AN ANALYSIS OF CURRENT AND FORMER MATHEMATICS AND SCIENCE

TEACHER EDUCATION PROGRAM PARTICIPANTS' PERCEPTIONS FOR

QUALITY ASSURANCE

A Dissertation

by

OMAH MAKEBBE WILLIAMS-DUNCAN

Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Chair of Committee,   Hersh Waxman
Co-Chair of Committee,   Tim Scott
Committee Members,   Valerie Hill-Jackson
                         Chance Lewis
                         Cathleen Loving
Head of Department,   Yeping Li

May 2015

Major Subject: Curriculum and Instruction

ABSTRACT

State curriculum and professional standards characterize the level of proficiency pre-service teachers must attain to be prepared to teach in Texas classrooms. Teacher education programs are being scrutinized for their ability to help pre-service teachers reach a level of proficiency commensurate with these state standards. This dissertation presents an understanding of a teacher education program's quality via analysis of its current student teacher and former student perceptions.

There are two participant groups in this study - current student teachers (n=11) and former students (n=78) from one program called, aggieTEACH, a traditional baccalaureate secondary mathematics and science teacher education program. Of the current student teachers and former students participating in this study, 77.5% (n = 69) were female, 21.3% (n = 19) were male and 1.1% (n = 1) did not disclose their gender; additionally, 80.9% (n = 72) identify as white or Caucasian, 9% (n = 8) identify as Hispanic, 7.8% (n = 7) identifying as African American, Asian, or other, and 2.2% (n = 2) decided not to disclose their race.

This mixed methods study reveals participant's agreement and confidence levels in mentoring, confidence, TEP quality, and program characteristics of aggieTEACH. The researcher used principal components analysis, exploratory factor analysis, and content analysis to review secondary data from administered web-based surveys. The surveys have Likert-scaled, single-response items and open-ended response items. Specific survey items were identified per categories called (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics. The mentoring scale yielded an alpha of .903. The confidence subscale yielded an alpha .951. The quality items yielded an alpha .881 and the

characteristics items yielded an alpha of .919. Significant differences occurred between current student teacher and former student participants' agreement and confidence levels about the teacher education program characteristics and experiences. Current student teachers scored higher on average and have less variability to former students on (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics scales. Lastly, both current student teachers and former students identified student teaching and field observations as the most helpful or relevant component of their teacher education program experiences.

DEDICATION

This dissertation is dedicated to all brown-faced girls who think they can or can't finish their race. They have someone, anyone, who believes more in them than they may believe in themselves. This work is also dedicated to my unborn daughter of many names, my mother, grandmothers, aunts, cousins, sister-friends, mentors, and teachers. If I can, you can finish your journey…one step, word, practice session, at a time.

ACKNOWLEDGEMENTS

The completion of this dissertation would not have been possible without the supernatural guidance of God, who granted me coverage, mercy, and grace throughout this journey. I am also thankful for my parents, Willie Moses Williams and Jacqueline Williams, and my husband, Herbert Ronzy Duncan, II, for their encouragement and unwavering support. Lastly, thanks and appreciation to my committee chairs, Dr. Hersh Waxman and Dr. Timothy Scott, along with my committee members, Dr. Valerie Hill-Jackson, Dr. Chance Lewis, and Dr. Cathleen Loving, for their advice, comments, and participation throughout the course of this research.

I am reminded that my former teachers, graduate school friends and colleagues, and mentors provided bits of inspiration, help and advice along this journey – in short, I finished because they recognized my potential and poured knowledge into me. Hence, gratitude is given to my former grade school teachers, Mrs. Rosemary Gagne, Mr. Termuhlen, Mr. May, Mr. Robert Banks, and Mr. Garrett and my undergraduate professors and mentors, Dr. Etta Falconer, Dr. Cornelia Gillyard, Dr. Johnetta B. Cole, and Dr. Reba Williams-White, Nedaro Bellamy, and Freda Marks Lockhart-Perkins. Additionally, I am especially grateful for my sisters in academia who inspired and finished their degrees before me. Their perseverance did not go unnoticed and I am grateful for their example. They are as follows: Dr. Sonia Houston, Dr. Lalisa, Anderson, Dr. Rhondee Johnson, Dr. Regina (Davis) Wells, Dr. Theresa (Hackney) Spiller, Dr. Bettie Ray Butler, Dr. Olivia McGill, Dr. Robbyn Richardson, Dr. Leslie Ann Brown, Jamila Brewer, Effie (Lori) Gooch, Dr. Lisa Henderson Hubbard, Dr. Ayanna Allen, Dr. Carolyn Evans - Shabazz, Dr. Mary Odom, Dr. Allison Bashir, Dr. Sara

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

A teacher education program (TEP) such as aggieTEACH trains individuals to teach in K-12 classroom settings. The aggieTEACH program, which provides the setting for this dissertation research, is a traditional, early field placement, baccalaureate program within two departments of Texas A&M University – the Teaching Learning and Culture department of the College of Education and Human Development and the Center for Mathematics and Science Education of the College of Science. Like many TEPs, aggieTEACH along with others across the nation are being scrutinized for quality practices and graduates. Community members such as business leaders, education researchers, and politicians examine TEPs and their available data, attempting to connect program quality and effectiveness with teacher quality and K – 12 student achievement on national and state standardized tests (National Council on Teacher Quality, 2011a; National Council on Teacher Quality, 2011b). Additionally, community members sometimes discuss TEP quality as a function of teacher certification rates – these members want to influence teacher education program policy to increase quality teacher numbers (National Research Council, 2010; Cochran-Smith, 2005a). The actions of these same individuals influence education research, which also impact accrediting agency standards. Accrediting agency standards sanction education program activity. Such standards cannot control for variances in teacher education program quality because there are divergent pathways in teacher preparation. In the next section, effects of teacher preparation's divergent pathways are presented.

Teacher Preparation

Divergent teacher certification pathways are varying routes to teacher certification that occur in TEPs (Boyd et al., 2008). Baccalaureate and post-baccalaureate TEPs provide two certification pathway categories for teacher preparation. Outcomes of divergent teacher certification pathways are increased teacher certification rates (Cochran-Smith & Fries, 2005a; National Research Council, 2010) and rationale for instituting accreditation standards to insure TEP quality (Fraser, 2007). Baccalaureate education programs require completion of education courses and certification while obtaining an undergraduate degree. Post-baccalaureate education programs require completion of education courses and certification after obtaining an undergraduate degree. These pathways produce varied amounts of teachers who go into varied K-12 classroom settings. Common to both of these pathways is development of (a) K-12 teacher confidence, (b) teacher perceptions of programmatic quality, and (c) teacher education program quality. The following sections describe each of these factors that could potentially be used to assess teacher education programs (TEPs).

Teacher Confidence

Teacher confidence is personal belief in the ability to successfully complete an objective in an education setting (Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998). When teachers are trained in their baccalaureate or post-baccalaureate programs, they develop confidence in delivering academic content knowledge and implementing instructional strategies (Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998; Ure, 2010) – they rely on their training in education settings to get desirable results. Teacher confidence is measureable, developed overtime, and occurs at varied levels after experiencing TEP training (Kerr, 2006; Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998; Zeichner, 2007). While the beginning of

confidence may be difficult to pinpoint, TEP participants may self-assess their confidence. TEP participants may also combine measures of their self-assessed confidence with overall perceptions of TEP characteristics to help determine TEP quality. I introduce teacher perceptions in the next section.

Teacher Perceptions

Perception is insight, observation, judgment, and opinion about experiences or ideas. Teacher education program participants hold perceptions about their TEP after completing or implementing program requirements (Champion, 2010; Kerr, 2006; Zeichner, 2007). Their perceptions about their TEP facilitated experiences and gained instructional skills and academic content knowledge mold their belief about TEP quality (Champion, 2010). Like confidence, perceptions are measureable, developed overtime, and occur at varied levels (Champion, 2010; Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998). Perceptions by education program participants can be helpful in describing a teacher preparation program's quality. These descriptions may also provide insight to confidence about knowledge and skills.

Teacher Education Program (TEP) Quality

Quality of TEPs may be described by teacher confidence and teacher perceptions of program practices (Mukhopadhyay, 2014). Program practices are prescribed daily occurrences and experiences within a TEP. As previously mentioned, TEP quality has often been determined by teacher certification rates and achievement of K-12 students on national and state achievement tests (Mukhopadhyay, 2014; National Council on Teacher Quality, 2011a; National Council on Teacher Quality, 2011b). However, TEP quality is more complex than teacher certification rates and K-12 student achievement on national and

international exams (Mukhopadhyay, 2014). Teacher confidence and perceptions are

associated with teachers' account of TEP effects (Burstein, Czech, Kretschmer, Lombardi, &

Smith, 2009; Kerr, 2006; Thomas & Loadman, 2001; Tschannen-Moran, Woolfolk - Hoy, &

Hoy, 1998). Additionally, TEP quality relates to standards set forth by accrediting agencies.

Adherence to accrediting agency standards define TEP efficacy, the ability of the program to

prepare teachers that can do what the program intends (or teaches) (Hammrich, 1998;

Metzler & Tjeerdsma - Blankenship, 2008).

Purpose of This Study

The purpose of this dissertation is to present an understanding of teacher education

program quality via current and former student teacher perceptions. Specifically, this mixed

methods study investigates current and former student teachers' perceptions of mentoring,

confidence, TEP quality, and program characteristics for TEP quality assurance. Current and

former student teachers' perceptions of TEP program characteristics are utilized as variables.

The participants in the study come from a traditional baccalaureate education program called

the aggieTEACH Mathematics and Science Secondary Teacher Certification program

(hereafter called, aggieTEACH). Information about varied teacher preparation pathways and

measurement of confidence and perceptions from program participants are vital components

in this study. Hence, the next section provides more information on these four topics: teacher

education program (TEP) quality, teacher preparation, teacher confidence, and teacher

perceptions.

Teacher Education Program (TEP) Quality

Current state of teacher education program quality. Currently, teacher education

program quality is highly politicized (Cochran-Smith & Fries, 2005a; National Research

Council, 2010). For example, critics impact education program quality by debating how these programs influence teacher knowledge. Additionally, educational researchers provide divergent conclusions about teacher knowledge, which in turn influence education programs (Cochran-Smith & Fries, 2005a). Lastly, accrediting standards shape the landscape of education program quality by providing minimum requirements that are used by some researchers to determine teacher education program quality.

Teacher Education Program Accreditation

Teacher education program accrediting agencies. While states often create and set accreditation standards for teacher education programs, there are two national accrediting agencies: Teacher Education Accreditation Council (TEAC) and National Council for Accreditation of Teacher Education (NCATE) (National Research Council, 2010). These agencies combined in 2010 to become the Council for the Accreditation of Educator Preparation (CAEP). The council provides minimum standards for teacher education program requirements and evaluation. Currently, teacher education programs may voluntarily become accredited by a national organization (e.g. CAEP) or by fulfilling state requirements (Fraser, 2007). Some state's requirements mirror the standards of the national agencies; other states have created their own standards (National Research Council, 2010). No matter the origin of accrediting standards, the accrediting requirements for state teacher education programs may require a certain program structure (e.g., course sequences and experiences) as certification of a graduates' minimal knowledge and skill level (National Research Council, 2010).

Power of accrediting agencies. Accreditation standards provide minimum standards for describing education program quality by delineating program structure and expectations

for participants (National Research Council, 2010). Fulfillment of accreditation standards by teacher education programs acts as public proxy for program quality (Berliner, 2000; Cochran-Smith, 2005; Cochran-Smith & Fries, 2005b; National Research Council, 2010). With two major categories of education programs and several pathways to certification, accrediting standards apply to both baccalaureate and post- baccalaureate programs (Boyd et al., 2008; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009). It is because of accreditation that participants of either program are able to pursue teacher certification via similar course sequences and experiences.

Teacher Preparation

Preparation programs and pathways. The NRC (2010) identifies two major program types for teacher preparation: traditional and alternative. Traditional teacher education programs prepare teachers during undergraduate matriculation or after receiving an undergraduate degree. Alternative teacher education programs, however, occur during post-baccalaureate education pathways (see Figure 1). The NRC (2010) describes "programs" as the specific courses and experiences provided by a particular program type and "pathways" as routes to teacher education, certification and licensure. Colleges and universities offer traditional and alternative programs. For-profit and non- profit groups (e.g. education service centers), in addition to institutions of higher education (e.g. community colleges, colleges, and universities), also offer alternative programs. In this study, teacher preparation occurs as participants experience the aggieTEACH program in the traditional, baccalaureate setting within the Teaching Learning and Culture department of Texas A&M University's College of Education and Human Development.

6
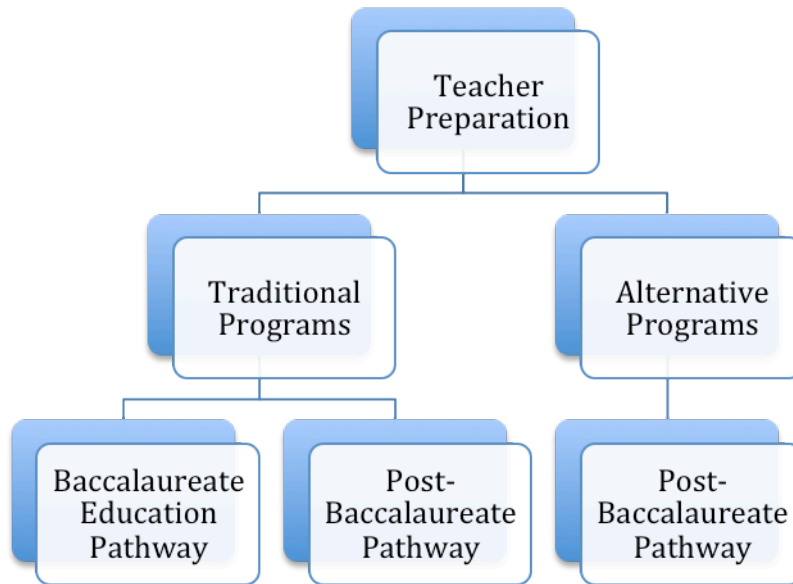
Figure 1: Teacher preparation as described by programs and pathways.

Participants of aggieTEACH obtain a baccalaureate degree in conjunction with teacher certification. In doing so, these participants major in an academic content area and fulfill state educator certification requirements by completing education course sequences and experiences (Scott, Milam, Stuessy, Blount, & Bentz, 2006). The aggieTEACH program facilitates courses and experiences (see Chapter 3 Methods for specific detail) that impart knowledge and skills related to participant confidence and perceptions. Hence, the developed influences of these program courses and experiences on participants potentially describe aggieTEACH's quality.

Teacher Confidence

Participants of aggieTEACH develop ideas about learned knowledge and skills while completing the program—these ideas may be confidence in academic content knowledge and instructional skills. The participants in this study self-assess their confidence. While the participant types are current student teachers, and former students, the practice of analyzing and comparing these participants' confidence contributes to an understanding of

aggieTEACH program quality. Additionally, teacher perceptions contribute to an understanding of quality.

Teacher Perceptions

Just as participants of aggieTEACH develop confidence about learned knowledge and skills while completing the program, they also develop perceptions about the program; therefore, participants self-assess their perceptions in conjunction with their confidence. This suggests that the practice of analyzing and comparing these participants' confidence and perception assesses aggieTEACH program quality. As previously mentioned, the stated purpose of this study is to present an understanding of teacher education program quality via current and former student teacher assessed perceptions and confidence levels — utilizing such described self-assessed confidence and perceptions may lead to an understanding and description of aggieTEACH quality.

The next section introduces historical contexts of this study. Research that is later detailed in Chapter 2, the literature review, follows historical contexts, which are information about the primary project this study is situated in. Supporting research follows. Overall, the section called, Background of the Study, includes major sections entitled: context of the study, and historical assessment of teacher education program quality, teacher preparation, program participants' confidence, and program participants' perception.

Background of the Study

This study occurs because of the Texas P-16 Action Plan, an initiative by the Texas Higher Education Coordinating Board to cultivate and ensure a college going culture for all P-12 students. A portion of the Action Plan requires preparation of education professionals in public and higher education to assist P-16 students in meeting Texas College and Career

Readiness Standards (Education Research Center, 2012). These standards are newly adopted secondary academic content objectives that encourage content knowledge and skills necessary for successful matriculation in introductory college courses or career fields (Texas Higher Education Coordinating Board, 2009). The Education Research Center at Texas A&M University (TAMU) addressed the Action Plan by creating the TAMU Educator Preparation Collaborative Project, a cooperative group of faculty, institutions of higher education, and local school districts. This group has pledged commitment to the TAMU Educator Preparation Collaborative Project components.

Context of the Study

TAMU Educator Preparation Collaborative Project components. Within the educator preparation collaborative project, there are five components. The components are as follows: (a) CCRS Awareness Package, (b) Online Self-Assessment Tool, (c) Video Case Study, (d) Social Networking, and (e) Research and Evaluation. This study only features the online self-assessment tool; all other TAMU Educator Collaborative Project components are beyond the scope of this study.

Collaborative rationale for self-assessment tool use. The TAMU Educator Preparation Collaborative Project anticipates that the online self-assessment tool to be implemented by other teacher education programs. The purpose of the self-assessment tool is to describe quality preparation of P – 16 education professionals to assist students in meeting Texas College and Career Readiness Standards (Education Research Center, 2012). Data from the on-line self-assessment tool describes teacher education program participants' confidence in instructional skills and perceptions of the program (Education Research Center, 2012). The aggieTEACH program, along with other TAMU programs, was selected as an

9

implementation site for the on-line self-assessment tool to determine the tool's usefulness. Data from aggieTEACH participants who self-assessed their confidence and perceptions are the focus of this study. Discussion of historical assessments of teacher education program quality, teacher preparation, and teacher education program participant confidence and perception provide foundational research for this study.

Historical Assessment of Teacher Education Program Quality

Internal and/or external evaluators (e.g. education researchers) conduct research about teacher education program quality to determine programmatic strengths and weaknesses (Khan & Saeed, 2010; Zeichner & Conklin, 2005; Zeichner, 2006; Zeichner & Paige, 2008). Historically, such researchers assessed entire teacher education programs using a variety of methods. Their assessment methods and the number of differing programs and pathways explain conflicting outcomes in education research about teacher education program quality (Boyd et al., 2008; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Grossman, Hammerness, McDonald, & Ronfeldt, 2008; National Research Council, 2010). These conflicting outcomes also guide rationale for conducting more specialized assessments of teacher education program quality. Hence, there have been more studies about specialized programs or pathways in the last 20 years (e.g. science and/or mathematics teacher education programs) (Boyd et al., 2008; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Grossman, 1990). In chapter 2, a review of literature discusses methods and outcomes of previously completed research about science and/or mathematics teacher education programs. More detail will be provided in the chapter, along with discussions about teacher preparation, differing pathways and programs toward teacher certification and licensure.

Historical Assessment of Teacher Preparation

Since the early 1990's, low numbers and retention of certified teachers have led to new teacher preparation pathways and programs (Cochran-Smith, 2004; Grossman & McDonald, 2008; National Research Council, 2010). Critics of teacher education programs advocated for variation in teacher preparation to increase numbers of certified teachers to meet demands in schools and in certain content areas. Subsequently, certification numbers were thought as proxies for quality teacher preparation. A review of literature presented in Chapter 2 highlights such studies, providing added connections to teacher confidence and perceptions.

Historical Assessment of Program Participants' Confidence

Some education researchers conduct research about teacher education program participant confidence. Specifically, they assess teacher confidence about academic content knowledge and instructional skills (Hill, Rowan, & Loewenberg-Ball, 2005; Loewenberg-Ball & Williamson-McDiarmid, 1989; Loewenberg-Ball, Thueule-Lubienski, & Spangler-Mewborn, 2001; Loewenberg-Ball, Thames, & Phelps, 2008). The research for teacher confidence is typically theoretical, delineating types of teacher knowledge described as subject matter knowledge (SMK) and pedagogical content knowledge (PCK) (Shulman, 1986; Shulman, 2000); such studies been linked to academic content areas like science and mathematics (Committee on a New Biology for the 21st Century, 2009; Haefner, Friedrichsen, & Zembal - Saul, 2006; Marbach-Ad et al., 2007; Rieg & Wilson, 2009; L. K. Smith & Gess-Newsome, 2004; Tanner & Allen, 2006). SMK is academic content knowledge, while PCK is knowledge of instructional skills and practices (Darling-Hammond, Newton, & Wei, 2010; Shulman, 1986). Specific SMK and PCK studies are beyond the

scope of this study; however, studies about teacher confidence in academic content knowledge and instructional skills are highlighted with an emphasis on the variety of utilized assessment methods and outcomes. In addition to a discussion about teacher confidence, chapter 2 also includes studies highlighting teacher education program participants' perceptions.

Historical Assessment of Program Participants' Perceptions

As education researchers conduct research about teacher education program participants' confidence, they also research education program participants' perceptions. Specifically, they may assess the teacher perceptions of teacher education programs using a variety of methods to produce a range of outcomes (Darling-Hammond et al., 2000; Darling-Hammond, 2006a; Darling-Hammond, 2006c; Darling-Hammond, Newton, & Wei, 2010). As mentioned with the three previous historical assessments, the review of literature in Chapter 2 also provides a detailed discussion about education program participants' perceptions of teacher education programs. The discussion emphasizes the methods and outcomes of such studies. More importantly, the methods, along with outcomes of the highlighted studies contribute to the conceptual framework for this study.

The remainder of this chapter has six sections called: (a) statement of the problem and research questions, (b) significance of the study, (c) limitations of the study, (d) population and sample, (e) definitions of terms, and (f) summary of chapter one. While these sections are meant to introduce this study, the remainder of this dissertation (i.e. Chapters 2 through 5) provides detailed discussion of these sections.

Statement of the Problem and Research Questions

This study provides evidence that additional information besides number of certified teachers can be used to determine teacher education program quality. Instead of relying on certification passage rates as a gauge for education program quality, this study uses qualitative and quantitative data from aggieTEACH participants who (a) were near completion of the program (aggieTEACH student teachers) and (b) completed the program, (former aggieTEACH students). Descriptive and qualitative analysis of participants' perceptions provide answers to the following research questions, which relate to teacher education program quality:

1. What are current student teacher and former student teacher perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics?

2. Are there significant differences between current and student teachers and former student teachers on their perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics?

