist about a particular subject (Brown, 1993). Watts and Stenner (2012) state that the concourse "is no more or less than the overall population of statements from which the final Q-set is sampled" (p. 34). In this study, the concourse was created by utilizing the literature to create a list of reasons individuals consider when making the decision to teach, identified by previous research. Using the snowball approach, I began with a few articles (Roberts, Greiman, Murphy, Rickets, & Harlin, 2009; Roberts, Harlin, & Briers, 2009; and Kasperbauer & Roberts, 2007) and a dissertation (Lawver, 2009) that contained some of those explicit reasons and dove backwards into the literature to find what those sources had listed as reasons that contributed to the decision to teach. I continued to compile this list of reasons until the reasons began to repeat themselves and the concourse had been saturated. Publications in the field of agricultural education, mainly the Journal of Agricultural Education, were the main source of these reasons; however, other educational publications were found as I continued to delve into the literature. These were also included as reasons in the concourse. The list of articles that were included in the concourse are in the order they were found and are listed in Table 1.

Table 1.

Articles included in creation of concourse

Date	Title of the Article	Authors
2009	Changes in Student Teachers' Intention to Teach During Student Teaching	Roberts, Greiman, Murphy, Ricketts, & Harlin
2001	Selected Variables Related to Expected Longevity in Teaching of Entry-Phase Agriculture Teachers	Edwards & Briers
2007	Influence of the Relationship Between the Student Teacher and Cooperating Teacher on Student Teacher's Decision to Enter Teaching	Kasperbauer & Roberts
2009	Predicting Agricultural Education Student Teachers' Intention to Enter Teaching	Roberts, Harlin, & Briers
2005	Preservice Teachers' Motivation and Leadership Behaviors Related to Career Choice	Harms & Knobloch
2005	A Description of the Characteristics Attributed to Students' Decision to Teach Agriscience	Park & Rudd
2005	Factors Influencing Career Choices Of Urban Agricultural Education Students	Esters & Bowen
2009	Factors Influencing Agricultural Education Students' Choice to Teach	Lawver
2015	Factors Contributing to Attrition as Reported by Leavers of Secondary Agriculture Programs	Lemons, Brashears, Burris, Meyers, & Price
1983	Agricultural Education Graduates' Attitudes toward Teaching Vocational Agriculture in South Carolina	Todd
2008	Preservice Agriculture Teachers' Perceptions of Career Barriers and Support	Rocca & Washburn
2002	"Why Teach? A Case Study Investigating the Decision to Train to Teach Information and Communication Technology (ICT)	Hammond*
2006	It Has Always Been My Dream': Exploring Pre-service Teachers' Motivations for Choosing to Teach	Manuel & Hughes*
1977	Schoolteacher: A Sociological Study	Lortie*
1981	Teacher Careers and Career Perceptions in the Secondary Comprehensive School	Lyons*
1997	Why Did Secondary PGCE Students Choose Teaching as a Career?	Reid & Caudwell*
2000	Undergraduates' Views of Teaching as a Career Choice	Kyriacou & Coulthard*
2006	Who Chooses Teaching and Why? Profiling Characteristics and Motivations Across Three Australian Universities	Richardson & Watt*

Note. *Articles not from the Journal Agricultural Education.

Q-set

Watts and Stenner (2012) stated there is no “correct way to generate a Q set” (p. 57) and it “is more an art than a science” (p. 58). However, the Q-set should be “broadly representative” (p. 58) of the concourse and selected so each statement carries the same amount of weight (Watts & Stenner, 2012). When looking at the Q-set as a whole, “each individual item makes its own original contribution” (p. 58) leaving no overlaps or gaps in the Q-set. “A Q-set must not make them [the participant] feel limited, restricted, or frustrated by failures of balance and coverage” (Watts & Stenner, 2012, p. 58).

There are two existing procedures for creating a Q-set: emergent and imposed. In the emergent procedure used in this study, the statements from the concourse are compared to each other similar to the constant comparative method that is used in qualitative research, so that larger themes or subsets emerge from the concourse (van Exel & de Graaf, 2005). For this study, each reason was printed on a slip of paper and those slips of paper were sorted using the constant comparative method. There were 31 themes that emerged as a result of this process and are listed in Table 2.

Table 2.

31 Themes that emerged from concourse

Theme
Gender
Impact on Students/Positive Role Model
Influence of Family and Friends
Job Opportunities
Service to Society
Allows for a Family Life
Working with Adolescents
Good Program Practices
Sharing a Passion for Agriculture
High School Agricultural Education
FFA
SAE
Enjoy Continual Learning
Enjoy/Good at Teaching
Student Teaching
Agricultural Work Experience
4-H
Age
Coaching/Competition
Former Ag Teacher Influence
University Faculty
Cooperating Teacher Influence
Fallback Career
Race/Ethnicity
Professional Status
Location
University*
Didn't Know or Care*
Power*
Negative Practices/Attitudes*
Help My Own Child*

Note. *Themes not used in developing Q-set.

Eight of the themes, *Gender, Professional Status, FFA, 4-H, Age, Coaching/Competition, SAE, Race/Ethnicity*, and *Location* contained four or fewer reasons, but could not be combined with any other themes and I deemed them viable to stand alone. As mentioned, there were some articles that were not found in the Journal of Agricultural Education. The themes *Power* and *Help My Own Child* only contained reasons from outside the agricultural education field and were left out of the themes for developing the Q-set. The theme *University* was a reason that was found in an article that engaged students from three different universities, but did not apply to this study as all participants were from Texas A&M University and was left out. The themes *Didn't Know or Care* and *Negative Practices/Attitudes* were deemed as reasons preservice teachers would decide not to teach and were not included in the themes for the Q-set.

After settling on the remaining 26 themes, I created two statements that represented the theme as a whole. *Sharing a Passion for Agriculture* was the theme that did not follow this rule as I believed it was better represented with three statements instead of two. The two statements for this theme were centered on changing students' misconceptions of agriculture and sharing a passion for agriculture. Then a novel reason was found, "Knowing that students had a knowledge of agriculture regardless of the profession they pursued" that I felt should be a statement in the Q-set, but still fit under the theme *Sharing a Passion for Agriculture.* The statements together are "broadly representative" of the entire concourse (Watts & Stenner, 2012). The list of statements that make up the Q-set are shown in Table 3 under their respective themes:

Table 3.

Q-set statements.

Theme	No.	Statement
Gender	1	My gender.
	2	The role of my gender in agricultural education.
Impact on Students/Positive Role Model	3	My desire to make a difference in the lives of students I teach.
	4	Serving as a positive role model for students.
Influence of Family and Friends	5	My family thinks I should become an ag teacher.
	6	My friends think I should become an ag teacher.
Job Opportunities	7	Ag teachers are well paid.
	8	Teaching ag will be a secure career.
Service to Society	9	Teaching ag allows me to provide a service to society.
	10	I am helping influence the next generation.
Allows for a Family Life	11	Teaching ag allows time for family.
	12	The hours of a teacher fit well with family responsibilities.
Working with Adolescents	13	I enjoy working with young people.
	14	I cherish spending time with students.
Good Program Practices	15	I want to develop a well-rounded program that involves classroom instruction, FFA, and SAE.
	16	My desire to grow a program for students and not just a class.
Sharing a Passion for Agriculture	17	I have a desire to share my passion for agriculture.
	18	My desire for my students to have a knowledge of agriculture, regardless of their career pursuits.
	19	I want to change the misconceptions about agriculture.
High School Agricultural Education	20	My previous high school agricultural education.
	21	The involvement I had in agriculture classes when I was in high school.
FFA	22	My previous FFA experiences.
	23	My own involvement in FFA when I was in high school.
SAE	24	My participation in SAE in high school.
	25	The involvement I had with my SAE project in high school.

Table 3. Continued.

Theme	No.	Statement
Enjoy Continual Learning	26	I really love always learning something new.
	27	I have had positive learning experiences.
Enjoy/Good at Teaching	28	I possess the qualities of a good ag teacher.
	29	I enjoy teaching about agriculture.
Student Teaching	30	Student teaching.
	31	The foundation of my student teaching experience.
Agricultural Work Experience	32	My previous agricultural work experience.
	33	The previous jobs I have had in the agricultural industry.
4-H	34	My involvement in 4-H.
	35	My participation in 4-H when I was younger.
Age	36	My age.
	37	The role of a person my age in agricultural education.
Coaching/Competition	38	I enjoy the coaching aspect of agricultural education.
	39	I love the competition in ag.
Former Teacher Influence	40	My high school ag teacher.
	41	Influence of other high school teachers.
University Faculty	42	The influence of my university supervisor.
	43	Other university faculty or staff.
Cooperating Teacher Influence	44	My cooperating teacher's influence.
	45	The relationship I have with my cooperating teacher.
Fallback Career	46	I was unsure of what career I wanted.
	47	Teaching ag was my fallback career.
Race/Ethnicity	48	My ethnicity.
	49	The role of my ethnicity in agricultural education.
Professional Status	50	Teaching ag is a high status occupation.
	51	Ag teachers are perceived as professionals.
Location	52	A teaching qualification is recognized everywhere.
	53	Teaching ag will allow me to choose where I wish to live.

Note. Each of these statements was printed on an individual card used for the participants' Q sort.

P-set

In Q Methodology, the P-set is the group of participants (Watts & Stenner, 2012). For this study, the focus was the undergraduate students in the Texas A&M University Agricultural Science program that intended to student teach in the fall of 2017 or the spring of 2018. These students were classified as preservice teachers as they had long declared Agricultural Science as their major. Prospective participants had completed the required hours of clinical observation in the classroom and were currently enrolled in required classes prior to the student teaching semester or classes that were required for student teaching. The main criteria that was looked for in prospective participants was the strong aspiration to teach. Lengthy and intermittent qualifying conversations over the last three semesters with each of the participants allowed me to determine the strength of their desire to teach.

Normally in Q Methodology, the P-set is smaller than the Q-set. Number of participants is not a priority for studies of this nature to be reliable, but Watts and Stenner (2012) do suggest one participant in the P-set for every two Q-set statements. With a Q-set of 53 statements, this gave me a P-set number of 26 to aim for. More importantly, participants with vastly differing perspectives was desired over meeting the proposed number of participants, therefore purposive sampling was utilized in this study (Watts & Stenner, 2012). I took observational and mental notes about potential participants' backgrounds and perspectives during the qualifying conversations with each student. Consequently, students from a variety of backgrounds in agricultural education from differing areas in Texas were chosen. Other criteria that I noted included school size, type of SAE, FFA involvement, and main emphasis of home program. Participants were gathered from the greatest variation of gender, ethnic background, and socioeconomic status, creating a strategic approach to participant selection that represented the widest variety of viewpoints (Watts & Stenner, 2012). These students were studied voluntarily with forced-choice distribution Q sorts combined with face-to-face interviews.

Q Sort

Q sort was the data collection tool utilized in Q Methodology; it involved the participants physically ranking the statements in the Q-set systematically (Brown, 1993). Each statement was printed on a card assigned with a random number and presented to the participant in a complete deck of cards that the participant sorted along a continuum from most important at one end to least important at the other end (Brown, 1993). Each of the participants from the P-set ended up with unique sorting of statements in a forced normal distribution (van Exel & de Graaf, 2005; Watts & Stenner, 2012). For this study, there were 53 statements to be sorted and Brown (1993) suggested that, for a Q-set of 40-60 items, an 11 point (-5 to +5) distribution should be utilized. Watts and Stenner (2012) recognized all the procedures put forth by Brown (1993), but also stated that they are simply guidelines. Therefore, when forming the shape of the distribution, the knowledge and familiarity the P-set has with the subject at hand and the sampling method used needed to be the ultimate deciding factors (Watts & Stenner, 2012). If the knowledge and familiarity of the subject is low, the kurtosis will be higher, which creates a steeper distribution that allows the participants to place more items in the middle of the distribution. A steeper distribution is associated with a P-set that was arrived at by means of opportunity sampling as this type of distribution requires less decision-making on the part of the participants (Watts & Stenner, 2012). If the knowledge and familiarity are high, the distribution should be shallower with a playtykurtic slope or kurtosis closer to zero (Watts & Stenner, 2012). A flattened or platykurtic distribution requires participants to make fine-grained discriminations at both extremes. In this study, the participants were purposefully chosen as they had a high level of knowledge and were experts on their personal viewpoint about deciding to teach agricultural science as they would soon make the decision upon graduation. Therefore a shallower, 13 point (-6 to +6) distribution, shown in Figure 3, was utilized (Watts & Stenner, 2012). Although this was a wider distribution than Brown (1993) recommended for a Q set of 53 items, it was still near the range and followed the guidelines for kurtosis of the distribution.

A replica of this 13 point distribution was printed on an 8' x 42" poster, excluding the number values at the bottom. It will be referred to subsequently as the form board that the participants physically sorted the Q-set statements onto. The form board was designed to assist participants in deciding which statements were most important in their decision to teach (associated with the positive values) or least important in their decision to teach (associated with the negative values).

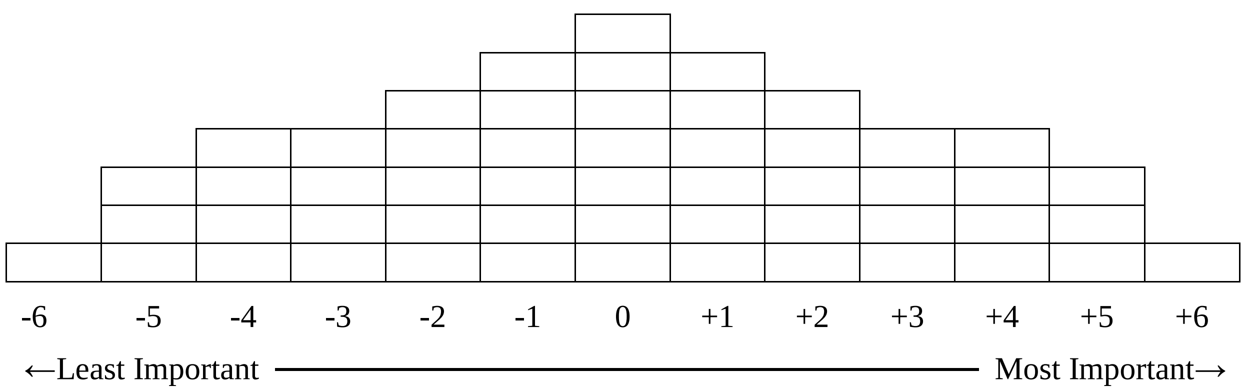

Figure 3. Form Board.

In executing the Q sort, it is recommended that the participant categorize the stack of randomly numbered statements into three piles: statements they feel are definitely important, statements they feel are definitely unimportant, and statements they feel indifferent about or feel they do not apply (Watts & Stenner, 2012). I then asked the participant to look at the cards once more to be sure they had them in the pile they desired and then had them count the number of cards in each pile. According to Redwine (2014), "this allows the researchers to note how many items were sorted into each category" (p. 36). I then asked the participant to pick the pile they would like to start with and set the other two piles aside until they had the first one sorted into the distribution as preferred (Watts & Stenner, 2012). I explained to the participant that they could move the cards around on the form board as they wished, but could not start with a different pile until the first one was set on the form board as they wanted. The same process was followed with the two remaining piles. This follows the guidelines that Watts and Stenner (2012) outline for execution of a Q sort.

During the Q sort, I asked participants to elaborate on the reasoning behind their sorting of statements and talk through their mental processes, while being audio recorded. I also asked the participants to explain statements that invoked a strong reaction, verbal or nonverbal. I took notes of the physical sorting, the participants' spoken thought processes, and non-verbal body language. I asked clarification questions if needed during the Q sort. After the Q sort, I asked participants follow up questions in the form of an exit interview about anything that caught my attention, or statements I wanted the participants to elaborate on. Field notes were taken while the participant was being interviewed; this was also audio recorded.

After the participant had left the room, I copied the statement numbers from the participant's Q sort onto a sheet of paper that contained a blank depiction of the form board. I also took pictures of the participant's completed Q sorts for archival purposes, and to verify that I had copied their answers correctly.

Prior to the Q sort, each participant was given an information sheet about the study, acknowledging that their agreement was their verbal consent to participate in the study and be audio recorded. The Q sorts and interviews were conducted individually with participants in December of 2017 and January of 2018. The combination of the Q sort and interview lasted between 15 and 60 minutes. Identities of all participants were kept confidential and data was coded prior to being analyzed. This study was reviewed and approved by the Institutional Review Board in compliance with Texas A&M University's Human Subject Research requirements (IRB2017-0876M).

Factor Analysis

Factor analysis is a data reduction method (Watts & Stenner, 2012) and is used to identify groups or clusters of data (Field, 2009). Two reasons factor analysis are used are "to understand the structure of a set of variables" (p. 628) or to reduce the data set to a more manageable size while retaining the most original information (Field, 2009). Field (2009) alludes to the fact that there are three distinct steps to factor analysis: factor extraction, factor rotation, and factor interpretation.

In order to locate the clusters or groups of data, the variance of the complete study must be looked at first. The total variance of a study reflects the nature and extent of the relationships that exist between all the variables in a study or the relationship of each variable with every other variable shown within a correlation matrix (Watts & Stenner, 2012). The variables in this study were the individual Q sorts. The clusters of data are identified by portions of shared meaning that we call factors. The clusters of data that are found to share a significant amount of meaning or variance will be kept for further analysis.

Identification of these significant factors is called factor extraction. This is where the power of statistics comes into play; how we decide which of those factors is significant and worthy of keeping. With every factor that emerges from a set of data, an eigenvalue is assigned to it based on the percentage of variance that factor explains. “Typically, there will be a few factors with quite high eigenvalues, and many factors with relatively low eigenvalues” (Field, 2009, p. 639). Field (2009) suggests graphing the eigenvalues for each of the factors and only keeping the factors that fall before the point the slope of the line changes dramatically. There are two criterion that have also been established for retaining factors based on the numeric value of eigenvalues (Field, 2009). The first is the Kasier-Guttman criterion that suggests keeping factors with an eigenvalue greater than 1 (Watts & Stenner, 2012). The second recommended by Joliffe, states that the Kaiser-Guttman criterion is too strict and factors with eigenvalues above 0.7 should be kept (Field, 2009). Factor extraction will reduce the number of factors to a more manageable number that still explains a great deal of variance.

After factors have been extracted, they need to be rotated in order to “calculate to what degree variables load into these factors” (Field, 2009, p. 642) Typically, most variables will load on the factor with the highest eigenvalue, so rotation of the factors around a central axis point is needed in order to allow the variables to load maximally on a single factor (Field, 2009). Factor rotation does not change the positions of the variables in relation to one another, it simply allows us to rotate one particular factor about the axis in order “that an appropriate group of variables are brought as close as possible to the pole of its factor axis” (Watts & Stenner, 2012, p. 119).

The final step in factor analysis is factor interpretation. This involves looking at how close each variable is in relation to the factor that it loaded on and then creating a holistic description of each factor. Some researchers suggest using all the variables that loaded for a factor, while others suggest tightening that up and using a higher threshold for factor interpretation. For example, if I considered a variable to be significant for a particular factor at a baseline of 0.35, I could increase that significance to 0.55 for use in factor interpretation (Watts & Stenner, 2012). These principles of factor analysis were applied in Q Methodology, in accordance with standards outlined by Watts and Stenner (2012).