3. What do current student teachers and former students perceive about their teacher education program?

Significance of this Study

There are several reasons why this study is significant. First, this study assesses science and mathematics teacher education program quality. Most studies examine the quality of a teacher education program's single academic content area such as science or mathematics. Additionally, there are fewer studies that consider science teacher education program quality. Second, this study examines program quality by assessing participant's confidence in and perceptions of knowledge and skills. Unlike considering the numbers of

13

graduates and/or certificates from a program as quality measures, this study considers comments from the program's participants as a proxy for quality. TAMU College of Education Human Development administrators along with College of Science administrators may use outcomes from this study to reform aggieTEACH, the secondary science and mathematics baccalaureate teacher education program and the subject of this study. Both departments work in conjunction with the program and collected data from the on-line self-assessment tool informs both sets of administrators and teacher educators about participant confidence and perception levels, data analysis could lead to program reform or enhancements, indicating the collected data are quality indicators. Finally, this study is significant because data for this study was collected via an on-line self-assessment tool. The development of the on-line tool allows easy dissemination to other science and mathematics teacher education programs that may elect to adopt the tool.

Limits of this Study

The limits of this study relate to the scope of application to other teacher education programs and the instrument for data collection. First, this study describes the quality of the aggieTEACH program at TAMU via participant self-assessed confidence and perception levels in three aspects: programmatic characteristics, pedagogical skills, and knowledge of state college and career standards. Next, this study is limited to the aggieTEACH students enrolled during Spring 2012, and former students who completed program requirements between August 2006 and December 2011. These participants' perceptions and confidence levels about aggieTEACH programmatic characteristics, pedagogical skills, and standards-based academic content knowledge are examined in this study. All recent graduates' perceptions and confidence levels are not examined in this study. Finally, this study is limited

14

to requested descriptive data—graduation date and length of employment or experience as a classroom teacher was not requested from participants who completed aggieTEACH education program requirements between August 2006 and December 2011.

Population and Sample

AggieTEACH participants define the population of this study; specifically, 350 former students who completed aggieTEACH requirements between August 2006 – December 2011 and 19 current student teachers enrolled during Spring 2012 are the population of this study. The sample consists of 78 former students and 11 current student teachers.

Definition of Terms

This study routinely refers to following terms defined as:

Accreditation – State or professional issued designation, recognizing adherence to and completion of program structure requirements as indicated by set standards.

Alternative education program – Post-baccalaureate education courses and experiences toward P-12 teacher certification/licensure that occur in institutions of higher education and non-profit, and for-profit education settings.

Current student teacher – Education program student, enrolled and participating in their final semester of student teaching. For this study, the final semester of current student teacher participants was Spring 2012.

Former student – Education program graduate who is certified/licensed to instruct courses in a P-12 public school setting.

Participants – Current student teachers of Spring 2012 and former students who completed aggieTEACH requirements between August 2006 – December 2011.

Pathway – Setting and education course plan for P-12 public school teacher certification/licensure.

Pre-service Teacher – Teacher education program participant who is completing program requirements with the intent to obtain state teacher certification/licensure.

Program – Teacher education courses and experiences that fulfill education degree and/or P-12 public school teacher certification/licensure requirements.

Proxy – a publically accepted certificate, symbol, or substitution for experience or presence.

School-based mentor teacher – A classroom teacher who instructs P -12 classes while a student teacher observes and/or teaches; A P-12 classroom teacher who supports professional cultivation of a pre-service teacher.

Student teacher – Enrolled participant of a teacher education program who is observing, leading, and/or co-teaching in a P-12 classroom setting.

Teacher certification or licensure – State issued certificate or license for education of the public's children, recognizing completion of education and preparation requirements as indicated by state standards.

Teacher education program - Education courses and experiences toward P-12 teacher certification/licensure that occur in institutions of higher education and non- profit, and for-profit education settings, during baccalaureate or post – baccalaureate matriculation.

Teacher educator – Faculty or instructors of education courses and experiences toward P-12 teacher certification/licensure.

Traditional education program – Education courses and experiences toward P-12 teacher certification/licensure that occur in college or university settings, during baccalaureate or post – baccalaureate matriculation.

Summary of Chapter One

This chapter introduced four topics: teacher education program quality, teacher preparation, and teacher education program participants' confidence and perceptions. These topics collectively contribute to a new understanding of assessing teacher education program quality. As numbers of certified teachers from teacher education programs are common proxy for education program quality, confidence and perceptions of education program participants may provide a better understanding of quality. This study analyses participant self-assessed confidence and perceptions from a teacher education program called aggieTEACH. Specifically, the study examines and describes aggieTEACH confidence and perception in terms of programmatic characteristics, pedagogical skills, and knowledge of state standards. A review of literature provides a conceptual framework for this study; this review follows in Chapter 2.

CHAPTER II

REVIEW OF RESEARCH

Secondary mathematics and science teacher education programs (TEPs) are receiving national scrutiny due to poor K-12 student achievement on national and international exams (National Academy of Sciences, 2003; National Academy of Sciences, 2007; National Commission on Excellence in Education, 1983; National Research Council, 1999; National Research Council, 2010). Additionally, scrutiny occurs because of poor TEP evaluation histories (Amrein-Beardsley, Barnett, & Ganesh, 2013; Metzler & Blankenship, 2008; Plecki, Elfers, & Nakamura, 2012), low science and mathematics teacher retention (Burstein, Czech, Kretschmer, Lombardi, & Smith, 2009; Ingersoll & Perda, 2009; Zientek, 2006), low science and mathematics teacher certification numbers (Burstein, Czech, Kretschmer, Lombardi, & Smith, 2009; Seymour, 2001; Zientek, 2006), low persistence rates of students in mathematics, science, and engineering programs (Seymour, 2001; Zientek, 2006), and subsequent low eligibility rates for American Science, Technology, Engineering, and Mathematics (STEM) employment opportunities (President Obama highlights Michigan education program to improve preparation of math and science teachers
.2010; National Academy of Sciences, 2003; Seymour, 2001). These causes are discussed as effects of poor TEP quality, impacting the programming that often occurs to prepare future science and mathematics teachers.

As previously mentioned, TEP scrutiny has been linked to several causes such as student achievement, teacher retention, and low employability rates for STEM careers. These causes result in revised TEP accreditation standards, revised K − 12 curriculum standards,

analysis of TEP participant perceptions and confidence levels, and research in TEP quality assurance procedures and TEP evaluation (Amrein-Beardsley, Barnett, & Ganesh, 2013; Darling-Hammond, 2008; Metzler & Blankenship, 2008; Plecki, Elfers, & Nakamura, 2012). Interestingly, these results are targets for reform mechanisms driving TEP improvement. The studies that are featured in this review of research connect their studies to one or more of these reform mechanisms. Since TEP improvement is the overall purpose of this study, these reform mechanisms are also the subject of this literature review.

This literature review has five sections. The first section references Texas teacher population numbers, TEP accreditation standards and revised K – 12 curriculum standards, in conjunction with Texas public education certification requirements and standards. TEPs implement these standards as curriculum guideposts of TEP courses/programs and criterions for the overall TEP organization. The second and third section highlights literature on TEP participant confidence and perception. TEP participants are primary stakeholders of TEP outcomes; their confidence levels and perceptions about their education training is linked to their participation in TEPs. Finally, the last section describes TEP quality assurance and evaluation histories. Comparisons are made between prior research about TEP quality assurance measures and evaluation histories situating this study in the literature.

Texas Public Education Teacher Population, Certification and Standards

This section provides limited context to Texas Public Education teacher education. There are TEP standards for educating and training prospective and full time K-12 classroom teachers during baccalaureate and post-baccalaureate programs. There are also several education pathways impacting TEP participants in different ways. For the scope of this study, this section only has information about standards and certification requirements affecting

TEP baccalaureate participants. Specifically, this section begins with science and mathematics teacher population numbers, Texas mathematics and science teacher certification rates, and an explanation about Texas K-12 curriculum standards called Texas Essential Knowledge and Skills (TEKS), Texas College and Career Readiness Standards (CCRS) and Texas Educator Standards. After a general overview of each curriculum, specific information about Mathematics and Science TEKS and CCRS are presented in the text.

Texas Mathematics and Science Teacher Population

In the 2009 – 2010 school year, Texas public schools employed 338,604 classroom educators and full-time substitute educators (Texas Education Agency, 2011a). All educators were expected to teach the Texas Essential Knowledge and Skills (TEKS) objectives, the statewide standards for K-12 curriculum and instruction in many basic academic content areas (Texas Administrative Code, 1996). Of the reported employed educators in Texas, there were 62,297 (18.4%) mathematics certified educators and 54,595 (16.1%) science certified educators (Texas Education Agency, 2011b). Since this study focuses on Mathematics and Science teacher certification, Texas mathematics and science teacher certification rates follow.

Texas Mathematics and Science Teacher Certification Rates

There are 10 secondary mathematics and science certification areas for Texas public school educator certification. In 2010, Texas Educator certificates were awarded to 2,598 candidates in the areas of Mathematics 4 - 8 (n = 1,128), Mathematics 8 – 12 (n = 1,264), and Mathematics/Science 4 -8 (n = 206)(Texas Education Agency, 2011c). Additionally, Science educator certificates were awarded to 1,988 candidates in the certification areas of Chemistry (n = 82), Life Science (n = 419), Physical Science (n = 65), Physical

Science/Math/Engineering (n = 16), Physics/Mathematics (n = 45), Science 4-8 (n = 625), and Science Composite 8 – 12 (n = 736)(Texas Education Agency, 2011c). Receipt of Texas teacher certification is deemed to represent educator proficiency in teaching and knowledge about mathematics and science.

Texas Education Standards

As previously mentioned, Texas education is guided by a set of curriculum standards (see Figure 2) known as the TEKS, Texas CCRS, and the Texas Educator Standards. Pre-service teachers are taught about the TEKS and Texas CCRS during their preparation to become teachers. Pre-service teachers in Texas must also study the Texas Educator Standards and pass the Texas Examination of Educator Standards as part of K-12 teacher certification requirements (Texas Administrative Code, 1996; Texas Administrative Code, 2011a; Texas Administrative Code, 2011b).

Texas Public School

Texas Examination for Educator Standards

College Entrance

STAAR & End-of-Course

Texas Educator Standards:
Pre-service teachers

Texas College and Career Readiness Standards (CCRS):
Middle school (grade 6 – 8) and Secondary (grade 9 – 12) students, and
Post-secondary students of entry-level undergraduate courses*

Texas Essential Knowledge and Skills (TEKS):
Elementary (grade K – 5) students, Middle school (grade 6 – 8) students, and Secondary (grade 9 – 12) students

Figure 2: Texas education curriculum standards, assessments, and audiences. The assessments are aligned with the adjacent standards. Each set of standards acts as a foundational platform for the higher set of standards. Standards alignment occurs between the TEKS, CCRS, and Texas Educator Standards.

TEPs align their instruction with Texas Educator Standards as K-12 pubic school instruction is aligned with the TEKS. The Texas Administrative Code (1996; 2011a; 2011b) mandates alignment of all K-12 public school instruction to the TEKS. Additionally, Texas CCRS, secondary (grade 6 – 12) curriculum standards, have been developed to enhance the TEKS. Teacher alignment of K-12 instruction with the Texas CCRS is implied by alignment of instruction with the TEKS (Texas Higher Education Coordinating Board, 2008). Once pre-service science and mathematics teachers complete their TEP experience, they are trained in three sets of curricula and standards: Texas Educator Standards, TEKS, and the Texas CCRS. Specific information about the content and purpose of these standards follow.

Texas Educator Standards. Teacher Educator Standards exist for the major certification areas in Texas, are based on the TEKS (Texas Education Agency, 2011d), and guide many teacher education classes in TEPs. Texas teacher certification exams in various content areas and grade bands EC – 4, 4 – 8, and 8 – 12 are aligned with Texas Educator Standards. When teachers study the content and skills as listed in the Texas Educator Standards, they are studying standards based on the TEKS and Texas CCRS. When teachers know and understand the Texas Educator Standards of their certification area, they should also know and understand the TEKS and Texas CCRS for the same content area.

Texas Essential Knowledge and Skills (TEKS). The TEKS were created as a response to the need to clarify the previously created Texas standards called the Essential Elements. The TEKS indicate, at a minimum, what students should know and be able to do in each of the grade levels and subject areas with specific TEKS (Texas Administrative Code, 1996; Texas Education Agency, 2011d; Texas Higher Education Coordinating Board, 2008). The academic content and skills contained in the TEKS and Texas CCRS are used to create
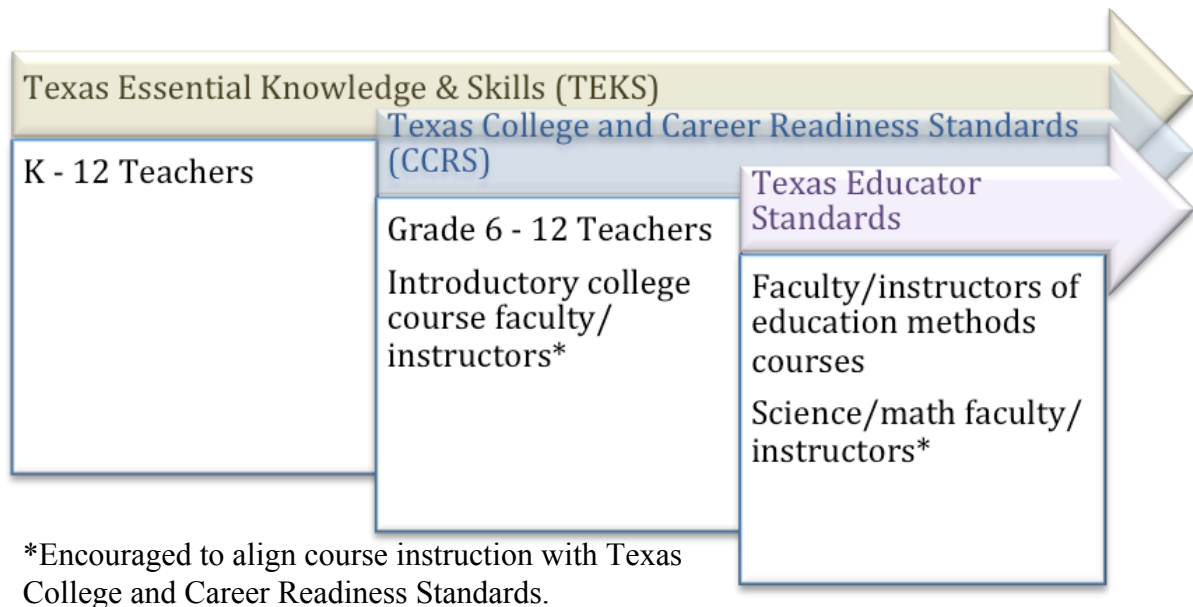
the STAAR exam, passage of which is thought to represent student understanding of the

content and skills within the TEKS and Texas CCRS (Texas Education Agency, 2011d;

Texas Higher Education Coordinating Board, 2008). Texas teachers are expected to align

their instruction with the TEKS and Texas CCRS to ensure students are prepared for

administration of STAAR exams (Texas Administrative Code, 1996). Consequently, the

TEKS imply the minimum curricular and content knowledge of teachers in Texas public

school classrooms (see Figure 2).

Texas Mathematics and Science TEKS

The Mathematics and Science TEKS were developed in response to the national

education trend of reforming science and mathematics education. The seminal work, the

National Commission on Excellence in Education, A Nation at Risk: An Imperative for

Educational Reform (1983) is believed to have started the science and mathematics education

reform movement. Mathematics, science, and technology standards featured in the texts,

Science for All Americans (1990) and Benchmarks for Science Literacy (1993), along with

The Curriculum and Evaluation Standards for School Mathematics (Lataille, 1996; Raban,

1998) and the National Science Education Standards (National Research Council, 1996)

precede the Mathematics and Science TEKS. Mathematics standards, published by National

Council of Teachers of Mathematics, were updated in 2000 and renamed, Principles and

Standards for School Mathematics. The Mathematics and Science TEKS are patterned after

all of these aforementioned works and are aligned with curricular standards supported by

national professional organizations like the National Council of Teachers of Mathematics and

the National Science Teachers Association. The Mathematics and Science TEKS represent

the minimum amounts of knowledge and skills needed by K – 12 mathematics and science teachers in Texas (see Figure 3).

Texas Essential Knowledge & Skills (TEKS)

K - 12 Teachers

Texas College and Career Readiness Standards (CCRS)

Grade 6 - 12 Teachers

Introductory college course faculty/ instructors*

Texas Educator Standards

Faculty/instructors of education methods courses

Science/math faculty/ instructors*

*Encouraged to align course instruction with Texas College and Career Readiness Standards.

Figure 3: Texas education standards with accountable educators (or disseminators) (Texas Administrative Code, 1996; Texas Administrative Code, 2011a; Texas Administrative Code, 2011b; Texas Higher Education Coordinating Board, 2008).

Texas College and Career Readiness Standards (CCRS). In recognition of the educational needs of an expanding and rapidly changing technology-based society, Texas created the College and Career Readiness Standards (CCRS). The Texas CCRS were approved in 2008 to increase the number of students who would be ready for either college or a career upon graduation from high school (Texas Higher Education Coordinating Board, 2008). The Texas CCRS were also developed to enhance the rigor and complexity of the TEKS (Texas Higher Education Coordinating Board, 2008). While the TEKS specify skills and content standards for K – 12 classes, the Texas CCRS specify what students should know and be able to do in introductory college level courses (Texas Administrative Code, 1996). Hence, the Texas CCRS are to be taught in conjunction with the TEKS in secondary grade

levels, for gradual preparation for either college or a career. To that end, the Texas CCRS were incorporated into the TEKS from 2008 through 2010 and are being disseminated for use by both secondary teachers and university faculty (see Figure 2).

Texas Higher Education Coordinating Board (THECB) grants funded dissemination activities by faculty collaboratives funded and encouraged university faculty to implement Texas CCRS (Texas Higher Education Coordinating Board, 2008). Faculty collaborative meetings provide training in innovative teaching practices that support implementation of the Texas CCRS. The meetings also foster collaboration between Texas universities and provide the faculty with the opportunity to design and showcase lessons aligned with the Texas CCRS. There is a faculty collaborative for each of the four core content areas of Science, Math, English/Language Arts and Social Studies. Secondary teachers experienced workshops designed to inform them about the integration of the CCRS within the newly revised TEKS. The CCRS were presented as required standards of higher student cognition and specialized activities (Texas Higher Education Coordinating Board, 2008).

Texas CCRS in Mathematics and Science

Secondary science teachers were introduced to the Texas CCRS during training on newly revised TEKS. The Science TEKS were revised and incorporated with the Texas CCRS in Science during the 2008 – 2009 school year. Secondary teachers were trained on the new Science TEKS in Spring and Summer 2010 for implementation during the 2010 – 2011 school year. A similar process for the Mathematics TEKS is scheduled for school years spanning 2011 – 2013, as the current Mathematics TEKS were revised and adopted in 2009.

Vertical teams consisting of public school and higher education representatives conducted gap analyses between the proposed Science TEKS and the Texas CCRS in

Science in September 2008. A separate vertical team was also convened to determine alignment between the Mathematics TEKS adopted in 2009 and the Texas CCRS in Mathematics. In both the Mathematics and Science sessions, the vertical teams were told only the TEKS could be changed to incorporate the appropriate Texas CCRS (Texas Higher Education Coordinating Board, 2008). After analysis and deliberations, the vertical team for mathematics determined strong alignment between the 2009 secondary Mathematics TEKS and the Texas CCRS in Mathematics. The TEKS considered for alignment were Mathematics for grades 6 – 8, Algebra I, Geometry, Mathematical Models with Applications, Algebra II, and Pre-Calculus. Similarly, the science vertical team determined adequate alignment between the secondary Science TEKS and the Texas CCRS in Science. The TEKS considered for alignment were Science for grades 6 – 8, biology, integrated physics and chemistry, chemistry, physics, astronomy, and earth and space science.

Rationale for the Texas CCRS

The Texas Higher Education Coordinating Board (THECB) (2008) says when secondary courses are aligned to the Texas CCRS, secondary teachers will prepare their students for the type of skills and academic content commonly encountered in college and introductory careers (Conley, 2003; Conley, 2005; Conley, 2010). Moreover, when introductory college courses are aligned to the Texas CCRS, university faculty will expose their students to the type of teaching that is expected by K – 12 teachers. Inherent to these statements are several inferences: (a) secondary teacher and university faculty training on and instructional alignment with the Texas CCRS can evoke positive changes to classroom practices, (b) knowledge of the academic content and skills in the Texas CCRS is sufficient to teach secondary and postsecondary academic content and skills, (c) teaching practices

aligned with the academic content and skills exhibited in the Texas CCRS will become a characteristic of new teachers. While each of the inferences is related to this study, only those related to determining the effectiveness of a TEP will be addressed.

The next section of this literature review reports findings about teacher confidence levels as a function of TEP quality. Teacher perceptions of TEP quality, along with a review of literature about science and mathematics teacher education preparation program evaluation conclude this dissertation chapter.

Defining Teacher Confidence

Teacher confidence is a TEP participant's personal belief about their ability to successfully complete or demonstrate a practice or concept in an education setting (Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998). Research about teacher effectiveness in the classroom has included assessment of teacher confidence levels (Champion, 2010; Copenhaver, Waggoner, & Young, 1997; Giebelhaus, 1998; Justice, Greiner, & Anderson, 2003; Samimi-Duncan, Duncan, & Lancaster, 2010; Thomas & Loadman, 2001; Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998). Often times, teacher confidence is linked with teacher self-efficacy – teacher knowledge that one is able to complete a desired classroom related task with an intended positive outcome (Bandura, 1977; Kerr, 2006; Samimi-Duncan, Duncan, & Lancaster, 2010; Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998).

While teacher confidence can be developed over time, as a classroom teacher, there is some debate about TEP participants developing teacher confidence before graduation by having certain experiences and opportunities during their TEP (Hill, Rowan, & Loewenberg-Ball, 2005; Hill, Loewenberg-Ball, & Schilling, 2008; Loewenberg-Ball & Williamson-McDiarmid, 1989; Loewenberg-Ball, Thueule-Lubienski, & Spangler-Mewborn, 2001;

Loewenberg-Ball, Thames, & Phelps, 2008). Hence, research about TEP participant confidence levels of K-12 teaching concepts and practices includes descriptions of varied TEP experiences and program characteristics (Darling-Hammond, 2008; Dean, Lauer, & Urquhart, 2005). This section presents TEP participant identified concepts and practices receiving high confidence levels, and TEP experiences and program characteristics used to contextualize those concepts and practices for K-12 settings - review of both allows us to shape an understanding about TEP quality.