PQMethod Data Analysis

Following the Q sorts and using the manually copied form boards, I entered the data for each individual sort into PQMethod to be stored and then analyzed. All Q sort data were analyzed in PQMethod 2.35, created by Peter Schmolck (Schmolck, 2014).

Factor Extraction

The first step in factor analysis is factor extraction (Field, 2009). In Q Methodology, there are two options for determining how many factors to extract: principal component analysis and centroid analysis. For this study, principal component analysis was utilized to calculate an unrotated factor matrix that brought out the variance in the data. This was strictly on recommendation from Watts and Stenner (2012). Watts and Stenner (2012) also recommend that the number of factors the researcher extracts should be a manageable number based on some criteria, which, in this case, is the Kaiser-Guttman criterion, described above.

Factor Rotation

Factor rotation was the next step (Field, 2009). Factor rotation can take place in two ways: the theoretical, by-hand technique, or by automatic varimax rotation. For this study, the varimax procedure completed by PQMethod was used to rotate the factors. The varimax procedure "will rotate the factors for you, positioning them according to statistical criteria and so that, taken together, the factors account for the maximum amount of study variance" (Watts &

Stenner, 2012, p. 122). Watts and Stenner (2012) suggest varimax rotation as it is easily used with larger data sets, "will be seen as objective and reliable" (p. 125), and is the best choice if the priority of the study is viewpoints "that almost everybody might recognize and consider to be of importance" (Watts & Stenner, 2012, p. 126).

Factor Interpretation

Following the varimax rotation, the individual sorts that aligned closely with each factor had to be flagged. Flagging simply means that the Q sort was manually marked with an X for the factor that it aligned with as a way to visually examine the factor loadings as a whole. Watts and Stenner (2012) strongly suggest to **not** let PQMethod automatically flag the factors and offer the following equation to determine what factor loadings are significant:

Significant factor loading = 2.58 x (1 ÷ √no. of items in the Q set)
= 2.58 x (1 ÷ √53)
= 2.58 x (1 ÷ 7.2801)
= 2.58 x 0.1373
= **0.3542** rounded up to ± **0.35**

A flag indicated a Q sort loaded at 0.35 or higher and was affiliated closely with the viewpoint of that particular factor. For this study, these significant Q sorts were all retained to create the factor estimate or a holistic characterization of that viewpoint. These factor interpretations were combined with qualitative data from the exit interviews to create in-depth descriptions of each viewpoint.

Constant Comparative Analysis

As a conclusion of the Q sort exit interview, the participants were asked a single question related to research question four: "Can you pinpoint a time and place when you decided you wanted to teach?" The responses were audio recorded and field notes were taken. The data from these responses were analyzed using the constant comparative method (Lincoln & Guba, 1985).

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to develop an understanding of the beliefs and opinions Texas A&M University Agricultural Science students have about teaching as a career path. I intended to explore the impact of the components of the Agricultural Science Program on students' decision to teach, and external motivators that have an influence on that decision.

Results and Discussion Related to Research Question One

RQ1: What are the viewpoints of Texas A&M University Agricultural Science students about a career in teaching?

To address the first research question, 20 Q sorts were conducted with the 53 statements that I developed from the concourse. Of the 20 Q sorts, only 8 were significant (±0.35) on a single factor. A correlation matrix of all Q sorts was created that displays the relationship between all Q sorts (Appendix D). This indicates that 100% of the variance is accounted for in the relationship of every Q sort to every other sort in the study.

I followed Watts and Stenner's (2012) guidelines for principal component analysis by including all of the participants (Q1 to Q20) for the factor analysis. The unrotated factor matrix generated through principal component analysis is shown in Table 4. This includes the unrotated factor loadings, the eigenvalues for each factor, and the percentage of variance that is explained by each factor and cumulatively explained. Using the Kaiser-Guttman Criterion of keeping factors with a minimum eigenvalue of 1.00, I chose three factors for factor extraction: *Mindful, Methodical Mentors*, *Purposeful, Practical Planners*, and *Collaborative, Cultural Cultivators*. These were the viewpoints that emerged from the P-set of undergraduate students in the Texas A&M University Agricultural Science program that student taught in the fall of 2017 or the spring of 2018. These three factors were then rotated automatically with varimax rotation. Table 4 also includes the pseudonyms that were assigned to each of the participants. They were assigned names alphabetically in the order they completed the Q sort; these names will be utilized throughout the remainder of this study to identify participants.

When looking at the unrotated factor matrix in Table 4, some might question why a four factor solution was not utilized, rounding up the eigenvalue for the fourth factor, and therefore increasing the total percentage of variance explained. Although the Kasier-Guttman Criterion are set forth by Watts and Stenner (2012) purely as a guideline, it rang true for this set of Q sort data. A four factor solution may have explained more of the variability, but, in turn, it would have compromised the validity and reliability of the factor characterizations. Ultimately, the objective was not to simply explain the greatest amount of variance, but to offer a hearty explanation for each of the factors that surfaced.

Table 4.

Unrotated factor matrix.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Q1-Andie	0.62	-0.37	0.06	0.50	-0.27	0.15	0.02	0.19
Q2-Becky	0.77	-0.08	0.10	-0.25	-0.28	0.23	0.05	-0.11
Q3-Carmen	0.82	-0.02	0.02	-0.37	-0.01	-0.12	0.01	0.03
Q4-Devon	0.53	0.51	-0.33	0.18	0.02	-0.34	-0.34	0.15
Q5-Evan	0.71	-0.47	-0.31	-0.07	0.03	-0.25	-0.03	0.13
Q6-Felicia	0.78	0.26	-0.13	-0.04	-0.08	0.23	-0.25	0.01
Q7-Gwen	0.79	0.01	-0.16	-0.36	0.05	-0.16	0.24	0.01
Q8-Harrison	0.78	-0.14	0.10	0.13	0.42	-0.10	-0.04	0.12
Q9-Imogene	0.84	-0.27	-0.28	-0.11	-0.06	-0.03	0.07	0.06
Q10-Joram	0.91	-0.03	-0.11	0.12	-0.01	-0.08	0.10	-0.12
Q11-Kelsey	0.86	0.05	-0.05	0.17	-0.00	-0.04	-0.00	-0.09
Q12-Louise	0.57	0.61	0.14	0.01	0.02	0.24	0.23	0.35
Q13-Makayla	0.78	-0.06	0.18	0.01	0.20	-0.01	0.06	-0.14
Q14-Nathaniel	0.67	-0.09	0.01	0.03	0.57	0.36	-0.00	0.02
Q15-Olive	0.80	-0.20	-0.14	0.03	-0.20	0.21	-0.15	0.13
Q16-Piper	0.78	0.12	0.23	0.20	0.05	0.10	-0.18	-0.39
Q17-Ruth	0.44	-0.25	0.76	-0.07	-0.08	-0.20	-0.16	0.21
Q18-Stella	0.83	0.07	-0.04	-0.13	-0.14	0.23	-0.15	-0.19
Q19-Teri	0.69	0.17	0.02	0.34	-0.13	-0.15	0.46	-0.11
Q20-Whitley	0.73	0.33	0.26	-0.17	-0.10	-0.17	-0.01	0.03
Eigenvalues	11.02	1.42	1.13	0.90	0.80	0.74	0.62	0.53
% Variance Explained	55	7	6	5	4	4	3	3
% Cumulative Variance	55	62	68	72	76	80	83	86

Following the varimax rotation, the individual sorts that aligned closely with each factor were flagged for factor interpretation, the final step in factor analysis (Field, 2009). This indicated they were the defining sorts for that particular factor and were a close estimate for that factor. Defining sorts loaded at 0.35 or above, best represented that specific factor, and were marked with an X. Table 5 shows the factor loadings for the three factors. Confounding sorts were those that loaded above ± 0.35 on more than one factor. Sorts that did not load on any one factor were considered non-significant. Of the 20 sorts, a total of 8 were significant (Andie, Evan, Imogene, Nathaniel, Olive, Devon, Louise, and Ruth). The sorts for Andie, Evan, Imogene, Nathaniel, and Olive were flagged for Factor 1. Devon and Louise had the sorts that were flagged for Factor 2. Ruth was the sort that was flagged for the third, and final, factor. The remaining 12 sorts were confounding sorts as they loaded at 0.35 or above for two or more factors (Becky, Carmen, Felicia, Gwen, Harrison, Joram, Kelsey, Makayla, Piper, Stella, Teri, and Whitley). Although these sorts were not used to build the characterizations of the three emergent viewpoints, they did contribute to the construction of the final model.

Table 5.

Factor matrix with an X indicating a defining sort.

Sort	**Factor 1 Loading**	**Factor 2 Loading**	**Factor 3 Loading**
Andie	**0.65 X**	0.07	0.32
Becky	0.58	0.39	0.35
Carmen	0.61	0.47	0.27
Devon	0.23	**0.72 X**	-0.25
Evan	**0.91 X**	0.05	0.03
Felicia	0.48	0.67	0.06
Gwen	0.64	0.48	0.09
Harrison	0.62	0.35	0.36
Imogene	**0.88 X**	0.29	0.06
Joram	0.74	0.52	0.18
Kelsey	0.63	0.55	0.21
Louise	0.03	**0.82 X**	0.17
Makayla	0.54	0.41	0.42
Nathaniel	**0.54 X**	0.33	0.23
Olive	**0.76 X**	0.31	0.16
Piper	0.43	0.55	0.43
Ruth	0.16	0.05	**0.89 X**
Stella	0.59	0.55	0.21
Teri	0.41	0.54	0.20
Whitley	0.26	0.70	0.40
No. of Defining sorts	**5**	**2**	**1**

The three factor solution produced reliability coefficients of 0.80 for each of the three factors that indicated that a three factor solution was reliable. The composite reliability is shown for each factor in Table 6.

Table 6.

Reliability of three factor solution.

	Factor 1	**Factor 2**	**Factor 3**
Composite Reliability	0.952	0.889	0.800

To further ensure the reliability of a three factor solution, the correlation between the factors was calculated. Schmolck (2014) states that this is crucial in determining that the chosen solution does not contain too many factors.

> Over-factoring, i.e., rotating more factors than there exist distinct perspectives, results in conspicuously high factor score intercorrelations. A reasonable rule of thumb would not, except for well-founded reasons, accept a factor solution with factor score intercorrelations in the order of magnitude of the factor loadings of those sorts that appear suited to represent a factor (Schmolck, 2014, Section 7-QAnalyze, para. 13).

These recommendations were followed and the factor intercorrelation values are summarized in Table 7.

Table 7.

Intercorrelation between factors.

	Factor 1	**Factor 2**	**Factor 3**
Factor 1	1.00		
Factor 2	0.3455	1.00	
Factor 3	0.3152	0.1274	1.00

Results and Discussion Related to Research Question Two

RQ2: What are the characteristics that make up each of the viewpoints?

After factor rotation, PQMethod presents a table that displays the ideal arrangement of statements that would result in a perfect factor loading for each of the three factors. Table 8 summarizes those Q sort values of each statement for each factor. This allows similarities and differences to be easily seen between the perfect sorts (Appendices E-G) for the three factors. For example, statements such as 7 and 44 show a close consensus across the three factors, being assigned a negative value, while there was disagreement for statements 11 and 12. This means 11 and 12 would be found at opposite ends of the form board if the ideal sorts were arranged to be viewed. The ideal Q sort for Factor 2 would rank statements 11 and 12 positively, while the ideal sorts for Factor 1 and Factor 3 would negatively rank them.

Table 8.

Q sort values for statements.

Statement	**Q sort Value for Factor 1**	**Q sort Value for Factor 2**	**Q sort Value for Factor 3**
1	-3	-5	0
2	-4	-4	0
3	6	3	0
4	4	2	0
5	-2	-1	-4
6	-5	-3	-4
7	-4	-3	-3
8	-1	1	-3
9	4	-1	-1
10	5	0	-1
11	-3	6	-4
12	-5	4	-4
13	2	1	3
14	3	-2	0
15	3	3	-2
16	4	0	-1
17	4	0	1
18	5	1	1
19	5	-1	2
20	1	2	4
21	1	4	5
22	0	5	2
23	0	4	2
24	-1	4	5
25	0	4	4
26	3	1	1

Table 8. Continued.

Statement	**Q sort Value for Factor 1**	**Q sort Value for Factor 2**	**Q sort Value for Factor 3**
27	1	2	4
28	2	1	-2
29	2	3	1
30	0	5	-2
31	2	-2	-1
32	2	-5	6
33	1	-5	3
34	-2	-1	-5
35	-3	-1	-6
36	-4	-4	-5
37	-2	-3	-5
38	3	2	1
39	0	2	4
40	0	0	5
41	1	0	2
42	-2	-2	0
43	-1	-3	1
44	0	-1	-1
45	-1	1	0
46	-2	-1	2
47	-6	-6	-3
48	-5	-4	3
49	-4	-4	3
50	-1	0	-2
51	1	-2	-1
52	-1	-2	-2
53	-3	3	-3

PQMethod generates a list of distinguishing statements for each factor accompanied by a Z score for each statement relative to that factor. Distinguishing statements are those “items that a particular factor has ranked in a significantly different way than all the factors” (Watts & Stenner, 2012, p. 217). Z scores are used to surface that significant difference. Table 9 identifies the distinguishing statements for Factor 1, Table 10 identifies distinguishing statements for Factor 2, and Table 11 identifies distinguishing statements for Factor 3. Following each table of distinguishing statements for each of the three factors is a robust description of that particular viewpoint.

Table 9.

Distinguishing statements for Factor 1.

Statement No.	Statement	Q sort value	Z
3	My desire to make a difference in the lives of students I teach.	6	1.96
10	I am helping influence the next generation.	5	1.67*
19	I want to change the misconceptions about agriculture.	5	1.67
18	My desire for my students to have a knowledge of agriculture, regardless of their career pursuits.	5	1.60
9	Teaching ag allows me to provide a service to society.	4	1.55*
4	Serving as a positive role model for students.	4	1.45
17	I have a desire to share my passion for agriculture.	4	1.37
16	My desire to grow a program for students and not just a class.	4	1.28*
14	I cherish spending time with students.	3	1.14
31	The foundation of my student teaching experience.	2	0.74
32	My previous agricultural work experience.	2	0.53*
21	The involvement I had in agriculture classes when I was in high school.	1	0.10*
25	The involvement I had with my SAE project in high school.	0	-0.00*
24	My participation in SAE in high school.	-1	-0.27*
35	My participation in 4-H when I was younger.	-3	-0.96

Note. * indicates $p < .01$

The first viewpoint that emerged, *Mindful, Methodical Mentors*, was comprised of five Q sorts (Andie, Evan, Imogene, Nathaniel, and Olive) and accounted for 55% of the total variance. Distinguishing statements for the Q sorts that loaded for Factor 1 are displayed in Table 9. The Mindful, Methodical Mentors viewpoint favors the statements that are focused on the individual student and the passing of their own passion and knowledge of agriculture to the next generation.

This viewpoint truly believes that their role as an agricultural science teacher is the best contribution they can make to this world by mentoring young minds, in agriculture and, in general. They strive to be an encouraging mentor in order for their students to become productive members of society. For the Mindful, Methodical Mentors, the focus is always agriculture and they want their future students to walk out of the classroom with a better knowledge of the subject. However, there is a greater desire to serve their students and lead by example by being a positive role model. The Mindful, Methodical Mentors recognize that students spend a great deal of time at school, and they, as teachers, have a chance to use that time, systematically and persistently, to make a difference in the lives of those students. This quote paints a good picture of this viewpoint as a whole, “I focus more on the bigger picture of wanting to be a positive role model, an inspiration, teaching them [high school students] what agriculture actually is…” (Imogene).

The Mindful, Methodical Mentors associated a high value with the statement, ‘My desire to make a difference in the lives of students I teach.’ “Being able to share the knowledge that I’ve gained and, you know, help make a difference on someone else’s life, just like I had an ag teacher that made an influence on mine” (Nathaniel). “Because a lot of them [high school students] go through things that we never would’ve thought possible so, they come and talk to you about their lives…they’re always trying to find someone to look up to, especially if they don’t have anyone at home or an older sibling that has done well in life” (Andie).

Nathaniel stated, “Being able to be a positive impact on someone’s life and change, you know, their life for the better, is the biggest thing you could ever do.” Evan thought a while about some of the students he had during student teaching before he responded:

> I just─I'm not really a fan of the way the newer generation of kids, like, even act now, let alone the things they, kind of─that are popular in their culture nowadays. But I feel like if they have those positive role models, they'll kind of offset the things that they don't get at home, like, how to act, how to behave, how to carry yourself" (Evan).

The Mindful, Methodical Mentors realize the broken nature of our society commenting, "It's just the lack of role models" (Evan). "Serving as a positive role model…is one of the most important things because you don't want to have a negative role in students' lives" (Olive). Evan summed it up, "Providing a service [to society], that's another big thing to be, like, a contributing member of society…in a position that actually matters and makes a difference."

The Mindful, Methodical Mentors actually do cherish spending time with students and strive to develop a relationship with each individual student, "…when I was student teaching, they are the ones who always said 'good morning' and always tried to make my day better.." (Andie). Olive went on to say:

> Spending time with students is kind of important because you need to build a relationship with your students and get on a level with them where they understand you and understand where you're coming from and you also understand them because if you don't have a relationship with them and you don't understand what's going on outside the classroom…you could be adding more stress or issues with them that they might be having at home (Olive).

Combatting the untruths about agriculture that are spread so quickly through our society is also of extreme importance to the Mindful, Methodical Mentors. "There's such a misconception about it [agriculture] for a lot of people and there's a lot of people that just don't even know what ag is" (Imogene). "I want to change the misconceptions about agriculture, a lot of my students didn't know a lot of things and it [classes in agricultural science] got them excited to learn more about ag and even take that home with them so they can go tell their families about that" (Andie).

Along with teaching about agriculture, "developing an amped up program, a program that people can be proud of, not just a class that teaches them [students] things…that has all aspects like SAE, FFA, and classroom instruction" (Evan) is important. Spending time with students inside and outside the classroom also presents an opportunity for the Mindful, Methodical Mentors share their own passion:

> I've always done that [shared a passion for agriculture] and I think I'm really good at that! I think it's really important to impress upon kids in high school my passion for it [agriculture], that way, whether they have a passion for agriculture and they want to pursue that or they find that they have a passion for something else, like I had a passion for ag, that they can apply it there. So I think showing that and that you can have a passion about something, even if it's something small, that you can turn it into something big" (Imogene).

Table 10.

Distinguishing statements for Factor 2.

Statement No.	Statement	Q sort value	Z
11	Teaching ag allows time for family.	6	2.17*
30	Student teaching.	5	1.49*
12	The hours of a teacher fit well with family responsibilities.	4	1.21*
53	Teaching ag will allow me to choose where I wish to live.	3	0.92*
35	My participation in 4-H when I was younger.	-1	-0.14
43	Other university faculty or staff.	-3	-1.20
32	My previous agricultural work experience.	-5	-1.64*
33	The previous jobs I have had in the agricultural industry.	-5	-1.64*

Note. * indicates p < .01

The second viewpoint that emerged, the *Purposeful, Practical Planners,* was comprised of two Q sorts (Devon and Louise) and accounted for 7% of the total variance. Distinguishing statements for the Q sorts that loaded for Factor 2 are depicted in Table 10. Gleaning experience, good or bad, from student teaching has given the Purposeful, Practical Planners practical advice as they move towards their decision of becoming an agricultural science teacher. The Purposeful, Practical, Planners already have a heart for their future families. This makes them purposeful in choosing a career conducive to the responsibilities and time commitments that come with building a family.