TEP Concepts and Practices For K-12 Settings

Teacher confidence can increase as TEP participants learn concepts and practices for K – 12 settings (Singer, Catapano, & Huisman, 2010; Zeichner, 2010b). Research illustrates self-assessed TEP participant confidence levels by concepts and practices in a variety of articles. The reported concepts and practices include pedagogy and theory (Alghanem, 2005; Keller, Brady, Duffy, Forgan, & Leach, 2008; Korthagen, 2001; Lederman, Gess-Newsome, & Latz, 1994; Lederman & Latz, 1995; Lubinski & Otto, 2004; Lunenberg & Korthagen, 2009), classroom management (Miller & Stayton, 2006; Munby, Lock, & Hutchinson, 1999; Thomas & Loadman, 2001), instructional methods and strategies (Darling-Hammond, 2006b; Hill, Loewenberg-Ball, & Schilling, 2008; Loewenberg-Ball, Thames, & Phelps, 2008), lesson study (Cohan & Honigsfeld, 2006; Grossman, Hammerness, & McDonald, 2009), action research in the classroom (Atkinson & Bolt, 2010; Chou, 2010; Cohan & Honigsfeld, 2006; Lustick, 2009; Ong'ondo & Jwan, 2009; Samimi-Duncan, Duncan, & Lancaster, 2010; Whitney, Golez, & Nagel, 2002; Zeichner, 2007; Zeichner, 2010b), integrating technology in the classroom(Miller & Stayton, 2006; National Research Council, 1999; Simms & Ponder, 1997; S. B. Smith, Smith, & Boone, 2000; Stevenson, 1997; J. D. Wilson, 1993; Woodrow,

Mayer-Smith, & Pedretti, 2000), and insights about interactions with student families and school administrators (Atwater, Freeman, Butler, & Draper-Morris, 2010; Burstein, Czech, Kretschmer, Lombardi, & Smith, 2009; Dantas, 2007; Stamopoulos, 2006)

Initially, TEP participants experience a gamut of confidence levels when learning and applying TEP concepts and practices for K-12 settings (Champion, 2010; Chou, 2010; Cohan & Honigsfeld, 2006; Copenhaver, Waggoner, & Young, 1997; Justice, Greiner, & Anderson, 2003). Again, teacher confidence is measureable, developed overtime, and occurs at varied levels after varied TEP experiences (Kerr, 2006; Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998; Zeichner, 2007). To increase participant confidence, TEPs provide participants with as many contexts to practice in as possible (Darling-Hammond et al., 2000; Darling-Hammond, Chung, & Frelow, 2002; Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005; Darling-Hammond, 2006b; National Council on Teacher Quality, 2011a; National Council on Teacher Quality, 2011b). Most times these contexts are simulated K-12 classroom settings; on other occasions, participants practice in K-12 public schools.

TEP Experiences for K-12 Settings

TEP experiences allow participants to implement newly learned concepts and practices in new and varied contexts. Additionally, they are designed to allow participants to experience success during implementation. Example TEP experiences include designing lessons to illicit feedback about instruction and practice from peers, teacher educators, and K-12 students (Coble, DeStafano, Allen, Shapiro, & Frank, 2011; Darling-Hammond, Newton, & Wei, 2010; Samimi-Duncan, Duncan, & Lancaster, 2010), reflecting about purposes of concepts and practices for K – 12 classrooms (Bullock, 2009; Coffey, 2010; Dean, Lauer, & Urquhart, 2005; Lunenberg & Korthagen, 2009; Ong'ondo & Jwan, 2009),

29

having early and frequent interactions with school-age students as teacher aids in K-12 classroom settings (Alvis-Rhea, 2001; Colburn, 1991; Darling-Hammond, 2006b; Myers, 1996; Samimi-Duncan, Duncan, & Lancaster, 2010; Whitney, Golez, & Nagel, 2002; Williams & Alawiye, 2001), examining authentic assignments and assessments utilized in classroom settings (Atwater, Freeman, Butler, & Draper-Morris, 2010; Rieg & Wilson, 2009; Tillotson, 1996), and accessing curricula and resources most often used by school districts (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Dean, Lauer, & Urquhart, 2005; Justice, Greiner, & Anderson, 2003; Rieg & Wilson, 2009; Shea, 2006; S. M. Wilson, Floden, & Ferrini-Mundy, 2001, February). These experiences allow TEP participants to implement the previously mentioned concepts and practices for K-12 settings. When participants have these experiences, they are often asked to self-asses their confidence levels. During self-assessment, participants inadvertently indicate their perceptions about TEP characteristics and requirements. Literature about teacher perceptions appears in the next section.

Defining Teacher Perceptions

As mentioned in chapter 1, perception is insight, observation, judgment, and opinion about experiences or ideas (Burstein, Czech, Kretschmer, Lombardi, & Smith, 2009; Cummings, 2010; Stamopoulos, 2006; Yakar, 2007). Teacher education program participants have perceptions after experiencing program characteristics (Champion, 2010; Kerr, 2006; Zeichner, 2007). While example TEP experiences were listed in the teacher confidence section of this literature review, literature citing TEP participants' perceptions about TEP program characteristics occur in this section.

TEP Participant Perceptions

TEP participant perceptions vary across TEPs and their program characteristics. Example TEP participant perceptions consist of the following: beliefs that assignments are for program completion only and have no application in actual classroom settings (Nagy, Collins, Duschl, & Erduran, 1999; Nottis, Feuerstein, & Murray, 2000; Plourde, 2002; Terry, 2004; Whitney, Golez, & Nagel, 2002; Yakar, 2007), the scenarios, lessons, and strategies presented in TEPs classes are for ideal K-12 classroom settings only (Nagy, Collins, Duschl, & Erduran, 1999; Nuangchalerm & Prachagool, 2010; Zeichner, 2010b), the practices and mannerisms of teacher educators counter how one should teach in a K-12 classroom setting (Berliner, 2000; Bullock, 2009; Sykes, Bird, & Kennedy, 2010; Whitney, Golez, & Nagel, 2002; Zeichner, 2007), and finally, the strategies and skills demonstrated by TEP participants' K-12 teachers are acceptable for use in classrooms(Hammerness et al., 2005; Justice, Greiner, & Anderson, 2003; Keller, Brady, Duffy, Forgan, & Leach, 2008; Lampert, 2010; Zeichner, 2010a; Zeichner, 2010b). These sample beliefs connect with certain program characteristics; the beliefs are either increased or diminished by participation in TEP experiences.

TEP Program Characteristics

Most TEP program characteristics allow participants to have certain experiences aligned with accreditation requirements and researched-based best practices. Listed TEP program characteristics include having helpful and knowledgeable teacher educators (Dean, Lauer, & Urquhart, 2005; Ludlow et al., 2010; Rieg & Wilson, 2009; Singer, Catapano, & Huisman, 2010), and having and being assigned to university and school - based mentors (Leana, 2011; Ong'ondo & Jwan, 2009; Thomas & Loadman, 2001; Whitney, Golez, &

Nagel, 2002). Other TEP program characteristics include placing student-teachers in K-12 school-based settings (Boehmer & Waugh, 1997; Coffey, 2010; Darling-Hammond, 2006b; Darling-Hammond, Newton, & Wei, 2010; Grossman, Hammerness, McDonald, & Ronfeldt, 2008; Justice, Greiner, & Anderson, 2003), assigning mini and full lesson presentations in front of peers, K-12 students, and teacher educators (Cohan & Honigsfeld, 2006; Grossman, Hammerness, & McDonald, 2009; Hill, Loewenberg- Ball, & Schilling, 2008; Loewenberg-Ball & Williamson-McDiarmid, 1989; Loewenberg-Ball, Thames, & Phelps, 2008), requiring assessment portfolios for graduation requirements (Copenhaver, Waggoner, & Young, 1997; Darling-Hammond, Newton, & Wei, 2010; Dean, Lauer, & Urquhart, 2005; Wineburg, 2006), providing job location services job upon/nearing graduation (Burstein, Czech, Kretschmer, Lombardi, & Smith, 2009; Dean, Lauer, & Urquhart, 2005), and offering online coursework in conjunction with traditional modes of instruction(Davis & Roblyer, 2005; Keller, Brady, Duffy, Forgan, & Leach, 2008; Rieg & Wilson, 2009; S. B. Smith, Smith, & Boone, 2000). Participants develop their TEP perceptions according to these and many other program characteristics not listed above.

Their developed perceptions lead to personal judgments about TEP quality. Collectively reviewing perceptions of as many TEP participants as possible, along with other measurable objectives, may lead to quality assessments of a TEP.

As perceptions by TEP participants can be helpful in describing TEP quality, so can assessing participants' perceptions about a TEP's ability to influence and teach about instructional strategies (Grossman, 1990; Grossman, 2005; Loewenberg-Ball et al., 2001; Murray, Grande, DiCamillo, Henry, & Henry, 2008; Yakar, 2007). This dissertation evaluates TEP participant confidence, TEP quality, and TEP program characteristics.

Development of a TEP assessment requires review of previous TEP assessment procedures and outcomes. Hence, the last section of this chapter presents a review of TEP evaluation literature.

Evaluation of Teacher Education Programs

Program evaluation encompasses review of program characteristics through various methods such as stakeholder surveys and internal data reviews (Ayers & Berney, 1989; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Craig, 1989; Darling-Hammond, Newton, & Wei, 2010; Galluzzo, 1983, April; Munby, Lock, & Hutchinson, 1999; Singer, Catapano, & Huisman, 2010). Such program evaluation methods are now being used to evaluate TEPs. Moreover, program evaluation is being used to assess TEP quality because policy makers and the general public are concerned about teacher preparation (Cochran-Smith, 2001; Cochran-Smith, 2004; Cochran-Smith, 2005; Cochran-Smith et al., 2008).

Policy makers and the general public are interested in the results of TEP evaluations. Since they believe poor student achievement and low standing on international exams are related to incompetent teachers (Berliner, 2000), they believe TEP evaluation can reveal results, certain TEP's and program characteristics that can improve teaching and K-12 student achievement (Berliner, 2000; Cochran-Smith, 2005). However, education researchers indicate TEP evaluation results cannot all be linked to teacher and K-12 student achievement. Education researchers believe there are several mitigating variables that can account for successes and failures by K-12 students, teachers, and TEPs.

Education researchers declare connecting TEPs with teacher and K-12 student achievement is risky (Berliner, 2000; Cochran-Smith, 2005). While student achievement on standardized tests is thought to reflect student understanding of subject matter (Darling-

Hammond, 2004), other extenuating variables influence student performance on standardized tests (Berliner, 2000; Cochran-Smith, 2005). Documented extenuating variables are family income levels, parental education level, student and family health, and home environment (Zeichner, 2003; Zeichner & Conklin, 2005; Zeichner & Paige, 2007).

Hence, some educational researchers (Boyd et al., 2008; Boyd et al., 2009; Grossman, Hammerness, McDonald, & Ronfeldt, 2008) are developing and publishing more evaluation reports to assuage public criticism and guide the evaluation of TEPs toward sound research practices. The publishing of their reports in journal articles and on the Internet have created the knowledge base for this proposed study.

This research review of secondary mathematics and science TEP evaluations provides background information for this study. Evaluations in this review are about the evaluation of single TEPs, groups of TEPs, elementary mathematics TEPs, elementary science TEPs, and elementary and secondary mathematics or science TEPs. To assist with the development of this study on secondary mathematics and science TEPs, the following sections present proxies for TEP efficacy, theoretical frameworks and evaluation models, and suggested participants in TEP evaluations.

Common Proxies For TEP Efficacy

A proxy is an indicator of the presence of an achievement, event, idea or phenomenon (Grossman et al., 2009; Kenyon, Davis, & Hug, 2011; Kerr, 2006). Policy makers and the general public are declaring student achievement as proxy for teacher and TEP quality (Cochran-Smith & Fries, 2005; Cochran-Smith, 2005; Cochran-Smith et al., 2008). To the contrary, evaluations of TEPs reference participant pre- post scores on standardized content exams (Craig, 1989; Galluzzo, 1983; Krajcik & Penick, 1989; Van Zandt, 1998), levels of

teacher efficacy (Van Zandt, 1998; Wilson, 1996), amount of field experience (Alvis-Rhea, 2001; Coffey, 2010; McKeny, 2006; Munby, Lock, & Hutchinson, 1999; Myers, 1996; Zeichner, 2010b; Zimpher, 1989), perception about programmatic components (Metzler & Tjeerdsma - Blankenship, 2008), and overall satisfaction (Metzler & Tjeerdsma - Blankenship, 2008; Pepper & Hare, 1999; Smith, Smith, & Boone, 2000) as proxy for TEP efficacy. Unfortunately, these proxies have limited applicability across TEPs because of TEP demographic and programmatic differences.

Additional literature reveals other proxies for TEP efficacy. Other articles list number of courses in the TEP (Boyd et al., 2008; Boyd et al., 2009), content of courses and course syllabi (National Council on Teacher Quality, 2011a; National Council on Teacher Quality, 2011b), and TEP faculty credentials (National Council on Teacher Quality, 2011a; National Council on Teacher Quality, 2011b) as proxy for TEP efficacy. Similar to the previously mentioned proxies, these proxies also have limited applicability because other variables mitigate their effect.

Considered Frameworks and Evaluation Models

The conceptual framework and evaluation model for this study is patterned after several TEP evaluations. The most influential are evaluations of a senior block field experience within Mississippi State University (Pepper & Hare, 1999), a study on the reform oriented elementary science teacher education program at University of Michigan – Dearborn (Luera & Otto, 2005), and an assessment of the field experiences of elementary STEM teachers at Kansas State University (Wilson, 1993; Wilson, 1996).

Pepper and Hare (1999) framed their evaluation of senior block field experiences by Yarger and Smith's (1990) systemization process of TEP evaluation. Yarger and Smith

(1990) encouraged review of a program's (a) preexisting conditions, (b) processes, and (c) outcomes. The proposed study will use this systemization process to gather a complete view of programs via an evaluation model that encourages varied data collection techniques and two groups of participants.

Framework for this Study

The present study has some similar and divergent frameworks that connect to the background studies highlighted in this literature review. For instance, this study uses state standards as part of its evaluation frame for pre-service teacher efficacy and TEP efficacy. Luera and Otto (2005) framed their evaluation of an elementary science TEP evaluation using constructivist-learning theory, national and state standards, thematically based instruction, and development of reflective practice. Kerr (2006), Thomas and Loadman (2001), and Wilson (1993; 1996), framed elementary STEM TEP evaluations by teacher self-efficacy and attitudes towards science and science teaching. Additionally, this study explores stakeholder confidence in the TEP and level of emphasis on programmatic components, teacher perceptions, and overall TEP quality.

Teachers are required to know academic content and skills and instructional strategies and learning theories. Texas educator standards, which are connected to the student curriculum standards (Texas Administrative Code, 1996; Texas Education Agency, 2011d; Texas Higher Education Coordinating Board, 2008), provide some insight into the requisite instructional strategies and learning theories and academic content and skills.

Hence, participants of Texas TEPs have likely been exposed to all the knowledge and skills for their certification area when they meet these standards (Texas Administrative Code, 1996; Texas Administrative Code, 2011a; Texas Education Agency, 2011d).

Participants in TEP Evaluations

Articles about TEP evaluation reveals that current and former students are the most likely respondents (Zeichner, 2003; Zeichner & Conklin, 2005; Zeichner, 2006; Zeichner & Paige, 2007). TEP evaluation participants have also been university faculty, school administrators, TEP participant mentors and supervisors, community members, and TEP administrators (Cochran-Smith, 2004; Cochran-Smith & Zeichner, 2005; Lubinski & Otto, 2004; Luera & Otto, 2005; Metzler & Tjeerdsma - Blankenship, 2008; Wilson, 1996; Zeichner & Conklin, 2005). To the contrary, none of the cited studies collected data from all of the aforementioned stakeholders in unison. While data was collected from all the stakeholders mentioned above, only the data related to current and former TEP students are presented in this study.

In the present study, data collected from all of the stakeholders substantiates the accuracy of findings. This technique is similar to triangulation procedures used in qualitative studies – evidence from other sources is used to support findings determined from a single data collection method (Erlandson, Harris, Skipper, & Allen, 1993; Lincoln & Guba, 1985; Munby et al., 1999). Triangulation increases the validity and reliability of the study (Erlandson et al., 1993; Golafshani, 2003; Lincoln & Guba, 1985).

In the majority of the studies where current students were used as the main group of participants for data collection, biases in the study had to be addressed. TEP student selection criteria was questioned, current student education level, age, and level of exposure to education courses all became an issue. Data collection from numerous evaluation participants and triangulation should help to alleviate the potential biases that could be generated by only using data from one type of participant. However, the scope of this study will only highlight

the data generated by current and former student teachers.

Summary of Chapter Two

This review of research about teacher education programs (TEPS) primarily includes information about Texas TEPS. The review begins with information about Texas Public Education Population, Certification, and Standards. Then, the review broadens, providing information across several works related to teacher confidence, perceptions, and knowledge. Lastly, the review concludes with previous research about teacher education programs.

The next chapter in this dissertation is called Chapter 3 Methods. Specific details about participant demographics, a description of the TEP, and the data collection methods and analyses occur in this chapter. Results will be presented in chapter 4, while a discussion of findings and the conclusion will be presented in chapter 5.

CHAPTER III

METHODS

I, along with researchers at the State of Texas Education Research Center (ERC) at TAMU, conducted an evaluation of three TAMU teacher education programs during Spring 2012. The aggieTEACH Mathematics and Science Secondary Teacher Certification program (hereafter called, aggieTEACH) was one of the three programs evaluated. After data collection was complete, I requested permission from the ERC to use aggieTEACH data for the focus of this study. This data is unique because it reflects an undergraduate secondary Science and Mathematics program and there are few studies about such programs (Cochran-Smith & Zeichner, 2005; National Research Council, 2010). This chapter presents methods for collecting and examining the aggieTEACH evaluation data.

Since this study analyzes a portion of data—aggieTEACH data—collected from the original ERC evaluation, there are two TAMU Institutional Review Board (IRB) approvals. The first is a TAMU IRB approval protocol for data collected from the three TAMU teacher certification programs; the second, included in Appendix A, is approval for analyzing the aggieTEACH data for the present study. The isolated aggieTEACH data from the original ERC study are secondary de-identified data, as I was not given the names and email addresses of participants who were connected with the data. In compliance with both TAMU IRB protocols, there was no attempt to re-contact or re-consent participants of aggieTEACH for this study.

My study is a mixed methods study utilizing self-assessment surveys within a concurrent triangulation design (See Figure 4)—mostly quantitative data from Likert- scaled

portions of surveys are compared to and validated by participants' responses to open-ended

questions at the end of surveys(Creswell & Plano-Clark, 2007). I analyzed current student

teacher and former student participants' perceptions about aggieTEACH (a) statements about

teacher certification programmatic components, (b) statements about levels of programmatic

emphasis on instructional skills and pedagogical knowledge, and (c) confidence in teaching

academic content as supported by the Texas Essential Knowledge and Skills (TEKS) and the

College and Career Readiness Standards (CCRS). Quantitative data was analyzed using

descriptive and inferential statistical analyses. Qualitative data from the open-ended portions

of the surveys were analyzed by content analysis and used as anecdotal evidence of

participant perceptions about and confidence in aggieTEACH program characteristics and

experiences.

Procedures:
Structured survey with Likert-scaled items (n=98)

QUAN data collection: Survey

Products: Numerical scores

Procedures: Open-ended survey (n=98)

qual data collection: Open-ended survey items

Products: Written responses

Procedures: Frequency analysis ANOVA

QUAN data analysis

Products: Group classification

Procedures: Content analysis Count occurrences

qual data analysis

Products: Emergent themes Percentages

QUAN results

qual results

Procedures: Create comparison matrices

Validate QUAN results with qual results

Products: Comparison matrices Discussion relating data

Interpretation QUAN + qual

Figure 4: Concurrent triangulation model of study.

Overview of the aggieTEACH Program

The aggieTEACH program, formerly named the Mathematics and Science Scholars (MASS) program, was established with the Center for Mathematics and Science Education in 2001, within the College of Science. State and federal grants with private foundation monies fund the aggieTEACH program. Unlike other TAMU secondary teacher certification programs, aggieTEACH prepares undergraduate mathematics and science majors for certification to teach secondary science and/or mathematics courses in Texas public schools together while obtaining a bachelors degree in a science or mathematics related content area (Whitfield, Scott, Wilding, & Bentz, 2014).

To comply with Texas teacher certification requirements, aggieTEACH offers students flexible entry points. Certification requires completion of coursework toward a major in biology, chemistry, mathematics, or physics and 22 hours of education pedagogy coursework. Pedagogy courses are scheduled to occur in place of some elective courses toward the science or mathematics major; they include education courses both with and without field-based experiences. Field experiences require pre-service teacher observations of an experienced teacher; these observations occur in conjunction with attending a face-to-face class usually once per week.

Program advisors of aggieTEACH and customizable degree plans help students with the challenge of deciphering which education pedagogy courses to take and when. As students are more likely to complete the undergraduate degree along with teacher certification, advising and customized degree plans play a crucial role in completing the program (Scott, Milam, Stuessy, Blount, & Bentz, 2006).

Flexible entry points in aggieTEACH increase the likelihood students can finish (Scott, Milam, Stuessy, Blount, & Bentz, 2006). Freshmen, sophomores, and juniors are accepted into the program. For this reason, the number of required education courses taken during the junior year increases as students wait to enter aggieTEACH—there is also less flexible course selection for these students if entering as a junior or senior. For example, students beginning the program as juniors must take 2 - 3 education courses per semester until their final senior semester. To the contrary, students who start the program during their freshman year experience one education course per year for their first two years; their number of courses increases to 1 – 2 courses per semester during the junior year.

Students in the program complete student teaching with a mentor teacher during their final year at TAMU; this is different from the other two secondary teacher certification programs at TAMU, the Secondary Post-Baccalaureate Certification Program (hereafter called the Post-Bac program) and the Accelerated Online Secondary Certification Program (hereafter called Accelerate Online). The field-based teaching requirements of the other two TAMU secondary teacher programs require a yearlong internship, where students are often the teacher of record and a mentor teacher is not present. While both the Post-Bac and Accelerate Online programs offer secondary certification in mathematics and science, neither certifies undergraduate students while completing undergraduate course requirements. A summary chart of programmatic characteristics for aggieTEACH and the other TAMU secondary teacher certification programs appear in Appendix B. The summary chart contains Spring 2012 student enrollment numbers, former student certification numbers, program certification areas, and field experience types. The TAMU College of Education and Human Development offer the Post-Bac and Accelerate Online programs, whereas the aggieTEACH

program is offered by the College of Science in collaboration with the College of Education and Human Development. A review of the summary chart distinguishes how aggieTEACH is different from the other two programs.

Participants in this Study

The word participants in the present study refer to (a) current aggieTEACH student teachers and (b) former students of aggieTEACH,. These participant types were purposefully chosen because they represent two facets of the aggieTEACH teacher preparation program: those who are near completion of the program (current aggieTEACH student teachers) and those who have completed the program (former aggieTEACH students). Descriptors for each of the aggieTEACH participants follow:

- Current students were near completion of a secondary certification in a science and/or mathematics related field. They were enrolled in their final semester of student teaching during Spring 2012.

- Former students hold a teacher certificate in secondary mathematics and/or science (e.g. life science, physical science, chemistry, and composite science). They completed all coursework and student teaching by December 2011.

Current Student Teacher Participants

The current aggieTEACH student teacher pool consists of undergraduate students who have declared participation in the aggieTEACH program, are a science or mathematics major or University Studies Science, Technology, Engineering, or Mathematics (STEM) minor, and were student teaching (enrolled in TEFB 423) during Spring 2012. There were approximately 150 students enrolled in secondary science and mathematics methods courses of TAMU teacher certification programs (Department of Teaching, Learning and Culture,

44

2011) and/or student teaching. Student teaching marks the final phase of teacher preparation in the program. During Spring 2012, there were 19 aggieTEACH students enrolled in student teaching. To ensure students were able to consider experiences from the majority of programmatic components of aggieTEACH, only students who were student teaching were requested to participate in this study. Of the 19 aggieTEACH current student teacher participants, only 11 respondents provided surveys. Names and email addresses of current student teachers were compiled from the aggieTEACH program office and the TAMU field placement office.

Former Student Participants

Since 2001, approximately 350 undergraduate students acquired certification through the aggieTEACH program to teach secondary math or science (aggieTEACH, 2011). Students who completed aggieTEACH requirements from August 2006 – December 2011 are considered former students in the study. I accessed program records to determine former students' contact information. The contact information consisted mainly of the students' name, email addresses and Universal Identification Number (UIN). Former students' contact information was verified through the Association of Former Students in the TAMU alumni office. Of the 350 aggieTEACH former student participants, only 78 respondents provided surveys.

Potential Limitations

The convenience of the participant sample and absence of comparison between the statements about teacher preparation program characteristics and confidence levels of aggieTEACH participants with another program's participants limit the generalizability of this study. Further, former students' graduation and certification completion date may affect

their judgment about aggieTEACH. An in-depth discussion about the limitations of this study is beyond the scope of this chapter and is presented in Chapter 4: Results and Findings. The following section provides information about the data collection instruments electronically administered to participants in this study.

Instruments for this Study

Two surveys were adapted and designed to collect data from (a) current aggieTEACH student teachers (hereafter called current student teachers), and (b) former students of aggieTEACH (hereafter called former students). Each survey has both Likert- scaled elements and open-ended questions. Specifically, the current student teacher survey has 6 questions that collect demographic data, 19 matrix sections with statements on a $1 - 4$ Likert-scale, and 4 open-ended questions. Since the survey branched by participant selection of certification area (question #6), the aggieTEACH current student teachers that selected mathematics and/or science related certifications, could only respond to 15 or 17 matrices. Hence, the total number of possible items on the current student teacher survey was 134 items (if pursuing both mathematics and science certifications).

Similar to the current student teacher instrument, the former student instrument has 8 questions that collect demographic data, 21 matrix sections with statements on a 1-4 Likert Scale, and 4 open-ended questions. Since the survey branched by participant selection of certification area (question #5), the aggieTEACH former students, who selected mathematics and/or science related certifications, could only respond to 15 or 17 matrices. Hence, the total number of possible items on the former student survey was 136 items (if both mathematics and science certifications were received).

The 1-4 Likert-scale allowed participants' to self-assess their agreement and confidence levels about aggieTEACH programmatic characteristics, pedagogical skills, and standards-based academic content knowledge. Open-ended questions elicited descriptive and clarifying information about the program. All surveys were administered electronically with a response deadline of 5 weeks.

Participants were offered a $25 gift card to complete the survey and as a method to increase response rates above a 20% minimum. The minimum 20% response rate for electronic survey data collection was established after consulting research related to the evaluation of teacher preparation programs (Cobanoglu, Warde, & Moreo, 2001; Kaplowitz, Hadlock, & Levine, 2004; Sheehan, 2001; Thach, 1995) An overview of all instruments for this study appears in Appendix C., The overview consists of the title of each instrument, the participants, classification of the associated data as quantitative or qualitative, and a description of the instrument.

Format of Instruments

Surveys for each of the participant groups consisted of two parts, an electronic informed consent page and survey items. The electronic informed consent page of each survey was approved by the TAMU IRB; the survey items were adapted from questions related to universally accepted best practices (Cochran-Smith, 2005; Cochran-Smith & Zeichner, 2005; Darling-Hammond, 2006a; Darling-Hammond, 2007; National Research Council, 2010), studies considering the effectiveness of Teacher Preparation Programs (Boyd et al., 2008; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Darling-Hammond, 2006a; Darling-Hammond, 2010; Dean & Lauer, 2003; Dean, Lauer, & Urquhart, 2005; Halpin, 1999; Lewis, Parsad, Carey, Bartfai, & Smerdon, 1999; Niess & Scholz, 1999), and the

College and Career Readiness Standards (Texas Higher Education Coordinating Board, 2011).

The surveys for current aggieTEACH student teachers and former aggieTEACH students are similar. They both contain demographic items designed to determine a participant's gender, ethnicity, certification area, program area and declaration of student teaching or school internship. Additionally, both surveys contain items to collect data about aggieTEACH participants' agreement about and confidence level in pedagogy, mathematics and science instruction, programmatic components of aggieTEACH, and using state and national standards during classroom instruction and lesson planning. These previously mentioned items were adapted from the Survey of Program Graduates, Year 1 Survey from the Teacher Pathways Project (Boyd et al., 2008; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009). Survey items about standards-based teaching and lesson planning were adapted from the Halpin (1999) study and CCRS (Texas Higher Education Coordinating Board, 2011).

Limitations of the Instruments

Generalizability of the results and findings of the present study are compromised by the type of instruments used to collect data. The surveys require participants to provide self-evaluation of the aggieTEACH program; such data may not accurately describe the program. More information about the limitations of this study is beyond the scope of this chapter and is presented in Chapter 4: Results and Findings. The following section provides information about the analysis of collected data.

Data Collection and Analysis

I assisted ERC researchers in formatting the surveys for dissemination and data collection using Snap (version 10) software. Once all three surveys were formatted, Snap facilitated generation of a unique Internet link to the respective electronic surveys. Researchers placed the link in an electronic invitation; the invitation was emailed to participants fitting the profiles mentioned in the participant section of this chapter. The invitation to participate in the study provided information about the purpose of the study, how a gift card could be obtained upon completion of the survey, and the approximate time needed to complete the study. Weekly reminders were sent to non- response participants; reminders occurred over a 4-week period.

Data Collection

When current student teachers and former students read the opening page of the survey, they learned the purpose of the survey—the opening page of the survey was the informed consent form for the study. Consenting participants were asked to submit their perceptions about aggieTEACH programmatic characteristics and experiences. These perceptions were captured as statements that required participants to indicate their agreement or confidence level. Data collection with respect to these elements occurred within several sections of the survey. Those survey sections are as follows: Participant Descriptors, Prerequisite Courses, Field Experiences, General Instruction, Mathematics or Science, Online/Hybrid Classes, English as a Second Language, Teaching Special Populations, Professionalism/Professional Growth, Mentor Teachers/University Supervisors, Student Teaching, Internship, Instructors, Current School Environment, and Reflections/Future Aspirations.

The survey was designed with branching protocols. Branching protocols allow certain survey items to appear via participant responses. Upon completion of demographic items, participants were instructed to select their type of teacher preparation program, certification area and type of field experience. For example: If a participant selected biology as their certification area, items written specifically for measuring agreement and confidence in secondary mathematics educator preparation characteristics and experiences were excluded from the survey.

In addition to receiving subject-specific survey items, participants also received items related to cross-disciplinary skills and knowledge. Such items about integrating subjects to encourage cross-disciplinary skills and knowledge were presented in a general instruction section within the survey. Branching was not used to narrow the scope of the general instruction section and all participants received this section of the survey instrument.

Participant incentive for data. Once participants finished the survey, they were offered a $25 gift certificate. The instructions for a $25 gift certificate requested participants to submit their name and email address. This data was immediately separated from survey responses by Snap and submitted to the ERC administrative assistant in compliance with TAMU IRB confidentiality protocols. Incentives were offered at the end of surveys for (a) current student teachers and (b) former students.

Data Analysis

Descriptive and inferential analyses were used on data collected from current student teachers and former students. Descriptive analysis provided a profile of the participants from data collected in the descriptor section of the surveys. The descriptor section acquired data describing participants Sex, Ethnicity, Type of Teacher Preparation Program, Certification

Area, Type of Field Experience, and Years of Teaching Experience. Measures of central tendency (i.e., Mean and standard deviation) in these items and items in all other sections of the survey were calculated. Inferential statistics allowed comparisons between participant descriptors, statements, and confidence levels of skills taught by faculty of aggieTEACH. Analysis of variance (ANOVA) was used to determine main effects and interactions between program components and participant groups. All quantitative data analysis was carried out using IBM Statistical Package for the Social Sciences (SPSS) (version 21) software.

Content analysis with constant comparison was used to discover emergent themes from the qualitative data generated by the program's participants. Current student teacher and former students surveys contained open-ended response questions that provided the qualitative data. Constant comparison (Erlandson, Harris, Skipper, & Allen, 1993; Lincoln & Guba, 1985) was used to code and analyze emergent themes from the participants' responses. Participants were requested to describe helpful or relevant program experiences, possible programmatic changes or improvements, and any additional information about the program. Participant responses were cross-tabbed by themes and participant groups to provide percentages of applicability. The percentages of thematic applicability by participant groups were compared to the descriptive and inferential statistics made possible by quantitative data generated by the Likert-scaled portion of the surveys. Comparison between emergent themes and Likert-scaled survey results helped to substantiate conclusions about participant statements about the program's components and levels of agreement and confidence in participant knowledge of practices supported by the TEKS and CCRS. Where possible, participant statements where associated with results of the descriptive and inferential statistical analyses.

51

Summary of Chapter Three

I worked as a graduate research assistant with the TAMU ERC in Spring 2012. During my assistantship, we conducted an evaluation of three TAMU teacher education programs. The aggieTEACH science and mathematics teacher education program was one of the programs. As previously mentioned in chapter 1, aggieTEACH, is a traditional, early field placement, baccalaureate program within two departments of Texas A&M University – the Teaching Learning and Culture department of the College of Education and Human Development and the Center for Mathematics and Science Education of the College of Science.

Participants in this study were former students and Spring 2012 current student teachers of aggieTEACH. They responded to Likert-scaled surveys that branched and had open-ended survey items. I gained accessed to their data as secondary de-identified data and analyzed it for this study.

Descriptive and inferential analyses were used for the quantitative data generated by participants. Content analysis with constant comparison was used for the qualitative data. Where possible, I compared quantitative results to qualitative findings.

The following results chapter includes quantitative results with qualitative findings for the aforementioned research questions. Quantitative data are presented in tables depicting participant descriptors, statements, and agreement and confidence levels of knowledge and skills taught by aggieTEACH faculty. Qualitative data from participant statements are associated with percentages of applicability to emergent themes. The following results section is presented according to the research questions--comparisons are drawn between data obtained from current student teachers and former students.

CHAPTER IV

RESULTS

This chapter has two major sections. The first section reports the quantitative results relevant to this dissertation. The quantitative results answer the following research questions:

1. What are current student teacher and former student teacher perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics?

2. Are there significant differences between current and student teachers and former student teachers on their perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics?

The second section reports qualitative findings. These findings answer the remaining research question:

3. What do current student teachers and former students perceive about their teacher education program?

In the first section, quantitative results describe aggieTEACH current and former student teacher participants' perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics types. I describe these results and present data tables. In the second section, qualitative data from participant statements are associated with percentages of applicability to emergent themes. I organize the data by participant type and analysis type and define comparisons between current student teachers and former students. Knowledge types refer to school contextualized knowledge (SCK), academic content knowledge (ACK) and pedagogical content knowledge (PCK).

Quantitative Results by Research Questions

The total participants in this study consisted of 11 current student teachers and 78 former students. Each of the current student teachers were enrolled in aggieTEACH during the Spring 2012 semester, while all former students had varying enrollment and graduation years. Of these current student teachers and former students, 77.5% (n = 69) were female, 21.3% (n = 19) were male and 1.1% (n = 1) did not disclose their gender. Additionally, they are primarily Caucasian, with 80.9% (n = 72) identifying as white, 9% (n = 8) identifying as Hispanic, 7.8% (n = 7) identifying as African American, Asian, or other, and 2.2% (n = 2) deciding not to disclose their race.

This study focuses on teacher perceptions of their science and mathematics teacher education program; moreover, aggieTEACH certifies science and mathematics teachers. The most common certification sought by participants was in Mathematics, with 52.8% (n= 47) declaring to have been certified in the area. Science composite followed, with 19.1% (n = 17) having been certified. The least common subject was in physics, with only one subject having the certification. Refer to figure 5 for a display of the percentage of the sample with different subject certifications.
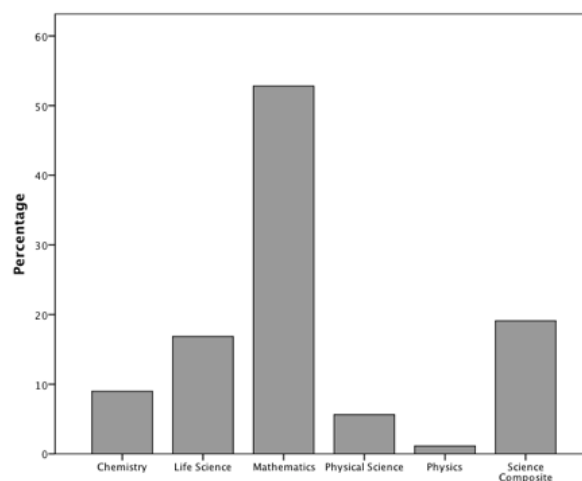
Figure 5: Participant percentages by Texas certification areas.

Current student teachers and former students were given surveys, which queried about TEP experiences and characteristics. The surveys applied to many different TEP participant types. Potential TEP participant types were mentor teachers, teacher educators (faculty), TEP administrators, current student teachers, and former students. Only survey responses from current student teachers and former students were used for this study. Hence, only a subset of survey questions was deemed valid and reliable indicators of mentoring experience, confidence, program quality, and program characteristics. Refer to the appendix for the full set of questions in the original instrument.

Quantitative Results by Principal Components Analysis and Exploratory Factor Analysis

Principal components analysis (PCA) and exploratory factor analysis (EFA) were conducted in SPSS version 21. These methods determined appropriate subscales and removal of certain questions from the instrument. PCA was used first because there were a large number of items. Additionally, the principal axis method of EFA would not converge. After paring down the items, the analysis switched from PCA to EFA.

Prior to switching to EFA, 80 different items went into the initial PCA. However, many of these items turned out to have low communalities, which are indicators of how much variance the retained factors can explain in a specific item. Additionally, there were 19 eigenvalues greater than one. These eigenvalues resulted from the PCA and a scree plot suggested a minimum of 8 factors would be required to capture sufficient variability in the questions.

The PCA results indicated some questions should be removed from the instrument. Thus, all items with communalities less than .4 were dropped before running the PCA second time. After the second run there were again several items with communalities less than .4 -

55

these items were dropped as well. Following the second PCA, a number of items were also

dropped because they did not fit – this action allowed EFA using principal axis extraction to

be used.

Figure 6 shows the scree plot from the EFA after dropping the items in the first two

PCAs with low communalities. There were 10 eigenvalues from the EFA that were greater

than one. However, the plot shows a clear break after the fourth eigenvalue, with the plot

leveling out thereafter. Thus, a four-factor model was used to examine the construct validity

of the reduced instrument, with oblique (oblimin) rotation used to facilitate interpretation of

the loadings. The items' loadings appeared to line up with the expected concepts of

mentoring, confidence, quality, and characteristics. However, some items appeared in both

mentoring and confidence.
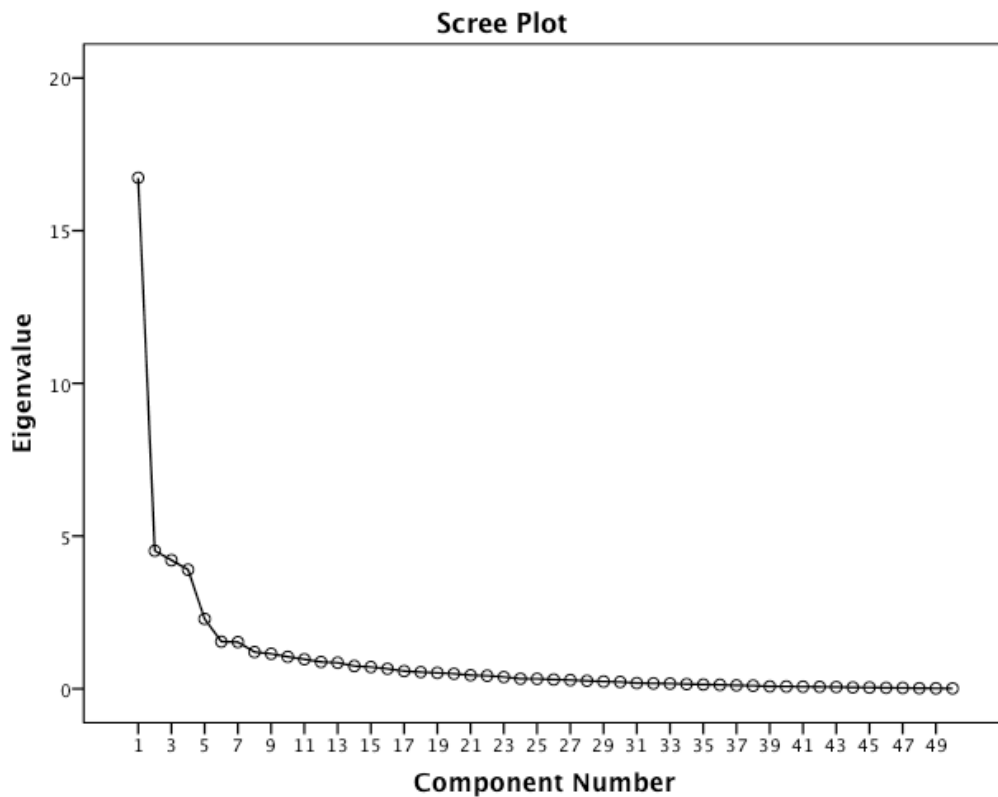
Figure 6: The scree plot from the Exploratory Factor Analysis (EFA).

The following five survey statements were specifically intended, a priori, to capture mentoring:

- My campus mentor teacher/cooperating teacher assisted me in finding useful materials and resources.

- My campus mentor teacher/cooperating teacher helped me solve problems as they arose.

- My campus mentor teacher/cooperating teacher provided me with frequent, helpful feedback and ideas.

- My campus mentor teacher/cooperating teacher was easily accessible.

- I had ample opportunities to practice a variety of instructional strategies.

Further, I anticipated taking these items out and fitting a three-factor model would yield loadings would cleanly line up on the other three dimensions of confidence, quality, and characteristics. Table 1 confirms the other dimensions of confidence, quality, and characteristics align with the other dimensions. The first column in the table names the subscale to which each item was assigned, the second column shows the question, and the remaining columns display loadings greater than .3. Only two items had loadings greater than .3 on more than one factor. The total variance explained by the individual items are 33.79% factor 1, the confidence scale, 9.37% for factor 2, the characteristics scale, and 9.15% for factor 3, the TEP quality subscale. These factors were assigned to the subscale for which they had the largest loading. More about the subscales follow.

Table 1

3 Factor Model after Dropping Mentoring Items

Scale		Factor		
		1	2	3
Confidence	Overall, my field experience opportunities adequately prepared me for entering a classroom as a first-year teacher.	0.313		
Confidence	My student teaching experience closely resembles the type of classroom (i.e., student demographics, location) in which I plan to teach.	0.469		
Confidence	My student teaching experience will help in facilitating a smooth transition to my first year of teaching.	0.561		
Confidence	Overall, my student teaching experience gave me the confidence to believe that I will be a successful teacher.	0.581		
Confidence	If I could start over, I would choose to complete student teaching instead of a teaching internship.	0.395		
Confidence	Establish and maintain effective classroom management	0.645		
Confidence	Develop strategies for working with parents and families	0.703		
Confidence	Recognize and respect individual family differences	0.716		
Confidence	Conduct parent/family-teacher conferences	0.645		
Confidence	Integrate multiple subject areas	0.56		
Confidence	Differentiate instruction for all students	0.615		
Confidence	Create a learning environment that encourages students to appreciate cultural diversity	0.737		
Confidence	Use a variety of instructional strategies to facilitate increased reading comprehension	0.734		
Confidence	Teach reading in my content area	0.796		
Confidence	Cultivate relationships with students	0.599		
Confidence	Maintain student engagement during instruction	0.736		
Confidence	Develop assessments that accurately reflect student learning	0.741		

Table 1 - Continued

		Factor		
Scale		1	2	3
Confidence	Use formative assessments to guide instruction	0.797		
Confidence	Use summative assessments to guide instruction	0.797		
Confidence	Facilitate small group instruction	0.563		
Confidence	Provide instruction aligned with the College and Career Readiness Standards (CCRS)	0.673		
Confidence	Provide instruction aligned with Texas Essential Knowledge and Skills (TEKS)	0.708		
Confidence	Provide instruction aligned with national teaching standards	0.754		
Characteristics	The legal and ethical obligation of general education teachers to participate in the Individualized Education Plan (IEP) process	0.304		0.453
Characteristics	Student growth and development			0.597
Characteristics	The use of resources for assessing and educating students with individual needs in the general education classroom	0.356		0.444
Characteristics	Program advisors/faculty in my teacher preparation program provided assistance in creating a résumé.			0.787
Characteristics	Program advisors/faculty in my teacher preparation program helped prepare me for job interviews.			0.744
Characteristics	My teacher preparation program offered information regarding career opportunities.			0.621
Characteristics	My teacher preparation program fostered collaboration among participants.			0.57
Characteristics	My teacher preparation program facilitated opportunities for me to collaborate with teachers in the field.			0.527
Characteristics	My teacher preparation program introduced me to professional organizations pertinent to my content area/field.			0.737

59

Table 1 - Continued

Scale		Factor 1	2	3
Characteristics	My teacher preparation program introduced me to research-based articles related to my content area/field.			0.524
Characteristics	Overall, my instructors were knowledgeable about the latest trends in curriculum and instruction.			0.67
Characteristics	Overall, my instructors were accessible.			0.682
Characteristics	Overall, my instructors seemed to care about me as an individual.			0.585
Characteristics	Overall, my instructors gave assignments that connected coursework with my field experiences.			0.573
Characteristics	Overall, my instructors used various forms of media (e.g., video conferencing tools, watching videos) to enhance my understanding of instructional concepts.			0.674
Quality	Teachers in my school work together to improve student learning.		0.755	
Quality	Teachers in my school trust each other.		0.745	
Quality	Teachers in my school use time together to discuss teaching and learning.		0.667	
Quality	Teachers in my school feel responsible to help each other do their best.		0.818	
Quality	Teachers in my school work especially hard with lower-achieving students.		0.612	
Quality	Teachers in my school try to help ALL students succeed.		0.713	
Quality	Teachers in my school continue to consider the instructional needs of a child, even when it seems that child does not want to learn.		0.599	

Extraction Method: Principal Axis Factoring.