Louise has always had a family in mind when it comes to her future and immediately sorted the two statements related to the family at the highest value of the form board: “I’m pretty sure this is going to be my most important because I want to be a teacher─the first reason was because I want to have summer breaks to have with my [future] kids and my first career option is a mother." Devon echoed that, "That's kind of important to me because I was─soon have kids. My family responsibility would be my teaching hours so they kind of go hand in hand. When they're [my children] working on their FFA projects and when I'm teaching, so that's important to me." Louise mentioned that choosing where she wants to live goes along with having a family, "I want to be able to live where I want to and there's schools everywhere, so that makes it easy."

To Devon, a big part of his student teaching experience was the interactions he had with his cooperating teacher saying, "Yes, that's important because they're the last person that I see before I actually throw myself out there to actually getting a real job and being on my own, so that's very influential."

> It [the student teaching experience] all just kind of washes away once you leave. My situation was limited…because you bring something cool or fun for these youngsters to do…but then, no matter what you do you have to run it by your cooperating teacher…and the cooperating teacher always has a chance to shoot it down. I ran across that multiple times where there was several projects that I wanted to do that would have lasted three to four days, but it would have put us behind on his schedule. It was still his classroom, his students, because when I leave he takes over for the three weeks before Christmas and he's taking over the three weeks after Christmas for the next student teacher to come it. It makes the cooperating teacher see it as, 'Let's just keep them [students] going and keep them moving. I don't have time to incorporate all your learning styles. Let's just kind of stay on my track'…and when the new person [student teacher] comes in he kind of does the same (Devon).

Louise had only been in her cooperating high school three weeks, but she had already realized the magnitude of the student teaching experience, “Just because how this turns out will effect whether or not this is what I actually do.”

> If I absolutely hate it [teaching agricultural science] in May, I guess I’m going to look for something else to do. But hopefully, by May, I’ll realize, ‘Wow, I can do this’ and then that’ll make me decide that, yes, I will become a teacher, but there’s always the chance that these couple of months [during student teaching] will make me decide that that’s not what I want to do (Louise).

Table 11.

Distinguishing statements for Factor 3.

Statement No.	Statement	Q sort value	Z
32	My previous agricultural work experience.	6	1.99*
40	My high school ag teacher.	5	1.66*
48	My ethnicity.	3	0.99*
49	The role of my ethnicity in agricultural education.	3	0.99*
1	My gender.	0	0.00
2	The role of my gender in agricultural education.	0	0.00
28	I possess the qualities of a good ag teacher.	-2	-0.66
15	I want to develop a well-rounded program that involves classroom instruction, FFA, and SAE.	-2	-0.66*
35	My participation in 4-H when I was younger.	-6	-1.99

Note. * indicates $p < .01$

The final viewpoint that emerged, the *Collaborative, Cultural Cultivators,* was comprised of only one Q sort (Ruth) and accounted for 6% of the total variance. Distinguishing statements for the Q sorts that loaded for Factor 3 are displayed in Table 11. The Collaborative, Cultural Cultivators took significant parts of their previous work experience, interactions with their high school agricultural science teachers, and their ethnicity, and combined those when making their decision to teach. The Collaborative, Cultural Cultivators have had a wide variety of experiences inside and outside of the classroom, working with numerous animals, plants, and other people. The diverse individuals that the Collaborative, Cultural Cultivators had as agricultural science teachers had a huge impact on their learning and growing as well on their decision to teach. The Collaborative, Cultural Cultivators desire to utilize the uniqueness of their ethnicity in the career of teaching agricultural science, but also do not want their ethnicity to be their sole defining characteristic as an agricultural science teacher.

Initially Ruth said, “I think my jobs is [sic] the most important thing because I’ve worked at vet clinics, I’ve worked at Lowe’s…realized, ‘yes, I liked the field [of agriculture]’.” After probed to think deeper about how her previous agricultural work experience had affected her decision to enter the field of teaching Ruth stated, “Dealing with adults─I’d rather deal with kids…I’d rather be in a room with students all day than to be with complaining adults. The one thing I did like about Lowe’s was that─working in the garden center. Even though it was summer time, they [supervisors] would switch us out every 30 minutes because it was that hot, but just─I loved, I don’t know, I just loved being out there.”

She spoke about three agricultural science teachers that had a huge impact on her decision. One, who taught her veterinary medicine and helped with the vet tech CDE (Career Development Event), Ruth recalled, encouraged her to run for FFA office. “I still regret to this day…I wish I had ran for FFA office…I wish that I’d tried because then I would know if I did it or not─if I got it or not”. Another, who taught Ruth floral design and small animal management, “She was just really warm and very, like, cheerful. I was her, like, I was her teacher’s pet. It was me and [friend], and she’d be, like, ‘Okay, girls go run this to the office for me or, like, go do this for me and here’s a pass to get you out of class [laughs]’…so, yeah, she was probably my favorite.” The interactions with the third teacher were not as positive. “He was my swine advisor…I had─I still have negative interactions with him. He’s very straight-faced and he has, like, a dark sense of humor [laughs] and so he’s just not very warm and inviting, like everyone else. When he was my advisor for my gilts, like, he wasn’t that helpful” (Ruth). Despite having multiple, mostly positive, interactions with various agricultural science teachers, none of them ever told Ruth that she should be an agricultural science teacher. “It never crossed my mind, even though they were right in front of me” (Ruth).

The aspects of demographics were made apparent with this viewpoint: “I think being a black ag teacher is important, because I had─I didn’t get to see a lot of that in this area. But, then again, I don’t want to be defined, like, ‘Ohh, there’s the black ag teacher’” (Ruth).

Across the three viewpoints, participants who loaded with any factor disagreed with the following four statements: “My friends think I should become an ag teacher”, “Ag teachers are well paid”, “My age”, and “Teaching ag was my fallback career.” These viewpoints, although appreciative of encouragement from friends said, “It doesn’t really matter to me, they’re not the ones that are going to do my job” (Gwen). In regards to the pay of agricultural science teachers, Imogene said, “that was never a concern for me, you know, education, as a whole, not even just ag ed, but education in general─it’s more of a labor of love.” “I’ve never really thought being paid well had much to do with why I wanted to be a teacher” (Stella). Teaching agricultural science was not a fallback career for these pre-service teachers. Age was also of little importance for these individuals in their decision to teach.

Results and Discussion Related to Research Question Three

RQ3: What do we know about the persons who identify with each viewpoint?

Participants in this study were all selected from a group of Texas A&M University Agricultural Science students who have expressed a strong desire to enter the career of teaching post college graduation. These were students that completed their student teaching semester in either the fall of 2017 or the spring of 2018. Participants represented both genders across a wide variety of agricultural education backgrounds, graduating from high school programs of varying magnitude and areas of emphasis. The complete descriptive characteristics of the P-set are shown in Table 12.

Andie, Evan, Imogene, Nathaniel, and Olive’s Q sorts were flagged for loading significantly for Factor 1, the Mindful, Methodical Mentors. Andie, Imogene, Nathaniel, and Olive shared similar demographics in that they all attended Class 6A Texas High schools, whereas Evan attended a much smaller Class 2A High School. Andie, Imogene, and Olive were female, and Evan and Nathaniel were male. Andie and Evan student taught in the fall of 2017 while Imogene, Nathaniel, and Olive completed their student teaching experience in the spring of 2018. Andie, Imogene, and Nathaniel were of Hispanic descent; Evan and Olive were Caucasian.

Devon and Louise’s Q sorts were flagged for loading significantly for Factor 2, the Purposeful, Practical Planners. Devon and Louise shared similar demographics in that they were both Caucasian and completed their student teaching experience in the spring of 2018. Devon was a male who attended a Class 3A Texas high school. Louise was a female who attended a large Class 6A Texas high school.

Ruth’s Q sort was the only one that was flagged for significantly loading for Factor 3, the Collaborative, Cultural Cultivators. Ruth is an African American female who student taught in the spring of 2018 and attended a Class 6A Texas high school.

Table 12.

Descriptive characteristics of P-set.

Participant	Gender	Student Teaching Semester	Classification	High School Graduation Class Size
Andie	F	Fall 2017	Senior	485
Becky	F	Fall 2017	Senior	140
Carmen	F	Fall 2017	Senior	400
Devon	M	Fall 2017	Senior	117
Evan	M	Fall 2017	Senior	39
Felicia	F	Spring 2018	Senior	120
Gwen	F	Spring 2018	Senior	832
Harrison	M	Spring 2018	Senior	980
Imogene	F	Spring 2018	Senior	1000
Joram	M	Spring 2018	Senior	150
Kelsey	F	Spring 2018	Senior	469
Louise	F	Spring 2018	Senior	526
Makayla	F	Spring 2018	Senior	27
Nathaniel	M	Spring 2018	Senior	650
Olive	F	Spring 2018	Senior	650
Piper	F	Spring 2018	Senior	990
Ruth	F	Spring 2018	Senior	600
Stella	F	Spring 2018	Senior	822
Teri	F	Spring 2018	Senior	78
Whitley	F	Spring 2018	Graduate	127

Results and Discussion Related to Research Question Four

RQ4: When do students in the TAMU AGSC program decide to enter the field of agricultural education as a teacher?

In order to accomplish Research Question Four, a single question was asked at the conclusion of the Q sort and the exit interview. The question was "Can you pinpoint a time and place when you decided you wanted to teach?" Surprisingly, 18 of the 20 participants recalled a moment when they made the decision to teach agricultural science at the high school level. There were three main themes that arose out of the responses: *High School*, *College*, and *A Gradual Decision*. Most of the participants needed little thought before they had a specific moment they recalled in great detail.

High School

Of the 20 participants in this study, 12 stated that they made the decision to teach agriculture science in high school. Within the group of students that reported making the decision in high school, there were inklings towards two sub groups, those that decided early in high school (4) and those that decided their senior year (8). Kelsey decided that she wanted to teach agricultural science at a very early stage in high school saying:

> Yes, freshman year, about the second week of school…I knew I've always wanted to teach, but I didn't know what I wanted to teach and then walking to the ag shop and, like, of course, being around agriculture my whole life and kind of, like, a lightbulb went off, and I was, like, "Ohh, ag teacher it is"!

Imogene fell into the first group as well saying, "Probably when I was in high school and I was teaching those younger kids. Even though it was horseback riding, I knew in that moment I definitely wanted to be a teacher." She brought back to life a moment when a little girl was scared to go over a jump by herself after she had previously fallen off. Imogene told her she would lead the horse over the jump on foot to help regain her confidence. “In that moment, her face just brightened up, she smiled, and her eyes got really big, and she said, “Okay, I think I can do it”…and I didn’t think what I did was all that important, but, to her, it changed the day, changed her whole mood.”

Those participants who re-counted deciding to teach during their senior year, coupled that moment with a big event, mostly within FFA or agricultural education. Some of these culminating events were “my high school graduation” (Becky), “applying to college” (Louise), “whenever I got my goats [for my senior year]” (Olive), and “once it was all over [state contest for vet science], like, I realized, like, my time is done” (Felicia). Nathaniel recalled a quiet moment with his own agricultural science teacher, “Yeah, it was December of 2012. That was after we had gotten back from─it was after the State LDE Competition in [city] and, we were─I was talking to my ag teacher and I told her I wanted to be an ag teacher and she said, ‘If that’s what you want to do, I think you’ll be great at it, and you should go for it.’”

Some of those events were not always positive, however. Devon visualized the time he had won with his goats at the [city] stock show:

> And I look around and my ag teachers were nowhere to be found. And instead it was my extension agent, the extension agent from two counties away, their running buddy, my uncle which [sic] was an ag teacher at another school in the same district, my parents, and a guy with 4-H Quality Counts…and my ag teachers, instead, were at the lamb and sheep deal watching a kid get, like, fifth. That’s probably when I decided I wanted to be an ag teacher because I didn’t want to be not, like─I guess just absent, especially when there is

two of them [agricultural science teachers], for neither of them to be there. So I guess to always want to be there for somebody and to never let anybody feel left out" (Devon).

Andie had a similar experience recalled being at a livestock show as well "…and the ag teacher didn't really care about everyone that needed help at the show. In that moment, I knew I wanted to be an ag teacher and to always be there for my students."

College

Seven of the 20 participants responded that they made the decision to teach while in college. Similar to the *High School* theme, this group was easily split into two sub groups: those that decided in early college (4) and those who decided closer to the completion of college (3). Carmen vividly described the day early in her college career that she decided she wanted to enter a career of agricultural education:

> So, it was probably about two months into my freshman year of college. We were actually all sitting at the dinner table in the, like, in our dining hall facility…and they weren't friends of mine, they were acquaintances and friends of a friend, but we were all sitting there and they were talking about what it was that they were doing and one of their classes and that, you know, they were going to be able to do this one day with their own classroom and they were going to be able to tell their kids about this and the experience they had and… I was sitting there and I was listening and I was excited for them and I thought that was so cool and then I realized that I was extremely jealous of the thought that they were going to be able to do that and I wasn't going to be able to and that I wanted the same ability to share all of my stories and my passion and all the things that influenced me to make that decision to be an ag teacher and to be involved in ag in general."

Piper did not even have to process the question before she recounted her early college decision:

> Yes, freshman year of college, fall semester, like, in November, after I failed my third rangeland ecology exam because I could not get it. I said, ‘This is stupid. This isn’t even what I want to do.’ I joined the major because I got recruited to be on the Plant ID team, with [professor]. I said, ‘Okay, I’m going to do rangeland ecology,’ knowing in the back of my head, this isn’t all what I wanted. And I failed that test and went and sat in [graduate teaching assistant]’s 107 Animal Science class, watched her teach, after I failed that third test and said, ‘What am I doing? I’m supposed to be an ag teacher!’ I remember that very vividly.

Harrison’s decision moment fell into the latter stages of college:

> I don’t know if it was an exact moment, it might be a couple clusters of moments, but it was the success that I had in my mech [agricultural mechanics] classes with [professor] and I just thought I was average at that, honestly, I didn’t think I was anything good with [sic] it. And his excitement…and I realized how good I was at it, I realized that I could be a good asset for that.

Evan soaked in all of his college experiences before deciding to teach. His decision is one that is either a story of deep thought or procrastination; knowing him, I’m guessing the latter:

> Couple of moments…some of them came on the last day of our student teaching experience whenever some of those students that, you know, hang out after school, and stuff, and after classes, and just spend extra time with you, that you just get to just see so often and spend so much time with and become close to. Just to have those students that actually appreciate what you do for them and all the extra time you put in and they see

that and recognize that that's pretty cool and that was, like, that made me feel really nice (Evan).

A Gradual Decision

As may not be surprising, Ruth was the only participant that fit into this theme. It should be noted that Ruth was the only Q sort that loaded for Factor 3. For Ruth, it was a culmination of different experiences that have occurred over time:

> [Academic advisor] helped a lot, because I was so unsure and I even talked to him about switching majors…he helped me feel, like, stable [in agricultural science]… But it was just, like, all my classes, like, all of them leading up to this, leading up to student teaching because all of it was ag. But like all my ag classes…I enjoyed going to. So, I guess just over time I became more positive and sure about it [teaching agricultural science]. Ohh, and my dad! My dad influenced me because he was a truck driver and he drove [sic] dairy milk, so I thought that was cool, like, when I was a little kid, I thought that was cool! … and then he drove for an oil company, so I guess my family's, like, always been in ag! But again, like, I, like, I didn't realize what was in front of my face.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The purpose of this study was to develop an understanding of the beliefs and opinions Texas A&M University Agricultural Science students have about teaching as a career path. I intended to explore the impact of the components of the Agricultural Science Program on students' decision to teach as well as external motivators that have an influence on that decision.

Research Question One

In this group of Texas A&M University Agricultural Science students, three factors or viewpoints surfaced through the Q sorts and subsequent interviews: *Mindful, Methodical Mentors* (Factor 1), *Purposeful, Practical Planners* (Factor 2), and the *Collaborative, Cultural Cultivators* (Factor 3). The Q sorts for Andie, Evan, Imogene, Nathaniel, and Olive loaded significantly and were therefore flagged for Factor 1, the Mindful, Methodical Mentors. The Q sorts for Devon and Louise loaded significantly and were flagged for Factor 2, the Purposeful, Practical Planners. Finally, Ruth had the only Q sort that loaded significantly and was flagged for Factor 3, the Collaborative, Cultural Cultivators.

Each of the factors produced reliability coefficients of 0.80 that indicated that the three factor solution was reliable, as shown in Table 6. Additionally, the low intercorrelation values of each factor, displayed in Table 7, further supported the conclusion that this solution was valid and reliable. None of the intercorrelation values were close to the values of the factors loadings for sorts that defined any particular factor. It was concluded that the three factor solution and subsequent characterizations for each factor are accurate explanations of how Texas A&M University Agricultural Science students make their decision to teach.

Research Question Two and Three

While looking at the characteristics of each factor and individuals whose Q sort loaded for each factor, the viewpoints had to be viewed from a psychographic and a demographic perspective, simultaneously. The following combines the psychographics (Table 9, 10, and 11) and demographics (Table 12) of each Q sorts that loaded with each particular factor.

Conclusions for Factor 1

The Mindful, Methodical Mentors, was a viewpoint comprised from the perspective of two Hispanic females, one Hispanic male, one Caucasian female, and one Caucasian male. All of the participants who loaded for Factor 1 attended a large Class 6A Texas high school, with the exception of Evan who attended a Class 2A high school. Table 9 displays the distinguishing statements for Q sorts that loaded for Factor 1. Although the individual's demographics are important to achieve a holistic understanding of the Mindful, Methodical Mentors, emphasis was placed on the psychographics.

The fact that the positively valued statements in this viewpoint are all focused on the students shows that the main concern of the Mindful, Methodical Mentors is to impact students (Lawver, 2009; Lemons, Brashears, Burris, Meyers, & Price, 2015). Additionally, they desire to improve students' potential for personal growth, leadership, and future career success. The Mindful, Methodical Mentors hold an inborn fondness and passion for agriculture (Lemons, Brashears, Burris, Meyers, & Price, 2015) and delight in sharing that knowledge (Lemons, Brashears, Burris, Meyers, & Price, 2015; Reid & Caudwell, 1997; Lortie, 1977) and passion with the next generation (Lawver, 2009). They truly believe that being an agricultural science teacher is the best way they can contribute to society (Lawver, 2009; Hammond, 2002; Kyriacou & Coulthard, 2000; Lortie, 1977) by changing the misconceptions of agriculture (Lemons, Brashears, Burris, Meyers, & Price, 2015) and serving as a positive role model for their students (Park & Rudd, 2005). The Mindful Methodical Mentors enjoy spending time with students (Lemons, Brashears, Burris, Meyers, & Price, 2015; Park & Rudd, 2005) and strive to build a complete program as opposed to a class (Park & Rudd, 2005).

This is the viewpoint that I noticed emerging about halfway through the study and I was not surprised that it accounted for a great percentage of the variance.

Conclusions for Factor 2

The Purposeful, Practical Planners was a viewpoint comprised from the perspectives of one Caucasian female who attended a large Class 6A Texas high school and one Caucasian male who attended a smaller 3A high school. Table 10 shows the distinguishing statements for the Purposeful, Practical Planners. Again, more emphasis was placed on the psychographics of the individuals to create a more holistic viewpoint.