Total Variance: Factor 1 – 33.79%, Factor 2 – 9.37%, Factor 3 – 9.15%.

Rotation Method: Oblimin with Kaiser Normalization.

Scales were constructed by taking the mean score across the constituent items. Reliability was assessed using Cronbach's alpha. The results showed highly reliable scales (Table 2). The mentoring scale yielded an alpha of .903. The confidence subscale yielded an alpha .951, while quality items yielded an alpha .881 and the characteristics items yielded an alpha of .919.

Table 2 also shows descriptive statistics for the whole sample and scales by student type. Current students score higher on average compared to former students on each of the dimensions. The mean score on the mentoring scale was 3.764 (SD = .356) for current students, while former student scored 3.369 (SD = .637). The mean score on the confidence scale was 3.455 (SD = .352) for current students, while former students scored 2.708 (SD = .566). On the quality scale, current students had a mean of 3.494 (SD = .458), while former students had a mean of 3.118 (SD = .501). Finally, current students scored higher on the characteristics scale (M = 3.327, SD = .413), while former students scored lower (M = 2.892, SD = .520) on the characteristics scale.

The next section describes descriptive statistics by student type. Means and standard deviations for current student teachers and former students are explained and illustrated in a series of tables. This section precedes the last section of the quantitative section entitled inferential statistics.

Table 2

Descriptive Statistics: Scales

	Current Students		Former Students		All Students		
	Mean	*SD*	Mean	*SD*	Mean	*SD*	*Alpha*
Mentoring Scale	3.764	0.356	3.369	0.637	3.418	0.622	0.903
Confidence Scale	3.455	0.352	2.708	0.566	2.800	0.596	0.951
TEP Quality Scale	3.494	0.458	3.118	0.501	3.166	0.509	0.881
Characteristics	3.327	0.413	2.892	0.520	2.947	0.526	0.919

Descriptive Statistics by Student Type

Tables 3-6 provide descriptive statistics (means and standard deviations) by current student teacher, former student, and for the whole sample. Means and standard deviations are provided for each of the items making up the four different subscales, (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics. Tables 3 – 6 provide analytical data in response to the first research question, "What are current student teacher and former student teacher perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics?" I explain each table in the following paragraphs.

Table 3 summarizes the items for the mentoring scale. Likert scale scores on each item ranged from one (Strongly Disagree or Not at all confident) to four (Strongly Agree or Extremely Confident). Responses have central tendencies on the higher end of the scale indicating agreement, strong agreement, confidence or strong confidence. The lowest average response was among former students for the item "I had ample opportunities to practice a variety of instructional strategies" (M = 3.19, SD = .812). Former students have lower average responses on every single item – the higher average scores for current students in Table 2 also relate to the outcome in Table 3.

Table 3

Descriptive Statistics: Mentoring Scale Items

Item	Current Students Mean	SD	Former Students Mean	SD	All Students Mean	SD
My campus mentor teacher/cooperating teacher assisted me in finding useful materials and resources.	3.64	.505	3.29	.780	3.33	.757
My campus mentor teacher/cooperating teacher helped me solve problems as they arose.	3.73	.467	3.39	.713	3.44	.694
My campus mentor teacher/cooperating teacher provided me with frequent, helpful feedback and ideas.	3.82	.405	3.45	.755	3.49	.729
My campus mentor teacher/cooperating teacher was easily accessible.	3.82	.405	3.55	.719	3.59	.691
I had ample opportunities to practice a variety of instructional strategies.	3.82	.405	3.19	.812	3.27	.798

Table 4 summarizes average responses on the confidence scale items. Again, the possible range of scores was from one (Not at all confident) to four (Extremely confident). The mean responses were once more towards the higher end of the scale; however, current student teachers had higher mean responses. The lowest mean score for current student teachers was 2.82 ($SD = .603$), which occurred for the item, establishing and maintaining effective classroom management. Most of the mean responses among former students were less than 3, indicating lower confidence in general. Again, this complements the total scale mean differences in Table 2.

Table   escribes esponses   e quality cale items. The range of responses was from one (Strongly Disagree) to four (Strongly). The means show most student types endorsed the higher end of the scale. The only mean less than 3 was for former students in response to the item, "Teachers in my school feel   esponsible   elp students do their best," $M = 2.99$, $SD = .688$). In every case, current students scored higher   han former students.

Table 4

Descriptive Statistics: Confidence Scale Items

Item	Current Students		Former Students		All Students	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
Overall, my field experience opportunities adequately prepared me for entering a classroom as a first-year teacher.	3.36	.505	2.90	.847	2.96	.824
My student teaching experience closely resembles the type of classroom (i.e., student demographics, location) in which I plan to teach.	3.27	.647	2.88	1.032	2.93	.998
My student teaching experience will help in facilitating a smooth transition to my first year of teaching.	3.82	.405	3.24	.862	3.31	.840
Overall, my student teaching experience gave me the confidence to believe that I will be a successful teacher.	3.73	.467	3.34	.805	3.39	.780
If I could start over, I would choose to complete student teaching instead of a teaching internship.	3.82	.405	3.25	.910	3.32	.880
Establish and maintain effective classroom management	2.82	.603	2.53	.849	2.56	.825
Develop strategies for working with parents and families	3.18	.751	2.35	.819	2.45	.853
Recognize and respect individual family differences	3.64	.505	2.86	.734	2.96	.752
Conduct parent/family-teacher conferences	3.27	.647	2.17	.828	2.30	.884
Integrate multiple subject areas	3.27	.647	2.40	.843	2.51	.868

Table 4 - Continued

Item	Current Students		Former Students		All Students	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
Differentiate instruction for all students	3.18	.751	2.44	.877	2.53	.893
Create a learning environment that encourages diversity students to appreciate cultural diversity	3.55	.522	2.58	.905	2.70	.922
Use a variety of instructional strategies to facilitate increased reading comprehension	3.45	.688	2.12	.911	2.28	.988
Teach reading in my content area	3.09	.539	2.05	.851	2.18	.886
Cultivate relationships with students	3.82	.405	3.33	.715	3.39	.701
Maintain student engagement during instruction	3.27	.467	2.84	.828	2.90	.803
Develop assessments that accurately reflect student learning	3.45	.688	2.82	.802	2.90	.812
Use formative assessments to instruction	3.55	.522	2.71	.776	2.82	.796
Use summative assessments to guide instruction	3.55	.522	2.85	.774	2.93	.780
Facilitate small group instruction	3.55	.522	2.77	.896	2.87	.894
Provide instruction aligned with the College and Career Readiness Standards (CCRS)	3.45	.688	2.34	.968	2.48	1.005
Provide instruction aligned with Texas Essential Knowledge and Skills (TEKS)	3.73	.467	3.04	.797	3.12	.795
Provide instruction aligned with national teaching standards	3.64	.505	2.53	.922	2.66	.953

Table 5

Descriptive Statistics: Quality Scale Items

Item	Current Students		Former Students		All Students	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
Teachers in my school work together to improve student learning.	3.73	.467	3.33	.622	3.38	.617
Teachers in my school trust each other.	3.64	.674	3.08	.636	3.15	.664
Teachers in my school use time together to discuss teaching and learning.	3.55	.522	3.17	.705	3.22	.693
Teachers in my school feel responsible to help each other do their best.	3.55	.522	2.99	.688	3.06	.692
Teachers in my school work especially hard with lower-achieving students.	3.45	.522	3.19	.608	3.22	.602
Teachers in my school try to help ALL students succeed.	3.45	.522	3.05	.655	3.10	.651
Teachers in my school continue to consider the instructional needs of a child, even when it seems that child does not want to learn.	3.09	.831	3.03	.677	3.03	.694

Finally, Table 6 describes the characteristics scale. Again, current student teachers have higher mean responses than the former students. This difference occurs for every one of the items. In general, these means indicate greater confidence or strong agreement, where the scale is from one (Strongly Disagree) to four (Strongly Agree). All but one of the items has a mean score above 3 for the current student teachers, while several are below 3 for the former students.

Current student teachers have higher scores on mentoring, confidence, quality, and the characteristics scale. Former students generally scored lower on these scales. However, the results are merely descriptive – they do not state whether or not they are large enough to be statistically significant. The next section presents data related to independent samples *t-tests*. Such analyses determine if the means are in fact significantly different.

Inferential Statistics

Independent sample *t-tests* were conducted on the samples of current student teacher and former student data. Figures 7 – 10 display boxplots for each of the scales by student status. A boxplot indicates the central tendency and distribution of a particular variable. The box in the plots displays the interquartile range of values (from the 25th to the 75th percentile), with the line in the middle of the box representing the median (the 50th percentile). The lines extending from the box cover the remaining range of the data up to 1.5 times the length of the interquartile range. Any dots representing observations beyond this distance may be considered outliers.

Table 6

Descriptive Statistics: Characteristics Scale Items

Item	Current Students Mean	SD	Former Students Mean	SD	All Students Mean	SD
The legal and ethical obligation of general education teachers to participate in the Individualized Education Plan (IEP)	3.36	.809	3.05	.862	3.09	.858
Student growth and development	3.36	.505	2.99	.702	3.03	.690
The use of resources for assessing and educating students with individual needs in the general education classroom	3.09	.539	2.83	.755	2.86	.734
Program advisors/faculty in my teacher preparation program provided assistance in creating a résumé.	2.91	.944	2.28	.858	2.36	.889
Program advisors/faculty in my teacher preparation program helped prepare me for job interviews.	3.18	.603	2.39	.896	2.49	.901
My teacher preparation program offered information regarding career opportunities.	3.36	.674	2.78	.793	2.85	.800
My teacher preparation program fostered collaboration among participants.	3.55	.522	3.24	.608	3.28	.604
My teacher preparation program facilitated opportunities for me to collaborate with teachers in the field.	3.27	.647	3.08	.669	3.10	.665
My teacher preparation program introduced me to professional organizations pertinent to my content are/field.	3.36	.674	2.77	.798	2.85	.805

Table 6 – Continued

Item	Current Students		Former Students		All Students	
	Mean	*SD*	Mean	Item	Mean	*SD*
My teacher preparation program introduced me to research-based articles related to my content area/field.	3.09	.701	2.70	.833	2.75	.824
Overall, my instructors were knowledgeable about the latest trends in curriculum and instruction.	3.36	.505	3.20	.589	3.22	.579
Overall, my instructors were accessible.	3.55	.522	3.14	.605	3.20	.607
Overall, my instructors seemed to care about me as an individual.	3.64	.505	3.07	.736	3.14	.734
Overall, my instructors gave assignments that connected coursework with my field experiences.	3.27	.467	2.95	.728	2.99	.707
Overall, my instructors used various forms of media (e.g., video conferencing tools, watching videos) to enhance my understanding of instructional concepts.	3.55	.522	2.92	.795	3.00	.792
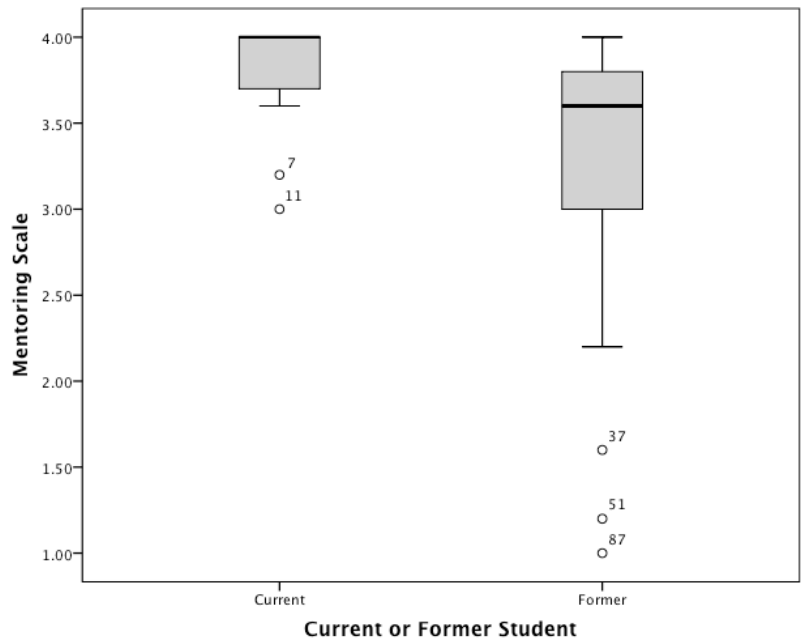
Figure 7: Boxplots for the mentoring scale by current and former students.
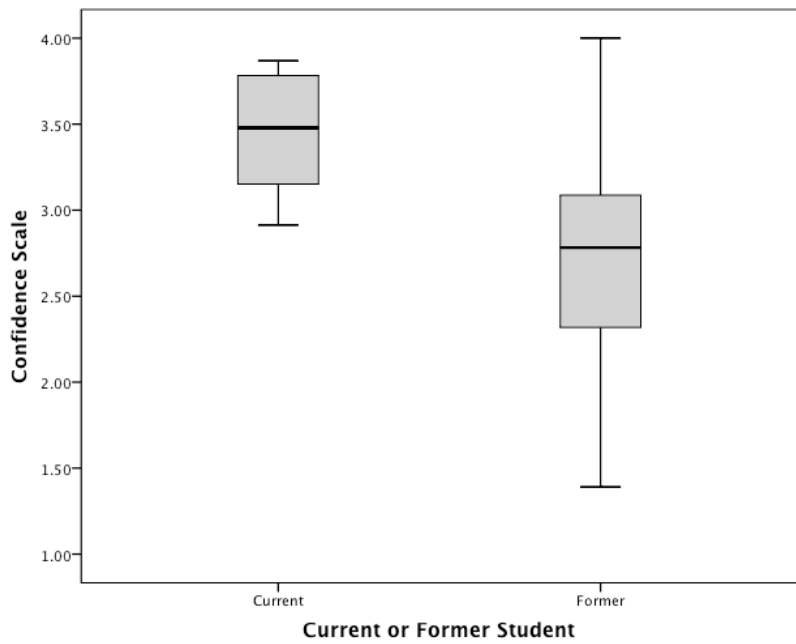
Figure 8: Boxplots for the confidence scale by current and former students.
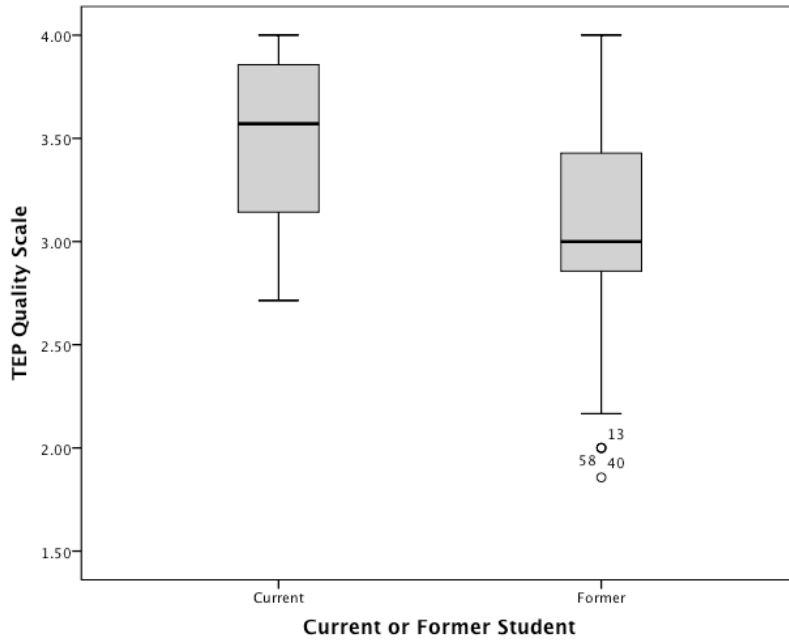
Figure 9: Boxplots for the TEP quality scale by current and former students.
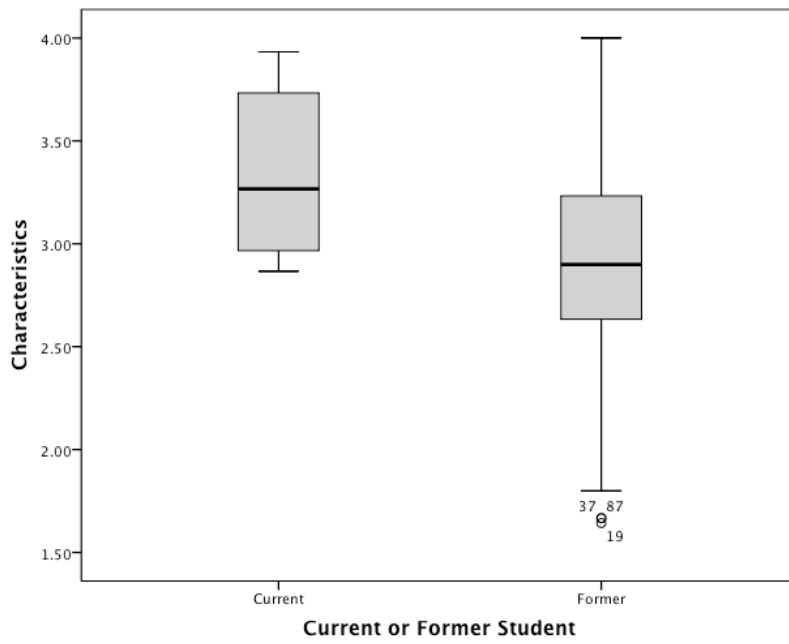
Figure 10: Boxplots for the characteristics scale by current and former students.

Each of the boxes reiterates the descriptive results from the previous section, with current student teachers scoring on average higher than former students for all four scales. Again, the four scales are mentoring, confidence, quality, and characteristics. While current student teachers scored higher on all four scales, another conclusion to be drawn from looking at the figures is that the range of values, or the variance, is generally smaller for current student teachers than former students data. It is important to note the sample of current student teachers is much smaller than the former students sample. Further, the assumption of equal variance for the traditional *t-test* is violated. However, SPSS (version 21), can report an adjusted version of the *t-test* that accounts for unequal variance between groups. Such results are summarized in Table 7.

The mean differences as depicted in Table 7 are significant at the .05-level for all four scales. The mean difference on the mentoring scale is .394 (*SE* = .129) and significant, *t* (87) = 3.051, *p* = .006. The mean difference on the confidence scale is .747 (*SE* = .124) and is also significant, *t* (87) = 6.028, *p* < .001. The mean difference on the quality scale is .375 (*SE* = .150) and is significant, *t* (84) = 2.506, *p* = .025. Finally, the mean difference on the characteristics scale is .435 (*SE* = .138), and is significant, *t* (85) = 3.153, *p* = .007. Hence, the observed differences – with current students scoring higher on each scale than former students – are significantly different from zero.

Table 7

t-tests between Current and Former Students

| | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
						Lower	Upper
Mentoring Scale	3.051	87	0.006	0.394	0.129	0.125	0.664
Confidence Scale	6.028	87	0.000	0.747	0.124	0.487	1.007
TEP Quality Scale	2.506	84	0.025	0.375	0.150	0.054	0.697
Characteristics	3.153	85	0.007	0.435	0.138	0.141	0.729

Qualitative Findings of Current and Former Participants

In this last section, I provide findings of content analyses for current student teacher and former student responses to open-ended survey questions. Current student teacher survey questions allowed collection of current student teacher data describing (a) helpful or relevant experiences during the teacher preparation program, (b) suggestions for changing or improving the program, and (c) additional information regarding the program. Former student open-ended survey questions allowed collection of data to describe (a) relevant teacher preparation program experiences needed for classroom teaching, (b) suggested changes or improvements to the teacher preparation program, and (c) additional information regarding the program. Together, these sets of open-ended survey questions provide data for the research question, What do current student teachers and former students perceive about their teacher education program? Additionally, the findings relate to quantitative data presented in the previous section.

Content Analysis Results of Current Student Teacher Responses

The qualitative data from current student teachers is organized by open-ended survey question. The survey questions describe (a) helpful or relevant experiences during the teacher preparation program, (b) suggestions for changing or improving the program, and (c) additional information regarding the program. Additionally, these statements title each following sub-section.

Helpful or relevant program experiences. In teacher preparation programs, pre-service teachers often participate in many experiences. Current student teachers of the aggieTEACH program (*n* = 11) provided perceptions about their program experiences by responding to open-ended survey questions. Four major categories (see Table 8) emerged

via content analysis of current student teacher responses. These four categories account for 85% of the total responses and are *student teaching* (35%), *field observations* (20%), *lesson planning* (15%), and *methods class* (15%). Additionally, statements in the *student teaching* category occur twice as often as statements in the *lesson planning* and *methods class* categories. Statements in the *field observation* category occur approximately half as frequently as statements in the *student teaching* category. All of the above categories emerged from statements related to helpful or relevant program experiences. Resulting emergent categories related to changes or improvements of the teacher preparation program follow.

        Suggestions for changing or improving the program. As current student teachers participate in programs, they often develop suggestions for changing or improving their experiences. For the sample of current student teacher responses, two major categories emerged (see Table 9). These major categories account for 72% of the total responses and are *contextual preparation* (52%) and *classroom experiences* (20%). Statements in the *contextual preparation* category occur nearly three times as often as *classroom experiences* statements. These statements indicate how current student teachers would improve or change the teacher preparation program. Resulting emergent categories about additional information regarding the program follow.

Table 8

Examples of categories defined from content analysis of current student responses that describe the most helpful or relevant classroom teaching experiences during their teacher education program

Categories	Definition	*n*	%	Examples
Student teaching	Pre-service teacher instruction of students while observed by a cooperating teacher	7	35	The class was extremely diverse. It helped me to learn what its like to teach a variety of students.
				Student teaching was by far the most helpful experience...
				Student teaching was the best part of my preparation program.
Field observations	Classroom visits with and observations of experienced teachers and their students	5	20	The observations, methods class, and lesson planning were the most helpful.
				It's important to observe good teachers…
				Any time you could get into the classroom to observe or assist was the most beneficial.
Lesson planning	Pre-defined direction for classroom experiences facilitated by a teacher	3	15	…it is the first time I got the opportunity to get in front of the classroom and try lessons I wrote.
				…lesson planning were the most helpful.
				I am so glad that I was able to write my own lesson plans and objectives prior to my student teaching semester.

Table 8 - Continued

Categories	Definition	*n*	%	Examples
Methods class	Undergraduate course in mathematics or science pedagogy	3	15	Any time in class you could talk to your fellow students or the instructor about your time in the classroom was also the most helpful.
				The…methods class…were the most helpful.
				I thought that observation times and hands on experience in my methods class proved to be the most help!
Receiving feedback	Critical discourse regarding pre-service teacher instruction	1	5	…its even more important to teach in front of them so that they can offer feedback to help you hone your skills.
Student advising	Assistance by advisors who give insight about program and teacher certification requirements	1	5	I found the required advising appointments extremely helpful, rather than just email after email.
Seminars	Pre-service teacher	1	5	I also found the mandatory meetings for aggieTEACH helpful because there was a guest speaker and the mentors asked questions and made
Total		20	100	

Table 9

Examples of categories defined from content analysis of current student responses about suggestions for changing or improving their teacher education program

Categories	Definition	*n*	%	Examples
Contextual preparation	Expansion and emphasis on real K-12 education practices, requirements, expectations, and occurrences	8	52	A course that concentrates on going over the different state requirements (ie: TEKS, etc) would have helped.
				Have more classes that work with preparing lessons and teaching them to peers.
				I would suggest making the coursework more focused...and the logistics of being a teacher, such as writing lesson plans or setting up a classroom management plan.
Classroom experiences	Classroom experience during field – based observations and student teaching	3	20	More classroom experience.
				That way, we had to have tried it out at least a few times before student teaching where we begin teaching full classes almost from the start.
				Make the observations as you get to junior and senior year more involved. They are currently at a kind of optional level of participation, and if you forced students to get up in front of the classroom it would really show them if it's what they want to do, or feel like they should be doing, and it will give them valuable experience.
Compatible field-based observation experiences	Pre-service teachers are assigned to school sites based on availability	1	7	Often times I was in a classroom where the subject was not in my content area. I really didn't enjoy being in a class in which I had no interest in the material.

Table 9 - Continued

Categories	Definition	*n*	%	Examples
Diversity education	Courses that encourage reflection about teaching and working across student populations	1	7	As it was, it seemed that the main focus of every single one of my education classes (besides Senior Methods) was multiculturalism and diversity in the classroom.
Discontinue education	Courses offered in a virtual format	1	7	Get rid of online classes.
Pedagogical preparation	Courses providing interactive experiences on *how* to teach	1	7	I would suggest making the coursework more focused on teaching strategies.
	Total	15	100	

Additional information regarding the program. As well as possessing ideas about helpful program experiences and suggestions for improving the program, current student teachers also possess additional information regarding their program. Three major categories of additional information regarding the program were also identified (see Table 10). These three categories accounted for 92% of the total responses and are *complimentary of student teaching* (46%), *complimentary of overall program* (23%) and *content methods courses* (23%). Statements in the *complimentary of student teaching* category occur twice as often as statements in the categories of *complimentary of overall program* and *content methods courses*. Unlike the results of current student teacher responses provided above, mentor teacher responses are about perceptions of the mentee or student teacher. Results for content analysis of mentor teacher responses follow.

Content Analysis Results of Former Student Responses

This final section includes results of content analyses of former student responses to three open-ended survey questions. These three questions provided former student data describing (a) relevant teacher preparation program experiences needed for classroom teaching, (b) suggested changes or improvements to the teacher preparation program, and (c) additional information regarding the program. Similar to the previous section for current student teachers, the survey statements for former student qualitative data title each following sub-section.

82

Table 10

Examples of categories defined from content analysis of current student responses about any additional information regarding their teacher education program

Categories	Definition	*n*	%	Examples
Complementary about student teaching	Comment about student teacher requirements	6	46	…and I got some good experience with my student teaching.
				I know that there is only so much you can learn from a textbook, and at some point you just have to jump into a classroom setting and get some firsthand experience.
				I learned more during my student teaching from trial and error than I could ever learn from a book.
Complementary about overall program	Comment about program	3	23	As a whole, I am pleased with my teacher preparation program.
				It prepared me to take and pass the certification exams, Overall it was ok,
Content methods courses	There is a secondary science methods class and a secondary mathematics class	3	23	…it just seemed to be preparing me for general education.
				There was only really one class I felt was specific to teaching Math.
				I think it would be more beneficial to better prepare specifically for what you are going to be doing.
Attitude about becoming a teacher	Comment about becoming a teacher	1	8	I entered the university as a chemical engineer major, but definitely do not regret switching to mathematics/education!
	Total	13	100	

Relevant program experiences for classroom teaching. Upon graduation and completion of teacher certification requirements, former students are likely to experience classroom teaching as the teacher of record. Former students of the aggieTEACH program (*n* = 78) provided perceptions about their program experiences by responding to open- ended survey questions. Four major categories (see Table 11) emerged via content analysis of former student responses. These four categories account for 81% of the total responses and are *student teaching* (43%), *field observations* (16%), *methods course* (12%), and *cooperating teacher assistance* (10%). Additionally, statements in the *student teaching* category occur nearly three times as often as statements in the *field observations* category. Statements in the *student teaching* category are nearly four times as frequent as statements in the *methods course* and *cooperating teacher assistance* categories. Similar to the current student statements, all of the above categories emerge from statements related to perceptions of relevant program experiences. Resulting emergent categories suggesting changes or improvements to the program follow.

Table 11

Examples of categories defined from content analysis of former student responses about teacher education program experiences believed to provide the most relevant information needed for classroom teaching

Categories	Definition	*n*	*%*	Examples
Student Teaching	Pre-service teacher instruction of students while observed by a cooperating teacher	45	43	My student teaching experience was the most valuable experience that I had while in the aggieTeach program…I felt that my student teaching allowed me to experience all aspects of being a teacher.
				Student teaching was the most relevant experience I had, yet even it does not fully prepare one for being a teacher…Only actually teaching can give you those experiences and the wisdom that comes with them.
				The most informative part of being in the education program was student teaching. I read the books and did the classwork at A & M in my teaching prep courses, but nothing prepares you for teaching except really doing it.
				I learned more about classroom management in 12 weeks of student teaching than in all of my coursework combined. It was an excellent opportunity to learn and make mistakes under the mentorship of a classroom teacher;…

Table 11 - Continued

Categories	Definition	*n*	%	Examples
Field Observations	Classroom visits with and observations of experienced teachers and their students	17	16	Being in real-life classrooms! Seeing how teachers react and respond to little disturbances, how they organize their room and their time, observe their creative activities.
				Classroom observations in my field of study. Observing other courses such as biology or chemistry allowed me to observe students and teachers, but did not help as much with learning to teach content.
				My experiences observing and working with classroom teachers during my four years of teacher preparation helped me be realistic about what to expect in my own classroom. The variety of classes that I observed (Pre-Algebra through BC Calculus) allowed me to see how the same teacher can relate to various groups of students and still meet their learning needs.

Table 11 - Continued

Categories	Definition	*n*	%	Examples
Methods Course	Undergraduate course in mathematics or science pedagogy	13	12	My methods class was the first class that I truly felt I was learning something beneficial for my future in teaching… This was also the first time anyone showed us what a SPED folder looked like. Or how to break the TEKS down into what we need to be teaching.
				The very last…Methods course you take that prepares you for student teaching. Without this class, I would have failed instantly. This is the first class where I had the opportunity to teach in front of a class (or my peers) and it gave me an idea of what having my own classroom would be like.
				My "methods" class during my last semester at A&M provided me with a great deal of useful information for my future job. We created specific lesson plans for high school mathematics, used current technology like a SmartBoard, and taught lessons to our fellow classmates. Overall, I feel that it helped make the connection to the realities of teaching more than any of my other education classes.

Table 11 - Continued

Categories	Definition	*n*	%	Examples
Cooperating teacher assistance	Observations, feedback, and school contextualized interventions by cooperating teachers during pre-service teacher student teaching	11	10	…where my mentor teacher and the group I worked with at that school were just a great team. Activities/lessons were organized, teachers worked and shared laboratories, talked about different teaching strategies, different ways to implement activities. And had an outlined calendar of lessons and units. Having access to their curriculum and electronic resources really helped.
				My cooperating teacher handed me the reins early and gave me valuable feedback on a regular basis. It was a great experience.
				My mentor teacher oversaw the Algebra I program at the campus and specialized in supporting struggling learners. She taught me to support these students in the classroom.
				My mentor at [ABC] High School was AMAZING! She helping [*sic*] me not only improve how I taught, but what I taught. She showed me ways to communicate with students in a way that made it easier for them to learn.
Teacher educator assistance	Instruction and pedagogical interventions by teacher educators during pre-service teacher education	5	5	The teacher[, Ms. Jane Doe,] was awesome, the class was very useful and the observations were invaluable.
				My instructor took the time necessary to make sure we learned the information we needed.
				…[The instructor] was shocked at how little our class knew about teaching (which was pretty accurate!) so she taught us specific real world things we needed to know, not the boring theoretical methods we learned in the non-content-specific classes.

Table 11 - Continued

Categories	Definition	*n*	%	Examples
Special Education/Populations Course	Special population pedagogical instruction	2	2	Even though I do not use a lot of the information in my current school, the course on dealing with special populations was very eye opening. It helped develop sensitivity to various situations and was very informative.
				…course on special education
Other teacher preparation program	Teacher preparation beyond undergraduate teacher education and certification	2	2	After graduation, I took a one year seminar from [DEF] University the first year I taught for graduate credit. It was called Research [*sic*] strategies for teachers. I had a mentor that came into my classroom and made suggestions. We also learned to write classroom procedures. This was the most benefitial [*sic*] class I took.
				I think I 89earned [*sic*] more from Toastmasters about teaching, than I did from all my teaching classes. I learned about laws and culture and lesson plans in my teaching classes, but I actually learned how to teach elsewhere.
Micro-teaching	Simulated K – 12 instruction with peer pre-service teachers	2	2	Additionally, teaching lessons to our peers helped greatly, as our own peers are much more critical than any student!
				I had the opportunity to teach in front of a class (or my peers) and it gave me an idea of what having my own classroom would be like.
First Year of Teaching	K – 12 instruction after completion of all teacher certification and education requirements	2	2	My first few years of teaching helped me the most in my preparation for becoming the teacher that I am today. I dealt with many difficulties and behavior problems. I taught multiple inclusion classes.
				…my first year in the classroom.
Practitioner conference attendance	Attendance of professional organizational meetings for in-service teachers	1	1	…attending the [Conference for the Advancement of Science Teaching] conference

89

Table 11 - Continued

Categories	Definition	*n*	%	Examples
Volunteering in a school	Unpaid work in K – 12 schools to gain experience with children and teaching	1	1	Before student teaching, we were told to work closely with a local group of kids for a semester...I helped with the [ABC High School dance] team. Working with those girls so closely opened my eyes to the difficulty in working with teens, and how to build healthy student-teacher relationships.
Diversity education	Courses about teaching and working across student populations	1	1	[Diversity education courses] provided me with some of the best information for teaching all my students.
Technology integration	Use of technology in the classroom	1	1	All my experiences with technology! I have taught for the last four years…Every year I have had access to LCD projectors and Elmos (or some form of document camera). However, I have never been in a classroom with a SmartBoard, and I spent a lot of time at A&M learning to be proficient using one, so I feel like that was not as beneficial as it could have been. Three of the four years I had access to Geometer Sketchpad software, but it was not widely used in my departments.
Content Courses	Courses to increase understanding of academic concepts, facts, theories and skills in mathematics and science (e.g. Algebra and Physics)	1	1	…Content area classes…
Action research course	Teacher conducted research in the K – 12 classroom setting	1	1	…individual research
Total		105	100	

Suggestions for changing or improving the program. As many former students experience their first year as an in-service teacher, they often develop suggestions for changing or improving their pre-service experiences. For the sample of former student responses, one major category and a second cluster of semi-major categories emerged (see Table 12). The major category accounted for 34% of the total responses and is *school contextualized experiences*. Statements in this category occurred from 3 – 7 times as often as statements in the next cluster of major categories. The cluster of categories accounted for 24% of the total responses and include *course relevancy with school contexts* (9%), *special population education* (8%), and *provide curricula exemplars* (7%). While the percentage of statements categorized as *school contextualized experiences* greatly exceeded the remaining categories, all statements in the categories indicate how former students would change or improve the teacher preparation program. Resulting emergent categories about additional information regarding the program follow.

Table 12

Examples of categories defined from content analysis of former teacher suggestions for changing or improving their teacher education program

Categories	Definition	*n*	%	Examples
School contextualized experiences	Emphasis on real K – 12 education practices, requirements, expectations and occurrences	31	34	I think more time should be spent showing teachers how to communicate with parents, how laws pertaining to the school environment (special ed, teacher/student interactions, etc) will affect them, and how they can interact with other teachers… It would have been helpful to have some group discussion about how to work with experienced teachers...
				I also could have benefitted in my teaching program by learning from experienced teachers how to improve time management.
				There was really no courses that taught how teachers could handle lesson planning for TAKS or now the End of Course exams.
Course relevancy with school contexts	Level of applicability of course content to K – 12 school setting	8	9	Much of the information my "teacher preparation" classes was completely irrelevant or simply so idealistic that it was impractical.
				More work actual class work related to actually teaching for example paperwork or procedures around different policies!
				I think some of the ideas that are taught in the program are good ideas, but are not applicable to some of the classrooms.

Table 12 - Continued

Categories	Definition	*n*	%	Examples
Special population education	Information about teaching students with learning and physical disabilities	7	8	I feel like I was underprepared for the challenges of teaching ESL students. I was able to observe a classroom that was mostly comprised with ESL students, but I wish that I had more time to work with that classroom….there is a high population of ESL students at the school that I teach at.
				I would recommend more courses that focus on teaching students with disabilities. Also, familiarizing teachers on special education laws.
				There needs to be more focus on teaching ELL and special populations at the secondary level.
Provide curricula exemplars	Examples of state and commercially produced curricula and standards	6	7	Also, reading classes never use math as an example. They always use science and lump that with math. I would like examples or how we should integrate reading in math.
				I definitely feel students in the teacher preparation program should get access to a sample curriculum in their area. I feel if I would've had a sample curriculum of the way things are taught, the order things are taught, in my subject area, it might've been easy to prepare for the full-time job.
				If we had seen a sample curriculum before student teaching, I feel I would've entered with much more confidence and left with greater confidence.

Table 12 - Continued

Categories	Definition	*n*	*%*	Examples
Teacher educator qualifications	Years of and proficiency at K – 12 teaching	5	5	I would recommend requiring all education profs to continue teaching in some form at the secondary level, just to keep them from losing touch with the reality of what we are trying to do as high school (not college) teachers.
				It seemed as though some of my professors did not remember what it was to teach in the classroom. Some of the assignments I have given I've never used outside of that course.
				Having professors who have been outside of the classroom for more then a decade is not beneficial. The classroom environment changes so quickly, and the standards from the state change so quickly that the information they share from research that they have completed is quickly irrelevant.
Diversity education	Courses that encourage reflection about teaching and working across student populations	5	5	There needs to be a class on teaching in different socioeconomic school districts explaining the differences with studies to back up assertions.
				More time in low income schools…The school that I now teach at is very low income, high minority and my student teaching experience at [ABC School] did not prepare me for the kinds of students that I now teach.
				I wish that I could have had more experiences working with the highly diverse populations that I ended up teaching.

Table 12 - Continued

Categories	Definition	*n*	%	Examples
Pedagogical preparation	Courses providing interactive experience on *how* to teach	5	5	Possibly look into more teaching methods.
				Student teachers need more instruction on backward design - begin with the standards, assessment, then instruction.
				Also, provide courses that don't just teach you math but teach you how to teach MATH, not just general teaching strategies.
				I feel that you should have a class for science majors on how to manage students in a big lab setting because it is scary the first time without help.
Field observation requirements	Parameters for guiding completion of field observations	5	5	Future teachers need to have a more active role in the classrooms when they are observing.
				Each field study should have a required number of lessons to teach.
				In the classroom observations, it would have been helpful to move around to more different classrooms. There were times when I was assigned to observe a teacher every week for a 3 hour period, and I saw the exact same lesson 3 times every week. It would have been more useful to see 3 teachers for 1 hour to get more variety in teaching style and see different lessons.

Table 12 - Continued

Categories	Definition	*n*	*%*	Examples
Cooperating teacher selection	Years of and proficiency at K – 12 teaching	3	3	Also, when choosing mentor teachers make sure that they have more than 10 yrs experience and not teaching more than two subjects.
				I feel that student teaching would have been more effective if I had a mentor teacher that was interested in teaching me instead of having me run copies and grade the tons of homework she assigned.
				Better screen the cooperating teachers for student teaching.
Subject specific experiences	Secondary science methods class and secondary mathematics methods class	3	3	I wish that I had had more of a chance to connect and observe Computer Science teachers in action during my field experiences.
				Focus more on math education. I felt that because I was a math major that the education part was just secondary….
				Create a senior methods course for Mathematics students that is relevant in regards to curriculum (TEKS, TAKS, STAAR, EOC, etc...)
Complimentary of overall program	Comment about the teacher preparation program	3	3	Overall, it was a very positive experience.
				No changes needed.
				Very little should be changed, I felt I had a wonderful experience.

Table 12 - Continued

Categories	Definition	*n*	%	Examples
Student teaching requirements	Parameters for guiding completion of student teaching	2	2	I didn't have very much time with kids…I would have liked to have more time working with students.
				Give students more opportunities to actually teach a lesson plan that they wrote...I wrote a lot of lesson plans, but nothing compares to actually standing up in front of a classroom for 45 minutes and trying to follow a lesson plan that you wrote.
Education course requirements	Parameters for guiding completion of education course requirements	2	2	It was frustrating when I was required to have 45 classroom observation hours a semester in multiple classes and could not overlap. There were a few semesters I had to be in a school 6 hours a week, in addition to my normal course load and work.
				There were too many required hours when I graduated. Some of them were very repetitive. I also think you should be able to graduate with a master if that many hours were required.
Distance education	Courses offered in a virtual format	1	1	To make the online required class cater more to helping teachers and not feeling like a burden while they are in their first year of teaching…
Programmatic communication	Program sponsored emails, memos, telephone calls, and meetings between program participants, educators, and staff	1	1	Create more contact between classroom teachers and the training program.
Technology integration	Use of technology in the classroom	1	1	I would suggest more technology-based classes.

Table 12 - Continued

Categories	Definition	*n*	%	Examples
Pre-state certification exam advising	Academic advising	1	1	I would suggest a more open line of communication between student teachers and program supervisors. I was completely lost when it came to fingerprinting, signing up for exams, preparing for exams, etc.
Cohort model	Admitting and matriculating groups of students	1	1	Smaller class sizes or more course offerings. Some sort of program where the same students will move to different levels of preparedness with each other and a specific mentor.
Educational research knowledge	Discussion about interpreting results from educational research studies	1	1	There needs to be more delving into case studies and determining how they obtained their data and what that data means.
	Total	91	100	

Additional information regarding the program. After sharing ideas about relevant program experiences and suggestions for improving the program, former students also shared additional information regarding their program. Five major categories of additional information regarding the program were identified (see Table 13). These five categories accounted for 76% of the total responses and are *complimentary of overall program* (28%), *school contextualized experiences* (15%) *complimentary of student teaching* (13%), *teacher educator qualifications* (10%) and *degree plan requirements and courses* (10%). Statements in the *complimentary of overall program* category occurred nearly twice as often as statements in the *school contextualized experiences* and *complimentary of student teaching categories*. Additionally, statements in the *teacher educator qualifications* and *degree plan requirements* categories occurred 6 times less than statements in the *complimentary of overall program* category. These results provide additional former student statements about the program; they are a collection of statements, which former students wanted to mention in addition to perceptions of relevant program experiences and suggestions or improvements to the program.

The last section of this chapter is called Summary of Chapter Four. Brief paragraphs summarize the results from the quantitative and qualitative chapters. The summary precedes chapter 5, which contains the discussion, implications, and summary of the study.

Table 13

Examples of categories defined from content analysis of former student responses about additional information regarding their teacher education program

Categories	Definition	*n*	*%*	Examples
Complimentary of overall program	Comment about the teacher education program	11	28	I would recommend this program to anybody who wants to be a teacher.
				In comparison to my colleagues who went through alternative certification, my struggles have [been] smaller and less severe. I was ready…to make my classroom my own from the moment I entered it. I needed my experiences that I received in my education program.
				I highly recommend the AggieTEACH program. I have met several other STEM teachers at the schools where I've worked, and none of them have discussed a teacher preparation program that sounds anything like the one at A&M.
School contextualized experiences	Understanding of real K – 12 education practices, requirements, expectations, and occurrences.	6	15	I would have preferred more hours in the classroom and also learning different methods of how to motivate students.
				It would be helpful for many student-teachers to be given a better selection of schools.
				I mentioned I had to do my student teaching twice…I could have suceeded [*sic*] the first time if I didn't have three subjects to teach and wasn't floating.
				I wish I was better prepared for the real classroom. I did not have enough time to plan/experiment classroom management.
Complimentary of student teaching	Comment about student teacher requirements	5	13	Although I do not feel I was entirely prepared [*sic*] I do feel my…student teaching experiences was way more effective then [*sic*] emergency certification teachers…
				I am very thankful that I had such an enjoyable and educational experience during my student teaching,…
				Most of the amazing experiences will be from student teaching.

Table 13 - Continued

Categories	Definition	*n*	*%*	Examples
Teacher educator qualifications	Educators of pre-service teachers	4	10	I also feel that more time should be spent listening to teachers who are actively teaching,…
				The university professor we had tried hard but did not have a true reality with the teaching/coaching world. The field trips we had to take to "diverse schools" were not really diverse schools in real life [*sic*] which was misleading.
				…my mentor teacher or university advisor that was a retired elementary teacher. I think if you are getting observed by someone [*sic*] it should be from someone that has taught in that grade level because I would not really know how to handle a situation or be able to help someone from an elementary school level.
Degree plan requirements and courses	Course sequences and selection for teacher education	4	10	I think there should be a better way to become a math teacher besides majoring in Math and minoring in education.
				I really have very little in common with an elementary school teacher, but was placed with them for the majority of my educational classes as if we were preparing to do basically the same thing.
				I felt like I spent a lot of time learning math that I won't use and not enough time learning how to manage a classroom.
Complimentary of courses	Comment about teacher education courses	2	7	I am very thankful for the divirse [*sic*] range of classes that I was able to take in the AggieTeach program.
				In all honesty, the main part of my teacher program that was beneficial was my methods class with [my instructor], as it was subject specific.
Complimentary of introductory field experiences	Comment about introductory field experience requirements	2	4	My teacher preparation program was good because we had many opportunities to visit real classrooms, and I also happened to get put into classrooms with good educators.
				The scaffolding process of observing before student teaching was important.