The positively valued statements for this viewpoint revolve around student teaching and planning for a future family. Drawing on the student teaching experience (Lemons, Brashears, Burris, Meyers, & Price, 2015) the Purposeful, Practical Planners feel better equipped to make the decision to teach. This contradicted Roberts, Harlin, and Briers (2009) who stated that "the student teaching experience did not change the intentions on whether to enter teaching; this decision had been determined prior to student teaching, with student teaching merely confirming their decision." In contrast, Louise bluntly said, "If I absolutely hate it [teaching agricultural science] in May, I guess I'm going to look for something else to do."

Planning for a family is also at the forefront of this Purposeful, Practical Planners mind. They chose teaching agricultural science as it will allow time for family and it fits well with family responsibilities (Richardson & Watt, 2006). This is contrary to Rocca and Washburn

(2008) as they identified responsibilities to family and desire to live in a certain area as barriers to entering the career of teaching agricultural science and Lawver (2009) who had participants indicated they were not sure if "agriculture teachers have time to devote to their personal life" (p. 113). The Purposeful, Practical Planners perceive that teaching agricultural science will allow them to live where they wish. However, since the perspectives that make up this viewpoint have not actually entered the field of teaching, perhaps they are not aware of the actual time demands that are placed on agricultural science teachers. The emergence of this viewpoint was surprising as most people believe that it is impossible to be both an agricultural science teacher and a parent. Yet, the reasoning of this viewpoint is completely opposite of that. They chose a career in teaching agricultural science for the purpose of integrating it into their family life. It is my concern that the Purposeful, Practical Planners who perceive they have summers off may have unrealistic expectations about vacation days and time off that agricultural science teachers receive.

Conclusions for Factor 3

The Collaborative, Cultural Cultivators viewpoint was comprised of the perspective of a sole African American female who attended a large Class 6A Texas high school. Table 11 shows the distinguishing statements for Ruth and, once more, emphasis was placed on the psychographics of the individual to create a more holistic viewpoint.

The positively valued statements for the Collaborative, Cultural Cultivators are centered around the individual's previous agricultural work experience (Edwards & Briers, 2001; Kasperbauer & Roberts, 2007), the individual's high school agricultural science teacher (Rocca & Washburn, 2008) and her ethnicity. This was in contrast to Roberts, Greiman, Murphy, Ricketts, and Harlin (2009) as they found there was no relationship between intent to teach and agricultural work experience and decision to teach, and Rocca and Washburn (2008) who found that ethnic discrimination was perceived as a slightly likely barrier to entering the field of teaching. Prior work and learning experiences, positive and negative, were the most influential. The emergence of this viewpoint was also surprising, as it contradicts the most recent literature. Additionally, as there was only one African American student in the P-set for this study, it is difficult to infer how much emphasis should be placed on ethnicity in regards to the decision to teach agricultural science.

Across the three viewpoints, teaching agricultural science was not a fallback career for these pre-service teachers, which supports Lawver's (2009) findings of students that were "confident about their choice of career and did not choose teaching secondary agricultural science as a fallback career" (p. 123). Age was little importance for these three viewpoints in their decision to teach (Roberts, Greiman, Murphy, Ricketts, & Harlin, 2009). All these viewpoints mentioned having friends who were supportive of their decision to teach, but they also recognized those friends were not an influential factor which was in contrast to Lawver's (2009), Esters and Bowen's (2005) and Reid and Caudwell's (1997) findings. Finally, most of the participants laughed when they looked at the statement "Ag teachers are well paid." All viewpoints realized that teaching agricultural science is not going to make them millions, but they all admitted that they are not interested in teaching for the monetary value. This is quite the opposite of what Lawver (2009), Harms and Knobloch (2005), and Manuel and Hughes (2006) found. All three studies stated that earning a good salary was a deciding factor to become a teacher.

Ajzen (1991) describes three forces at work within the Theory of Planned Behavior: attitude, subjective norms, and perceived behavioral control. These three inputs feed off one another and simultaneously into intention, which then feeds into the behavior. Operationalized with the findings of this study, each of the three viewpoints matched the three initial inputs in the model. Attitude is characterized by the Mindful, Methodical Mentors viewpoint. Their enjoyment in sharing their own knowledge and passion for agriculture is apparent and is evidence of a positive attitude towards teaching agricultural science. Subjective norms are characterized by the Collaborative, Cultural Cultivators viewpoint. They highly value the opinions of those around them, especially their high school agricultural science teachers. They also have contemplated other people's view of their ethnicity in the role as an agricultural science teacher. Perceived behavioral control is characterized by the Purposeful, Practical Planners viewpoint. When factoring in building a family, they have already thought about how difficult a career as an agricultural science teacher would be. They are planning to integrate their family life into their job so they can overcome those difficulties to being an agricultural science teacher. Figure 4 shows a proposed model of the viewpoints that emerged and how they fit into Ajzen's (1991) Theory of Planned Behavior. Positive attitudes about teaching agricultural science, support from key people around them, and a plan for overcoming the perceived difficulties involved in being an agricultural science teacher were found to be related to one another and lead to a strong intention within the confines of this study. As Ajzen stated, "the stronger the intention to engage in the behavior" (p. 181), the more likely the behavior will occur.

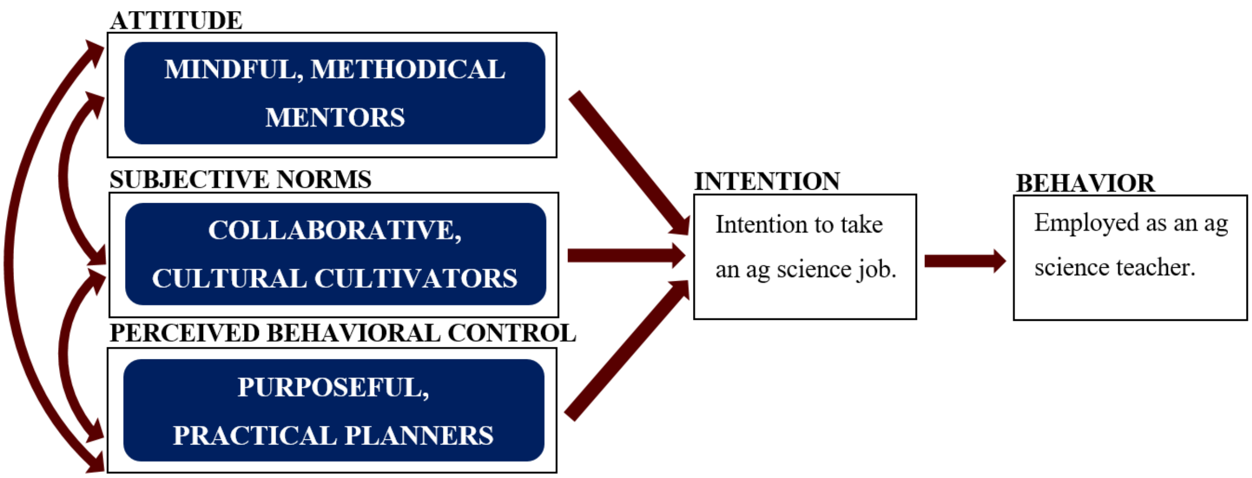

Figure 4: A combined model of the Theory of Planned Behavior and emergent viewpoints.

Research Question Four

In this group of 20 pre-service teachers, 12 reported making the decision to teach while still in high school, seven made the decision to teach during their college experience, and one described her decision to teach as a compilation of all the experiences she had up to this point. 18 of the 20 could pinpoint the exact place and time they decided to teach agricultural science, evidence that the decision to teach happens in high school or early college. This relates back to teaching never being a fallback career for these students (Lawver, 2009). Once these participants found teaching agricultural science as an option, they stuck with that decision.

Recommendations

Research

As this study was specific to the Texas A&M University Agricultural Science students, it is not generalizable to other people, but is generalizable from the Q-set back to the concourse for this study. That being said, replications of this study are highly recommended, with various universities and various groups of student teachers to determine if the same types of viewpoints emerge. A longitudinal study following the participants of this study would be also be interesting to see if 1) they actually chose teaching agricultural science as a career and 2) why they chose to remain in the profession if they were still teaching after five or ten years.

If this study were to be replicated, I recommend that all participants have completed the student teaching experience and have a more complete view of all the different stages that take place towards becoming an agricultural science teacher. The majority of the participants in this study had only had a few weeks of student teaching experience and their responses may have changed following the completion of this high impact experience. It is also recommended that the researcher build a relationship with the participants prior to carrying out the Q sorts. Some of the stories I was told would have almost certainly been withheld, had I not known the participants before they agreed to contribute to this study.

A nationwide, holistic view of the decision to teach agricultural science using Q Methodology is suggested before venturing back to quantitative methods and looking microscopically at solving the teacher shortage problem.

More research is need in the realm of decision to teach agricultural science. Students graduating college with a degree in agricultural education need to be asked when they made the decision to teach so recruiting efforts can be more concentrated to that age group or time period. Even though the participants I identified possessed a strong desire to teach after graduation, there were some who graduated in December and were not employed in a teaching position at the completion of this study in March. It was unclear if that was because they did not want to start at a position in the middle of the year, they received a different opportunity, or had changed their mind and do not want to teach.

Practice

Universities, specifically Texas A&M University may take advantage of this research to effectively identify those individuals interested in a teaching profession earlier in their academic career. University faculty may also use this research to improve the agricultural science programs to help emphasize the positive components and help steer agricultural science teachers around those perceived barriers and challenges.