Table 13 - Continued

Categories	Definition	*n*	*%*	Examples
Additions to programming	Additional programmatic offerings to enhance teacher education	3	4	I think creating a network of new teachers would be nice. When you are in your first year, its good to be able to link and discuss with other teachers in a safe and quick format, like a discussion board or chat room. It would have been great to be able to get on and…see if anyone has any suggestions for simple problems.
				I feel I learned far more from the internship than I would have through student teaching.
				The collaboration among my mentor teacher and other interns taught me so much and made me the amazing, passionate teacher I am today.
Complimentary of teacher educators	Comment about teacher educators	1	3	I had great professors. I am comfortable contacting them for advice.
Complimentary of student advisor	Comment about student advisor	1	3	…my advisor…was absolutely incredible, and played a pivotal role in my college career. The importance of having [*sic*] involved advisor cannot be understated!
Experiences with technology	Comment about the integration of technology in the classroom	1	3	I went through the program prior to the integration of current technology in the classroom. I hope current student teachers have the opportunity to integrate technology such as interactive whiteboards, etc. in their lessons.
	Total	40	100	

Summary of Chapter Four

This study has two participant groups, current student teachers (n=11) and former students (n=78) from one program called, aggieTEACH, a traditional, early field experience, and baccalaureate secondary mathematics and science teacher education program. The population sample in this study consisted of 77.5% (n = 69) female, 21.3% (n = 19) male and 1.1% (n = 1) particpants; additionally, 80.9% (n = 72) identify as white or Caucasian, 9% (n = 8) identify as Hispanic, 7.8% (n = 7) identifying as African American, Asian, or other, and 2.2% (n = 2) decided not to disclose their race.

This mixed methods study reveals aggieTEACH participant's agreement and confidence levels in scales called mentoring, confidence, TEP quality, and program characteristics. I used principal components analysis (PCA) and exploratory factor analysis (EFA), to generate the scales. Content analysis revealed emergent themes about mentoring, field experiences, and contextualized learning practices.

Results of the EFA indicate significant differences between current student teacher and former student participants' agreement and confidence levels about the teacher education program characteristics and experiences. The mentoring scale yielded an alpha of .903. The confidence subscale yielded an alpha .951. The quality items yielded an alpha .881 and the characteristics items yielded an alpha of .919. Significant differences occurred between current student teacher and former student participants' agreement and confidence levels about the teacher education program characteristics and experiences. Current student teachers scored higher on average and have less variability to former students on (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics scales. Lastly, both current

student teachers and former students identified student teaching and field observations as the most helpful or relevant component of their teacher education program experiences.

Findings of the content analysis allowed several themes to emerge. Such themes emerged about current student teachers' perceptions about helpful or relevant program experiences, suggestions for changing or improving the program, and additional information regarding the program. Content analysis of former students' perceptions also revealed relevant program experiences for classroom teaching, and suggestions for changing or improving the program.

The last chapter in this dissertation is called Chapter 5 Discussion, Implications, and Summary. The discussion sections present why the quantitative and qualitative analysis yielded such results and findings. The implication section details how the study impacts teacher education programs, current literature, and future research. A summary of the entire study concludes chapter 5 and this dissertation.

CHAPTER V

DISCUSSION, IMPLICATIONS, AND SUMMARY

This chapter has 3 major sections. The first section includes a discussion about the quantitative results and qualitative findings presented in chapter 4. The next section indicates implications for current literature, teacher education programs, and future research. The final section summarizes the dissertation. Results and findings in the discussion section refer to the following research questions:

1. What are current student teacher and former student teacher perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics?

2. Are there significant differences between current and student teachers and former student teachers on their perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics?

3. What do current student teachers and former students perceive about their teacher education program?

Discussion of Quantitative Results

Chapter 4 presented the quantitative results followed by the qualitative findings. Hence, this discussion section mimics that format.

The quantitative results describe aggieTEACH current student teachers and former student participants' perceptions of (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics. Current student teachers and former students were surveyed about their perceptions of aggieTEACH, a mathematics and science teacher education program. The scales described by the quantitative results are as follows:

- Mentoring refers to participant interaction with an assigned, TEP vetted, site-based teacher who assists the participant in gaining K-12 classroom field experience

- Confidence is a TEP participant's personal belief about their ability to successfully complete or demonstrate a practice or concept in an education setting (Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998)

- TEP quality indicates participant perceptions of their educational experiences during TEP experiences

- Program characteristics references particular experiences aligned with accreditation requirements and researched-based best practices

The participant demographics in this study resemble the current national landscape of teacher candidates and in-service teachers (American Association of State Colleges and Universities, 2005; Brownstein, Allan, Hagevik, Shane, & Veal, 2009; Lampert, 2010; Sykes, Bird, & Kennedy, 2010; Whitney, Golez, & Nagel, 2002). Of the 11 current student teachers and 78 former student participants, primarily 80.9% (n = 72) identify as white, 9% (n = 8) identify as Hispanic, and the remainder identify as African American, Asian, or other. Contrary to the demographic percentages, the actual participant numbers are small for this study. Hence, the resulting discussion and implications of research highlights the need to increase the number of participants, which could create different outcomes.

Quantitative Results by Research Questions

This study focuses on current student teacher and former student perceptions of their science and mathematics teacher education program called aggieTEACH. The aggieTEACH program certifies science and mathematics teachers to teach in Texas. The purpose of this dissertation is to present an understanding of teacher education program quality via current

106

and former student teacher perceptions. Specifically, this mixed methods study investigates current and former student teachers' perceptions of mentoring, confidence, TEP quality, and program characteristics.

All aggieTEACH stakeholders were given surveys that described their TEP experiences and characteristics. These aggieTEACH stakeholders included current student teachers, former students, administrators, current student teacher mentors, and teacher educators. Only survey responses from current student teachers and former students were used for this study. Data from the current student teachers and former students allowed for direct comparison across similar perspectives – these participants could provide insight about mentoring experiences, confidence in teaching, program quality, and program characteristics. All other participant categories were beyond the scope of this study.

Data from current student teachers and former students underwent principal components analysis (PCA) and exploratory factor analysis (EFA) in SPSS version 21. Eight factors were isolated and four scales resulted which are called Mentoring, Confidence, TEP Quality, and Program characteristics. A discussion about these scales follows.

Mentoring Scale

Both current student teachers and former students provided data about their mentoring experience. This scale had the highest mean from current student teachers and the combined group of participants. This may have occurred because participants had frequent interactions with their mentors and classes of K-12 students and the student teaching experience is the last major program requirement before graduation.

The student teaching segment of the aggieTEACH education program requires frequent interaction with a mentor and the mentor's classes of K-12 students for several

weeks (Scott, Milam, Stuessy, Blount, & Bentz, 2006). These interactions happen almost daily and consist of student-teacher interactions, meetings with teachers and/or administrators, and feedback from a variety of school-based stakeholders. Current student teachers also plan lessons, reflect about their teaching experiences and discuss these reflections with their mentors.

While student teaching happens almost daily, the student teaching experience typically occurs as the last major requirement before completion of the aggieTEACH program. Prior semesters in the program focus student education and training on instructional methods and strategies, pedagogy, and theories of teaching, learning, and culture. Student participation in student teaching allows application of methods, strategies and theories in a K-12 classroom under the watchful eye of a mentor teacher.

Current student teachers received the survey for this study during their student teaching experience, the last semester before graduation. On the other hand, former students, who had graduated from the university program at varying times, received the survey as current employees of K-12 school districts. While current student teachers likely recalled more recent memories of their experiences for the survey, former students may not have been able to remember as many experiences about their student teaching experiences. However, both participant groups' responses indicate strong agreement with the positive statements about mentors, where mentors should remain an integral component of the student teaching experience.

As mentoring is an integral component of the aggieTEACH program, so is development of teacher confidence. Participant data resulted in alignment of certain tasks with a confidence scale; a discussion of tasks that require confidence appears below.

Confidence Scale

Teachers interact with their colleagues, administrators, parents, and students daily. Such interactions might entail teaching, parent conferences, pre/post-observation conferences with school administrators, lesson planning meetings with other teachers or administrators and a slue of other interactions. Within each of these encounters, confidence in obtaining a desired positive outcome is greatly increased if teachers have been trained on the interaction prior to initial execution in a real world setting(Champion, 2010; Chou, 2010; Miller & Stayton, 2006; Samimi-Duncan, Duncan, & Lancaster, 2010). The confidence scale highlights those expected interactions which aggieTEACH prepares its participants.

The highest participant rated interactions (or teacher education program characteristics) are cultivating relationships with students and the general belief that a smooth transition into teaching will occur because of the student teaching experience. These beliefs were held mainly by current student teachers while former students generally scored all program characteristics as resulting in lower levels of confidence. These outcomes are common and prior research provides some rationale for them.

Congruent with current literature, the current student teacher participant data indicates generally higher confidence levels than their more experienced counter parts (Justice, Greiner, & Anderson, 2003; Loewenberg-Ball & Williamson-McDiarmid, 1989; Loewenberg-Ball, Thueule-Lubienski, & Spangler-Mewborn, 2001; Loewenberg-Ball, Thames, & Phelps, 2008; Martin & Russell, 2009). Their confidence may result from feelings of preparedness by their teacher education program(Lampert, 2010; Loewenberg-Ball & Williamson-McDiarmid, 1989; Loewenberg-Ball, Thames, & Phelps, 2008; Sykes, Bird, & Kennedy, 2010; Zeichner, 2010b). Former students may have lower feelings of

confidence because they no longer implement or trust the strategies and ideas taught while they were becoming certified.

Classroom experiences, district training, and conversations with other school personnel may cause low confidence in former aggieTEACH students; in short, their job experiences may decrease their confidence. Decreased confidence after employment as a teacher is not uncommon (Bandura, 1977; Cantrell, Young, & Moore, 2003; Cepni, 1993; Champion, 2010; Justice, Greiner, & Anderson, 2003; Stamopoulos, 2006; Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998) and future research should focus on how to help new teachers retain their confidence after leaving their TEP.

TEP Quality Scale

In the TEP quality scale, current student teachers and former students rated their agreement with statements about their campus assignment for student teaching. While current student teachers rated their campuses highly, former students rated their student teaching campus at a lower level. The difference is likely because of memory and/or former student inability to disconnect current job site characteristics from student teaching campus characteristics. Current student teachers were teaching at campuses that were the subject of the survey when submitted their responses; former students, who might have changed job sites or taught for several years, had to remember their student teaching site. Therefore responses to the survey varied in reliability.

Favorable results about campus assignment characteristics from current student teachers occur in the literature (Alvis-Rhea, 2001; Boyd et al., 2008; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Burstein, Czech, Kretschmer, Lombardi, & Smith, 2009; Clift & Brady, 2005; Coffey, 2010; Dean, Lauer, & Urquhart, 2005). However, the present

study departs from the literature by asking former students to recall their student teaching campus characteristics without raising the following questions: How many years have you taught after your student teaching experience? Is your current campus the same campus you had your student teaching experience? How many campuses have you taught at after your student teaching campus? Posing these questions insure reliability of the TEP quality scale. Without these questions, former student responses could be characterized as being influenced by several factors. Such factors include having teaching or professional development experiences on one or more campuses that may have occurred upon graduation from the teacher education program.

Program Characteristics

The program characteristics scale comprises positive statements about TEP characteristics and intended experiences. Level of participant agreement with the presence of certain TEP characteristics and opportunities/experiences creates the scale. Similar to the previous scales, current student teachers rated all statements higher than their former student counterparts. The following paragraph discusses why the higher averages occurred for the program characteristics scale.

There were fewer current student teacher participants than former student participants. The different population sizes resulted in higher averages from current student teachers – a smaller population allows for a higher concentration of responses and/or big shifts in means from single responses. Higher averages may also occur because current student teachers had not graduated and were still participants of the program. Current student teachers may have felt compelled to answer positively for fear of jeopardizing their standing;

however, individual participant responses were anonymous. Moreover, there were no survey items that requested unique, participant identifying responses.

In summary, current student teachers scored higher on average compared to former students on each of the scales – they have higher scores on mentoring, confidence, TEP Quality, and the Program characteristics scales. A discussion of the inferential statistics related to these scales follows. Discussion about how current student teacher and former student responses are significantly different also occurs.

Inferential Statistics

Independent sample *t-tests* were conducted on the samples of current student teacher and former student data. Current student teachers scored, on average, higher than former students for all four scales; the variance is generally smaller for current student teacher than former student data, as there were a small number of current student teacher respondents. The mean differences are significant at the .05-level for all four scales from zero, with current students scoring higher on each scale than former students. A discussion of the significant differences occurring in each scale called Mentoring, Confidence, TEP Quality, and Program characteristics follows.

Mentoring Scale

Current student teacher responses on the mentoring scale are significantly different than former student responses. The difference may be attributed to several reasons. The first reason may be the current student teacher sample had fewer respondents than the former student sample – thereby highlighting any close commonality of data by current student teacher respondents. The second reason may be the current student teacher group experienced mentoring during the semester in which the survey was administered; their

112

memories of their mentors may have been clearer. Additionally, former students participating in this study completed aggieTEACH at varying times – their scores may be attributed to their reliance on their memory of mentoring. The third reason may be current student teachers felt more compelled to rate their experiences highly since they were finishing their program, while former students had mentoring experiences far removed from the administration of the survey.

Despite these reasons, this research contributes to research about pre-service and new teacher mentoring. Current research indicates pre-service and new teachers value quality mentors and highly rate thier contribution to their teaching/classroom practice; these groups also agree mentoring plays an integral part in teacher education(Brownstein et al., 2009; Bullock, 2009; Uy, 2009; Washburn, 2008; Whitney, Golez, & Nagel, 2002; Wigle & White, 1998). The participants of this study are similar to the participants in such teacher mentoring research - both of these groups have limited classroom experience. Moreover, the current student teachers in this survey, who are most similar to pre-service teachers, rated mentoring higher than the former student group. The former student group is comprised of teachers in their first year of teaching beyond.

All the possible reasons for the mentoring scale significant difference require more research. As is, the current results of this study are not generalizable. The sample size of the current student teacher group is not similar to the size of the former student group and the former student data was analyzed by teaching experience group. Increasing the current student teacher sample could provide more generalizable information. Differentiating the mentoring scale by teaching experience categories (within the former student group) would also provide more contribution to teacher mentoring research. Finally, refinement of the

113

survey instrument would allow more adaptability to varying TEP programs, as the current survey instrument is customized for TAMU TEP programs and features questions adapted from other surveys.

Confidence Scale

Like the mentoring scale, there are several reasons why the confidence scale is significantly different between current student teachers and former students. The results may be attributed to the low numbers of participating current student teachers versus the higher number of former students. Other reasons include current student teachers' positioning to connect their training to a real world setting. During this study, current student teacher participants were immersed in K – 12 classroom settings where they were able to try new strategies while gaining immediate feedback. The immediate opportunity to capture any confidence levels during these experiences may have been elevated because of associations with connecting TEP classroom training practices. Lastly, former students were immersed in a variety of settings that may have effected their confidence levels; former students may have experienced professional development or classroom/school- based interactions that could have interfered with thier confidence.

While many reasons may account for the significantly different confidence scale, the meaning of the results is still promising. The significantly different confidence scales between current student teachers and former students coincide with current research about new and pre-service teacher confidence. Most current student teachers are highly confident when exiting their program as was found in this study (Bandura, 1977; Cantrell, Young, & Moore, 2003; Champion, 2010; Tschannen-Moran, Woolfolk - Hoy, & Hoy, 1998; J. D. Wilson, 1993; J. D. Wilson, 1996). However, more research needs to be conducted on how

confidence either dissipates or increases after completing TEPs. A longitudinal research design would likely allow for tracking of confidence. Such a study would allow for increased data collection and tracking of contributing factors.

TEP Quality Scale

As the Mentoring and Confidence scales were found to be significantly different for several reasons, there are several reasons that may explain the TEP quality scale. The TEP quality scale allowed current student teachers and former students to assess their overall TEP program experiences. Since current student teachers were still involved with a facet of their TEP while participating in the study, they may have been more likely to accurately assess their overall program. However, former students had to rely on the memory of their TEP for this study. Former students could have confused their current job site and professional development experiences with their student teaching site and TEP experiences - their disconnection from their TEP may explain lower or inaccurate assessments of their TEP and the higher scale for the current student teacher group.

The TEP quality scale contributes to the research on TEP assessments despite the reasons for current student teacher participants having a higher scale than former students. Similar to other research, the TEP quality scale is typically rated higher by current TEP participants (Bowe, Braam, Lawrenz, & Kirchhoff, 2011; Boyd et al., 2008; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Burstein, Czech, Kretschmer, Lombardi, & Smith, 2009; Darling-Hammond, 2010; Delandshere & Arens, 2001; Gatlin, 2009). Current TEP participants are similar to the current student teachers that participated in this study.

More research is needed to validate a TEP Quality Scale among former students. This study adds to the current research because former students were able to assess the quality of

115

their TEP. However, this study did not accurately account for contributing factors by former students' job sites and professional development experiences at the time of completing the survey instrument. In order for this study to have greater value, more work is needed to control or account for factors presented by the former students job assignment (i.e. professional development and current classroom/school setting).

Program Characteristics Scale

The program characteristics scale is significantly different between current student teachers and former students for a few reasons. Similar to the reasons for the previously mentioned scales, the program characteristics scale may be significant because former students, who were working in education settings while completing the survey, may have forgotten many of their TEP experiences. Current student teachers had little outside TEP experiences that could confound the program characteristics they experienced. Current student teachers were still enrolled in their TEP and had access to many TEP services while completing the survey. Additional reasons for the difference also include the sizes of the current student teacher and former student group. Since the former student group is larger than the current student group, it is likely that data from the former student group has more variance. Thus, the memories of and access to TEP characteristics, along with participant group sizes, were all likely reasons for the difference between former students and current student teacher participant groups.

These possible reasons for a significantly different program characteristics scale require more research. Increasing the sample size of the current student teacher group would allow researchers to determine if their answers were truly similar. Tracking participant responses within a longitudinal study would also allow researchers to determine how

memory might impact participant answers – if participant answers stayed the same, memory may not be a factor. However, if answers changed, additional tracking of contributing experiences by the participant's job setting could be attributed to the results of the study. Increasing the current student teacher sample could provide more generalizable information, along with tracking how study participant memory was impacted by on-the-job experiences. Lastly, refinement of the survey instrument is needed. Since several program characteristics may have been added or experienced outside of the TEP, survey questions should allow participants to attempt to connect characteristics to their TEP or professional experiences.

In this discussion about the inferential results of this study, current student teachers scored, on average, higher than former students for all four scales called Mentoring, Confidence, TEP Quality, and Program Characteristics scales. The mean differences for the scales are significant at the .05-level for all four scales. The next section called, Discussion of Qualitative Findings, includes commentary about the qualitative results of this study which originate from the open-ended response section of the survey instruments.

Discussion of Qualitative Findings

In this section, a discussion of qualitative findings by participant group occurs from the open-ended response (OER) section of the current student teacher and former student surveys. The OER section of the surveys answered the research question: What do current and former student teachers perceive about their teacher education program? Each survey has three open-ended survey questions that allowed collection of data. The survey questions introduce each sub-section.

Content Analysis Results of Current Student Teacher Responses

Three open- ended response (OER) survey questions were posed to collect current student teacher perceptions of their TEP. Their responses to the OER questions describe: (a) helpful or relevant experiences during the teacher preparation program, (b) suggestions for changing or improving the program, and (c) additional information regarding the program. Discussion follows by question.

Helpful or Relevant Program Experiences

Analysis of current student teacher OERs about helpful or relevant program experiences allowed four categories to emerge. The categories account for 85% of the total responses and are student teaching (35%), field observations (20%), lesson planning (15%), and methods class (15%). Current student teachers revealed these categories as the most helpful and relevant TEP experiences; this data is on target with current research, as they are integral components of teacher education (Akcay & Yager, 2010; Albalawi, 2007; Amrein-Beardsley, Barnett, & Ganesh, 2013; Blanton, McLeskey, & Hernandez Taylor, 2014; Coble, DeStafano, Allen, Shapiro, & Frank, 2011; Darling-Hammond, Newton, & Wei, 2010). Without an emphasis on student teaching, field observations, lesson planning, and methods class, the TEP would not be meeting minimal accreditation requirements (Craig, 1989; Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005; Darling-Hammond, 2006a; Darling- Hammond, Newton, & Wei, 2010; Zeichner & Conklin, 2005; Zeichner & Paige, 2008; Zeichner, 2010b). Further, failure to mention any other innovative teacher education strategies indicates there is room for additional research.

Suggestions for Changing or Improving the Program

Two major categories emerged from current student teacher responses about suggestions for changing or improving the program. Accounting for 72% of the total responses, participants revealed the TEP needed to improve contextual preparation (52%) and classroom experiences (20%). Contextual preparation refers to realistic practices and experiences that occur in general education settings. Classroom experiences narrow the scope of contextual preparation and refer to realistic experiences in a classroom setting.

Emerged categories called contextual preparation and classroom experiences reveal participant desire for experiential learning also called problem – based learning. Problem-based learning is an instructional strategy that simulates real-world occurrences while applying newly learned knowledge (Krueger, Bobac, & Smaldino, 2004; Savery & Duffy, 1995; Savery, 2006) – it requires student to apply theory and skills often learned in isolation during core class requirement. Its likely participants in this study may have only received problem-based learning during student teaching. In most cases, student teaching occurs toward the end of the TEP. Additional data collection practices might reveal or clarify supporting or contradictory data.

Additional information regarding the program. Content analysis revealed three major categories about additional information regarding the program. Accounting for 92% of the total responses, emerged categories were called complimentary of student teaching (46%), complimentary of overall program (23%) and content methods courses (23%). These categories were general in scope and captured participants' overall sentiment of the program.

Those that chose to respond to this question provided their overall opinion of the program. Data therein is likely information that participants felt most compelled to share.

Since participants were complimentary of student teaching and methods courses yet mentioned similar areas needed improvement in the previous section, more emphasized opportunities and connections to real-world scenarios are required. This result is similar to current research about improving teacher education/preparation(Craig, 1989; Dean, Lauer, & Urquhart, 2005; Gatlin, 2009; Zeichner, 2007). From the data, it appears current student teachers valued the importance of the experiences in their limited occurrences. However, more emphasized opportunities for experiential learning were needed throughout all facets of the TEP.

The next section called, Content Analysis Results of Former Student Responses, includes discussion about open-ended response (OER) data from former students. Questions capturing former student responses begin the section. Lastly, this section is similarly organized like previous sections – each question precedes a discussion of analyzed OER data presented in chapter 4.

Content Analysis Results of Former Student Responses

This final portion of the discussion section includes discussion about results of content analyses of former student responses to three OER questions. The questions describe: (a) relevant teacher preparation program experiences needed for classroom teaching, (b) suggested changes or improvements to the teacher preparation program, and (c) additional information regarding the program. Discussion about data found from former students follows each question.