I realize that faculty already have full schedules, but it is recommended that they spend more time with pre-service teachers, prior to sending them out to the student teaching experience. This quality time could include conversations that are vital to the student's decision to teach. These conversations could very easily indicate which of the three groups a student favors and what actions need to be taken to promote teaching as a career option in that student's mind. Those specific actions look different for each of the three factors that were found in this study, but, in general, the option to teach agricultural science needs to be an ever present career option. Agricultural science teachers currently out in the field should speak of teaching as a viable possibility starting as early as sixth or seventh grade. University faculty in all departments, not just Agricultural Science, should also present teaching agricultural science as a career option in lower level classes, while students are sometimes still undecided about a career path. Speaking of our careers in a positive light to everyone we meet is critical, as we never know who may be listening and how our words impact them. Regardless of age, ethnicity, gender, or background in agriculture, young people should be well informed about what teaching agricultural science involves, and that it is a possible and worthwhile career option.

Students who place their own future students at the forefront of their priority list are similar to the Mindful, Methodical Mentors. It is recommended that these students be presented with opportunities that allow them to teach at a very early stage in their education. This may be a responsibility that falls primarily to the high school agricultural science teacher. That opportunity can be informal, such as assisting younger students in the agricultural mechanics lab, or formal, such as presenting an Ag in the Classroom lesson to elementary students during National FFA Week. Some students have a natural inclination to teaching, and those tendencies and skills need to be identified early to foster further development. During the years prior to student teaching, those in the Agricultural Science program need to continue to have available chances to teach others. This allows students to practice building those relationships early so they can experience being a mentor.

For students who are more like the Purposeful, Practical Planners, and actually have two goals in mind, teaching and having a family, the interactions should look differently. At all stages of agricultural education, high school agricultural science teachers, teacher educators, and cooperating teachers should be upfront with students about incorporating a family life while still portraying the teaching profession in a positive light. Experienced teachers often make it seem easy to balance work and family, but it is necessary to share with unseasoned teachers that achieving that balance also takes practice. Students that tend towards this viewpoint need visible, practical examples that reveal how to teach while still having a family. Students like these should be placed with a cooperating teacher who can successfully demonstrate this balance, in order to further confirm their decision to teach.

Continuing to recruit students is vital for the success of our programs. Recruitment needs to be happening at the secondary level to get young students generally interested in agriculture and, at the college level, to inform students about teaching agricultural science as a career option.

Finally, a few of the participants in this study said that the process of Q sort was beneficial because it allowed them to consider all the possible reasons to teach at one time. Some participants mentioned that while they had considered some of the statements in the Q set, but had not thought about all the reasons that contributed to their decision to teach. It is highly recommended that a Q sort, like the one utilized in this study, be used as a reflection tool for pre-service teachers before and after student teaching. Before student teaching, a Q sort would be helpful for faculty to better understand a student's goals and may assist in placing the student under the most appropriate cooperating teacher. After student teaching, a Q sort allows students to critically examine their coursework, student teaching experience, and any other reasons they feel are important when deciding to teach. I believe that these students, especially the five who had completed student teaching, learned a good deal about themselves and reasons they considered when deciding to teach. Reflection is invaluable after the student teaching experience and is, ultimately, the place where learning and growing takes place.

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APPENDIX A

RECRUITMENT EMAIL

Howdy!

My name is Jenna Gilbert and I am a graduate student working under Dr. Tim Murphy at Texas A&M University. You are receiving this letter as you are an undergraduate in the Agricultural Science Program and have expressed a strong interest in a teaching career after college. I am conducting research on agricultural science students' decision to teach and am emailing to ask if you would like to be a part of my research. Participation is completely voluntary and involves sorting some statements and answering questions about your decisions.

If you are interest in being involved, please reply to this email or stop by my office, AGLS 246.

If you have any questions, please feel free to email me at jennarae@tamu.edu or stop by my office, AGLS 246.

Thank you for your time!

Jenna Gilbert

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AGRICULTURAL LEADERSHIP EDUCATION & COMMUNICATIONS
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APPENDIX B

RECRUITMENT SCRIPT

Introduction

Excuse me, [student's name]. Do you have minute? My name is Jenna Gilbert. I am a graduate student in the Agricultural Leadership, Education, and Communication Department and I am doing my thesis research under Dr. Murphy.

You received an email from me about a study about undergraduates' decision to teach. I am wanting to follow up with that email and see if you are interesting in hearing more about our study. (Give them the chance to say no if they do not want to participate in the study.)

(If yes.) You were selected to be a part of this study because you are an Agricultural Science student and you have expressed a strong interest in teaching at the high school level after finishing college. I am curious about how you came to that decision and would like to tell that part of your story. Are you interested in hearing more details? (Again, give them the chance to say no.)

(If they are interested, give them a short summary of what would be required of them and possibly set up a time for Q sort.)

APPENDIX C

CONSENT INFORMATION SHEET

Project Title: Decision to Teach: A Q sort with Texas A&M University Agricultural Science Students

You are invited to take part in a research study being conducted by Jenna Gilbert, a researcher from Texas A&M University. The information in this form is provided to help you decide whether or not to take part. If you decide to take part in the study, your consent will be acknowledging and agreeing to everything on this information sheet. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefits you normally would have.

Why Is This Study Being Done?

The purpose of this study is to investigate the thoughts, beliefs, and opinions Texas A&M University Agricultural Science students have about deciding to teach.

Why Am I Being Asked To Be In This Study?

You are being asked to be in this study because you are enrolled as a preservice teacher in the Texas A&M University Agricultural Science program and have expressed a strong interesting in a teaching career.

What Are the Alternatives to being in this study?

The alternative to being in the study is not to participate.

What Will I Be Asked To Do In This Study?

You will be asked to sort statements regarding your decision to teach and you will be asked some follow-up questions about your decisions in sorting those statements. This process will take approximately 30-90 minutes.

Are There Any Risks To Me?

The things that you will be doing have no more risks than what you would come across in everyday life.

Will There Be Any Costs To Me?

Aside from your time, there are no costs for taking part in the study.

Will I Be Paid To Be In This Study?

You will not be paid for being in this study.

Will Information From This Study Be Kept Private?
No direct personal identifiers will be collected for this research. The records of this study will be kept private. Research records will be stored securely and only the Principal Investigator and the research team will have access to the records. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Subjects Protection Program may access the records to make sure the study is being run correctly and that information is collected properly.

Will Photos, Video or Audio Recordings Be Made Of Me during the Study?
The researchers will make an audio recording during the study so that they can check their notes for credibility and accuracy. If you do not want to be recorded, you may decline to participate in the study.

Who may I Contact for More Information?
You may contact the Principal Investigator, Jenna Gilbert, to tell her about a concern or complaint about this research at 575-447-5362 or jennarae@exchange.tamu.edu. You may also contact the Graduate Chair, Dr. Timothy Murphy at 979-862-3419 or tmurphy@tamu.edu. You may also contact the Protocol Director, Dr. Tobin Redwine at 979-458-7993 or tredwine@tamu.edu.

What if I Change My Mind About Participating?
This research is voluntary and you have the choice whether or not to be in this research study. You may decide to not begin or to stop participating at any time. If you choose not to be in this study or stop being in the study, there will be no effect on your relationship with Texas A&M University.

By consenting to be in this study, you are agreeing that you understand what is being asked of you and have had any questions answered prior to your participation. You are also giving your consent to be audio recorded.

APPENDIX D

CORRELATION COEFFICIENTS FROM PQMETHOD

	Participant																			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
Q1	100																			
Q2	48	100																		
Q3	32	65	100																	
Q4	21	24	37	100																
Q5	53	49	63	32	100															
Q6	37	57	59	52	46	100														
Q7	32	67	72	42	63	54	100													
Q8	47	49	62	39	61	50	53	100												
Q9	58	64	71	34	80	63	74	64	100											
Q10	59	65	68	47	70	69	70	68	82	100										
Q11	55	61	66	51	53	63	64	66	69	83	100									
Q12	23	42	46	45	8	56	42	38	32	47	47	100								
Q13	42	52	63	31	52	50	56	64	61	70	64	44	100							
Q14	41	45	46	23	44	52	55	69	51	58	54	39	54	100						
Q15	61	65	64	35	65	64	54	55	73	69	69	37	60	49	100					
Q16	47	57	56	45	41	59	50	61	52	74	71	38	64	51	52	100				
Q17	37	39	41	0	28	23	26	43	24	30	32	18	42	22	30	42	100			
Q18	47	73	72	42	50	75	60	55	67	70	66	45	65	53	69	63	28	100		
Q19	49	46	48	39	41	49	52	53	50	68	61	49	52	33	46	56	23	53	100	
Q20	32	55	61	45	34	58	62	49	52	64	57	58	52	39	46	64	43	60	49	100

APPENDIX E

FACTOR ARRAY FOR FACTOR 1

						44						
					45	23	20					
				34	43	10	41	32				
		7	1	46	52	30	21	28	38	16		
	6	36	11	5	8	22	51	31	15	17	18	
	48	49	53	42	50	39	27	29	14	4	19	
47	12	2	35	37	24	25	33	13	26	9	10	3
-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6

←Least Important ——— Most Important→

APPENDIX F

FACTOR ARRAY FOR FACTOR 2

						34						
					44	50	8					
				52	46	16	26	27				
		2	6	51	9	17	28	4	29	23		
	1	36	37	31	5	10	45	39	53	24	21	
	33	48	7	42	19	41	13	20	3	12	22	
47	32	49	43	14	35	40	18	38	15	25	30	11
-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6

←Least Important ——— Most Important→

APPENDIX G

FACTOR ARRAY FOR FACTOR 3

						45						
					51	14	17					
				52	44	42	43	46				
		6	53	50	16	4	38	41	49	39		
	37	12	7	15	9	2	29	23	48	27	40	
	34	11	47	30	10	1	26	22	33	25	24	
35	36	5	8	28	31	3	18	19	13	20	21	32
-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6

←Least Important ——— Most Important→