Relevant Program Experiences for Classroom Teaching

Four major categories emerged about relevant program experiences for classroom teaching during the content analysis of former student responses. The four categories are

student teaching (43%), field observations (16%), methods course (12%), and cooperating teacher assistance (10%). These categories account for 81% of the total responses and generally coincide with current research about best practices in TEPs (Coffey, 2010; Darling-Hammond, 2010; Lampert, 2010; Samimi-Duncan, Duncan, & Lancaster, 2010).

Specifically, the emerged categories relate to experiential learning and the exploration phase of TEPs (Coffey, 2010; Lampert, 2010; Samimi-Duncan, Duncan, & Lancaster, 2010; Zeichner, 2010b). These emerged categories allow pre-service teachers to explore the teaching profession with little commitment to K-12 classrooms/schools (Darling-Hammond, Newton, & Wei, 2010; Darling-Hammond, 2010; Grossman, Hammerness, & McDonald, 2009; Hammerness et al., 2005; Muñoz, 2010). It is promising that former students highlighted these categories; former students are teachers and are likely determining which TEP experiences were most relevant to a classroom teacher while responding to the survey.

While former students deem these categories most helpful to successful teacher education, their revealed categories are no surprise. TEPs have included these categories in their practices for several years (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005; Grossman, Hammerness, McDonald, & Ronfeldt, 2008; Grossman & McDonald, 2008; Sykes, Bird, & Kennedy, 2010; Zeichner, 2010b). Specifically, these mentioned categories allow TEP participants to observe teaching prior to influencing K-12 student knowledge. TEP participants also apply learned theory, skills, and knowledge to real-world scenarios by micro-teaching to peers. Lastly, pre-service teachers in TEPs receive crucial feedback about implementation of practices and techniques during student teaching, or as cooperating teacher assistants.

In order for TEPs to improve pre-service teacher preparation, additional or improved TEP components should occur. Former students have suggested some ideas in the next section. A discussion about suggestions for changing or improving the TEP occurs below.

Suggestions for Changing or Improving the Program

For the sample of former student responses, one major category and a second cluster of semi-major categories emerged and accounted for 34% of the total responses. The first category is school- contextualized experiences. The second cluster of categories accounted for 24% of the total responses and include course relevancy with school contexts (9%), special population education (8%), and provide curricula exemplars (7%).

Unlike the categories provided in the previous section, these categories provide more specificity about the extent of experiential learning former students deem helpful. Within student teaching as cooperative teacher assistance, field observations, and methods courses, pre-service teachers can have more school-contextualized experiences(Bergman, 2007; Clift & Brady, 2005; Darling-Hammond, 2006b; Zeichner, 2010b). School contextualized experiences include implementing instructional strategies while teaching academic content, managing classes of students, effectively leveraging student learning styles and ability levels, and interacting with parents and school administrators(Grossman, Hammerness, & McDonald, 2009; Lampert, 2010; Whitney, Golez, & Nagel, 2002; J. D. Wilson, 1996; S. M. Wilson, Floden, & Ferrini-Mundy, 2001, February; Wineburg, 2006). Since former student participants referenced school-contextualized experiences, course relevancy with school contexts, special population education, and provide curricula exemplars, as suggestions for improving the program, it is likely that they felt unprepared and/or anxious when initially entering the teaching profession.

The former student data appears as two main categories with small percentages. Additionally, there are several courses and requirements in a TEP than student teaching, cooperative teacher assisting, field observations, and methods courses. Its highly possible explicit connections with real-world school scenarios are not occurring in all facets of the TEP - all teacher educators of methods and theory courses may not provide direct connections to schooling. Identification of the categories in this section should signal the TEP and teacher educators to integrate more contextualized learning opportunities in the TEP program. Failure to overtly state the connections likely led former students to question the relevancy of required (and elective) course content and practices.

Former student participation in this study allows a collection of retrospective data. Comparison of former student data with current student teacher data allows the TEP to determine improvement areas. The final data collection point allowed former students to offer unguided commentary about their TEP. The section titled additional information regarding the program concludes the qualitative discussion section about former student OER data.

Additional Information Regarding the Program

Content analysis of former student data revealed five major categories of additional information regarding the program. The emerged categories accounted for 76% of the total responses and are complimentary of overall program (28%), school contextualized experiences (15%) complimentary of student teaching (13%), teacher educator qualifications (10%) and degree plan requirements and courses (10%).

The data connects back to the areas previously mentioned, emphasizing school contextualized experiences, student teaching, and course requirements. In general, former

students are complimentary of the overall TEP and their student teaching experience. However, former students' mentioning of teacher educator qualifications and degree plan requirements and courses indicate doubt about the relevancy and effectiveness of a few facets of the TEP.

The TEP likely needs to focus improvements on their teacher educator selection and course descriptions and content. The TEP should ensure all teacher educators have K-12 classroom and school experience of 5 or more years according to Texas State Board of Education Committee requirements. Courses and degree requirements should explicitly connect with teacher education requirements. Finally, teacher educators should effectively convey such connections during instruction.

Teacher educators can likely convey course content to K-12 school connections by implementing scenario-based or school-contextualized instruction. Scenario-based or school contextualized instruction allows participants to learn academic content knowledge and pedagogical theory by applying concepts to real-world scenarios and problems (Leatham & Peterson, 2010; Ong'ondo & Jwan, 2009). Typical assessments for such instruction require student presentations and/or collaborative teaming. Finally, there are no stringent correct answers for the assessments – students explore a variety of outcomes allowing the teacher educator to evaluate student application of concepts and skills.

Implications title the next section of this dissertation. The section is organized by how this study improves or changes teacher education programs (TEPs), differs from other research, and impacts future research.

Implications

In my dissertation, I examine the problem of how to determine a quality teacher education program. The purpose of my study presents an understanding of teacher education program quality via current student teacher and former student perceptions. In the literature review, research about teacher perceptions, knowledge, and evaluation of teacher education programs provide background information about this study. I decided a mixed methods approach was best and applied principal components analysis and exploratory factor analysis to the quantitative data and content analysis to the qualitative data generated in this study. Implications for quantitative results and qualitative findings presented in chapter 4 occur in this section. Titles for each sub-section are implications for teacher education programs, implications for current literature, and finally, implications for further research.

Implications for Teacher Education Programs

Assessing current student teacher and former student perceptions of aggieTEACH experiences revealed results and findings that lead to implications for teacher education programs. Results that directly impact TEPs originated from current student teacher and former student data. For example, current student teachers provided high average scores on the mentoring scale. Additionally, former students provided suggestions for improving the TEP.

Mentoring was denoted as a highly valued component of the TEP experience by both current student teachers and mentor teachers. Both provided high average agreement on the mentoring scale. This denotes mentors should remain an integral component of the TEP experience. Their presence, as represented by my data, positively aids developing teachers. My results also concur with current research about improving teacher education/preparation

125

(Craig, 1989; Dean, Lauer, & Urquhart, 2005; Gatlin, 2009; Zeichner, 2007). Therefore, TEPs should hire more mentor teachers to offer guidance throughout the TEP experience instead of mainly during student teaching; doing so may allow helpful insight from a real-time practitioner and improve participant perceptions of the TEP.

Former students and current students also indicated other potential improvements of aggieTEACH. In my identification of categories using content analysis, I learned improved perceptions could occur if integration of more contextualized learning opportunities occurred during courses. For example, teacher educators could use problem- based learning to immerse students into K-12 schooling contexts. Doing so would allow students to apply theory, concepts, and skills. Consequently, TEPs should likely integrate instructional practices that contextualize theory and skills for K-12 classroom teaching.

Scenario-based or school contextualized instruction allows participants to learn academic content knowledge and pedagogical theory by applying concepts to real-world scenarios and problems (Leatham & Peterson, 2010; Ong'ondo & Jwan, 2009). Typical assessments for such instruction require student presentations and/or collaborative teaming. Students explore a variety of outcomes allowing the teacher educator to evaluate student application of concepts and skills. Moreover, overt connections to the teaching profession occur so participants' perceptions improve about the TEP. Since former and current students cited contextualizing learning as a suggestion for improving TEP courses, scenario-based or contextualized learning strategies should be emphasized in the courses.

In addition to improving aggieTEACH by contextualizing learning, former students mentioned improving teacher educator selection. All TEPs should ensure all teacher educators have K-12 classroom and school experience of 5 or more years according to Texas

State Board of Education Committee requirements. Since this suggestion was made, TEPs should refrain from allowing faculty who have limited experiences in K-12 classroom instruction to teach TEP courses. This implication could likely improve and vary the teaching strategies used in TEP courses, as I assume more experience indicates greater knowledge and ability to implement engaging instructional strategies.

The next sub-section titled, Implications for Current Literature, indicates how this study differs from current TEP literature. Within this sub-section, I contrast previous studies with this dissertation. Contrasting this dissertation with other studies indicates which gaps were present in the literature and filled by this study.

<div align="center">Implications for Current Literature</div>

Conducting this study required location of research that supported and differed from the practices and methods therein. This section focuses on how this dissertation's results and findings diverge from other research. As stated in literature cited in chapter 2, this study contrasts literature about evaluation of TEPs. Specifically, this study differs by proxy for TEP efficacy.

This study results in different proxies for TEP efficacy. In chapter 2, I reference participant pre-post scores on standardized content exams (Craig, 1989; Galluzzo, 1983; Krajcik & Penick, 1989; Van Zandt, 1998) as a proxy for evaluating TEPs. Additionally, course syllabi (National Council on Teacher Quality, 2011a; National Council on Teacher Quality, 2011b) is also referenced. Instead, this study mentions TEP participant's perceptions about factors and emerged categories as proxy for TEP efficacy.

The factors in this study were a mentoring scale, confidence scale, TEP quality scale, and program characteristics scale. Major emerged categories from both current student

teachers and former students included student teaching, field observations, lesson planning, and methods class. These factors and emergent categories concur with proxies in current literature: levels of teacher efficacy (Van Zandt, 1998; Wilson, 1996) as referenced by the confidence scale, amount of field experience (Alvis-Rhea, 2001; Coffey, 2010; McKeny, 2006; Munby, Lock, & Hutchinson, 1999; Myers, 1996; Zeichner, 2010b; Zimpher, 1989) as referenced by desire for more field experiences throughout the TEP, perception about programmatic components (Metzler & Tjeerdsma - Blankenship, 2008) as indicated by levels of agreement and confidence on the aforementioned scales, and overall satisfaction (Metzler & Tjeerdsma - Blankenship, 2008; Pepper & Hare, 1999; Smith, Smith, & Boone, 2000) as related to data from the indirect open-ended response questions which requested suggestions and comments.

The last sub-section titled, Implications for Further Research, suggests additional studies by mentioning how this study may be extended or improved. Within this sub- section, I also address limitations of this study.

Implications for Further Research

This study suggests additional research about former students and current student teacher perceptions. For example, a study could compare former student perceptions of their current teaching site with their TEP assigned student teaching site. Former student experience levels (or graduation years) could be used to determine differences between the scales in this study. Additionally, longitudinal research on current student teacher TEP perceptions could be used to track changing agreement and confidence levels overtime. More about these potential studies follow.

Former students recall and assess their student teaching campus characteristics that results in a TEP quality scale in this study. The scale is based on agreement levels about statements referencing components and characteristics of their student teaching site. The current survey instrument does not include the following questions: (a) How many years have you taught after your student teaching experience? (b) Is your current campus the same campus you had your student teaching experience? (c) How many campuses have you taught at after your student teaching campus? Asking these questions in conjunction with the former student survey questions would allow comparison of former students' perceptions by student teaching sites and current teaching sites. Resulting data might yield information about preparedness and compatibility levels between TEPs, student teaching sites and current teaching sites. Without the addition of the previously mentioned questions, this information is not currently available with the current content of the former student surveys.

Former students participating in this study are not requested to provide their graduation year or years of teaching experience. As is, the scales in this study are not analyzed by former student experience level. Further, data from recent graduates of the TEP cannot be compared with the current student teacher data. Changing the content of the surveys so former students could indicate their experience level (or graduation year) would create a new study. The new study could determine how the scales identified in this study differ by former student graduation year or experience level.

As adding questions to the former student survey could create a new study, changing this study's research design to collect data from more current student teachers over time also creates a new study. Increases of current student teacher data over several years could occur by administering the survey as each participant ends the program.

Currently, analysis of the scales in this study showed current student teacher data had little variability. Current student teachers were similar by major, gender, and TEP. Changing this study' research design to a longitudinal research design could assess potentially increasing or waning agreement and confidence levels. The longitudinal research design would also increase the current student teacher numbers, adding more variability to the group. Since mathematics and science teacher education programs typically have small populations, this longitudinal collection of current student teacher data could also be compared to the larger former student populations that graduate from a teacher education program over time.

Limitations of this Study

This study's results and findings are limited. Additionally, the TEP quality scale for former students is likely unreliable. If the participant sizes and content of the survey instruments of this study were changed, there might be more reliability and generalizability across more TEPs than aggieTEACH. Potential effects of changing the participant sizes and content of the survey instruments follow.

The current student teacher sample in this study should be increased. Increasing the sample could provide more generalizable conclusions. Since mathematics and science teacher education programs typically have small populations, collecting current student teacher data at the end of a TEP over several years might yield enough current student teacher data that may be compared with former student data. Longitudinal collection of current student teacher data could also allow different data analyses after revision of the survey instruments used in this study.

The survey instruments also limits this study. Refinement of the survey instrument would allow more adaptability to varying TEP programs. Decisions about common

occurrences in TEPs and norming on minimum standards, names of skills, knowledge, and general competencies would have to occur. The current survey instrument is customized for TAMU TEP programs, where items were included (or excluded) based on researcher knowledge or advice from stakeholders who might use the data to improve TAMU TEPs. Decreasing the number and specificity of the survey items might help increase generalizability.

The last section of this chapter is called Summary of Chapter Five. Brief paragraphs highlight the chapters therein to provide a high level overview of the entire study.

Summary of Chapter Five

Pre-service teacher proficiency levels to teach in Texas classrooms occur in state curriculum and professional standards. To date, policy makers scrutinize teacher education programs for their ability to help pre-service teachers reach proficiency in these state standards. This dissertation presents an understanding of a teacher education program's quality via analysis of its current student teacher and former student perceptions. In preparation for the study, research about teacher perceptions, knowledge, and evaluation of teacher education programs yielded background information to craft this study.

Data from two participant groups are analyzed in this study. The first group called current student teachers (n=11) and the second group, former students (n=78) originate from one program called, aggieTEACH, a secondary mathematics and science teacher education program. Of the current student teachers and former students participating in this study, 77.5% (n = 69) were female, 21.3% (n = 19) were male and 1.1% (n = 1) did not disclose their gender; additionally, 80.9% (n = 72) identify as white or Caucasian, 9% (n = 8) identify as Hispanic, 7.8% (n = 7) identifying as African American, Asian, or other, and 2.2% (n = 2)

decided not to disclose their race.

This study is a mixed methods study of secondary data generated in a larger study about all Texas A&M University teacher education programs. The study reveals only aggieTEACH participant's agreement and confidence levels in four scales generated by the quantitative analysis of this study. The generated scales are mentoring, confidence, TEP quality, and program characteristics. I used principal components analysis and exploratory factor analysis to generate the scales. Additionally, I used content analysis to review to reveal emergent themes about mentoring, field experiences, and contextualized learning practices.

Significant differences occurred between current student teacher and former student participants' agreement and confidence levels about the teacher education program characteristics and experiences. Current student teachers scored higher on average and have less variability to former students on (a) mentoring, (b) confidence, (c) TEP quality, and (d) program characteristics scales. Lastly, both current student teachers and former students identified student teaching and field observations as the most helpful or relevant component of their teacher education program experiences.

The discussion about quantitative results highlighted rationale for the mentoring and confidence scales. While both scales had high average scores by current student teachers, this was likely due to the low numbers of participants. The discussion about qualitative findings showed former students and current student teachers mentioning mentoring and student teaching, as integral components of their TEP experience. After the discussion section, implications for teacher education programs, current literature and further research were provided. Within the section about implications for teacher education programs, I related the discussion section with current TEP operations. Within the section about implications for

current literature, I review how my results differ from the TEP evaluation literature in chapter 2. Lastly, in the implications for further research section, I highlight this study's limitations and provide ideas for new research that could occur from this study.

REFERENCES

Akcay, H., & Yager, R. (2010). Accomplishing the visions for teacher education programs advocated in the National Science Education Standards. *Journal of Science Teacher Education, 21*(6), 643-664. doi:10.1007/s10972-010-9213-0

Albalawi, A. (2007). *An evaluation of the intermediate teachers preparation program in mathematics at Makkah Teacher's College in Saudi Arabia* (Doctoral dissertation). Available from ProQuest Dissertations & Theses Full Text. (3276877).

Alghanem, M. M. (2005). *Evaluating the middle school mathematics teacher preparation program at Riyadh Teachers' College* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text. (3169074).

Alvis-Rhea, M. S. (2001). *Field experiences in science teacher preparation programs of Missouri* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text. (3052240).

American Association of State Colleges and Universities. (2005). *The facts -- and fictions – about teacher shortages.* (No. 5). Washington, DC: American Association of State Colleges and Universities.

Amrein-Beardsley, A., Barnett, J., & Ganesh, T. G. (2013). Seven legitimate apprehensions about evaluating teacher education programs and seven beyond excuses imperatives. *Teachers College Record, 115*(12) Retrieved from http://www.tcrecord.org/library

Atkinson, D. J., & Bolt, S. (2010). Using teaching observations to reflect upon and improve teaching practice in higher education. *Journal of the Scholarship of Teaching and Learning, 10*(3), 1-- 19.

Atwater, M. M., Freeman, T. B., Butler, M. B., & Draper-- Morris, J. (2010). A case study of

    science teacher candidates' understandings and actions related to the culturally

    responsive teaching of other students. *International Journal of Environmental and*

    Science Education, 5(3), 287-- 318.

Ayers, J. B., & Berney, M. F. (1989). Background for teacher education program

    evaluation. In J. B. Ayers, & M. F. Berney (Eds.), *A practical guide to teacher*

    education evaluation (pp. 3-- 12). Norwell, MA: Kluwer. doi:10.1007/978-- 94--

    009-- 2512-- 0_2

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change.

    Psychological Review, 84(2), 191-- 215. Retrieved from

    http://dx.doi.org/10.1037/0033295X.84.2.191

Bergman, D. (2007). *The effects of two secondary science teacher education program*

    structures on teachers' habits of mind and action (Doctoral Dissertation).

    Available from ProQuest Dissertations & Theses Full Text. (3259478).

Berliner, D. C. (2000). A personal response to those who bash teacher education. *Journal*

    of Teacher Education, 51(5), 358-- 371. doi:10.1177/0022487100051005004

Blanton, L. P., McLeskey, J., & Hernandez Taylor, K. (2014). Examining indicators of

    teacher education program quality. In P. T. Sindelar, E. D. McCray, M. T. Brownwell

    & B. Lignugaris/Kraft (Eds.), *Handbook of research on special education teacher*

    preparation (pp. 129-142). New York, NY: Routledge. doi:10.4324/9780203817032

Boehmer, R. F., & Waugh, M. L. (1997). Developing a distributed learning community:

    Undergraduate education majors use the internet to engage in early teaching

    experiences in biology. *Journal of Computing in Teacher Education, 13*(2), 7-15.

doi:10.1080/10402454.1997.10784306

Bowe, A., Braam, M., Lawrenz, F., & Kirchhoff, A. (2011). Comparison of alternative and

traditional teacher certification programs in terms of effectiveness in encouraging

STEM pre-service teachers to teach in high needs schools. *Journal of the*

National Association for Alternative Certification, 6(1), 26-45. Retrieved from

http://www.jnaac.net/index.php/test/article/view/5

Boyd, D. J., Grossman, P., Hammerness, K., Lankford, R. H., Loeb, S., McDonald, M., . . .

Wyckoff, J. (2008). Surveying the landscape of teacher education in New York City:

Constrained variation and the challenge of innovation. *Educational Evaluation and*

Policy Analysis, 30(4), 319-- 343. doi:10.3102/0162373708322737

Boyd, D. J., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher

preparation and student achievement. *Educational Evaluation and Policy*

Analysis, 31(4), 416-- 440. doi:10.3102/0162373709353129

Brownstein, E. M., Allan, E., Ezrailson, C. M., Hagevik, R. A., Shane, J. W., & Veal, W. R.

(2009). Alignment of the 2003 NSTA standards for science teacher preparation with

the CATE assessment system. *Journal of Science Teacher Education, 20*(5), 403-413.

doi:10.1007/s10972-009-9143-x

Brownstein, E. M., Allan, E., Hagevik, R., Shane, J., & Veal, W. (2009). Understanding and

using the 2003 NSTA science teacher preparation standards for NCATE accreditation

or state approval. *Journal of Science Teacher Education, 20*(4), 307-311.

doi:10.1007/s10972-009-9139-6

Bullock, S. M. (2009). Learning to think like a teacher educator: Making the substantive and

syntactic structures of teaching explicit through self-study. *Teachers and Teaching:*

Theory and Practice, 15(2), 291-304. doi:10.1080/13540600902875357

Burstein, N., Czech, M., Kretschmer, D., Lombardi, J., & Smith, C. (2009). Providing

qualified teachers for urban schools: The effectiveness of the accelerated

collaborative teacher preparation program in recruiting, preparing, and

retaining teachers. *Action in Teacher Education, 31*(1), 24-37.

doi:10.1080/01626620.2009.10463508

Cantrell, P., Young, S., & Moore, A. (2003). Factors affecting science teaching efficacy of

preservice elementary teachers. *Journal of Science Teacher Education, 14*(3), 177-

192. doi:10.1023/A:1025974417256

Cepni, S. (1993). *New secondary science teachers' development in Turkey: Implications for*

the academy of new teachers programme (Doctoral Dissertation). Available from

ProQuest Dissertations & Theses Full Text. (C359763).

Champion, J. (2010). *The mathematics self-- efficacy and calibration of students in a*

secondary mathematics teacher preparation program (Doctoral Dissertation).

Available from ProQuest Dissertations & Theses Full Text. (3404504).

Chou, C. (2010). Investigating the effects of incorporating collaborative action research into

an in-service teacher training program. *Procedia - Social and Behavioral*

Sciences, 2(2), 2728-2734. doi:10.1016/j.sbspro.2010.03.404

Clift, R. T., & Brady, P. (2005). Research on methods courses and field experiences. In M.

Cochran-- Smith, & K. M. Zeichner (Eds.), *Studying teacher education: The report*

of the AERA panel on research and teacher education (pp. 309-- 424). Mahwah, NJ:

Lawrence Erlbaum. doi:10.4324/9780203864043

Cobanoglu, C., Warde, B., & Moreo, P. J. (2001). A comparison of mail, fax and web-based

    survey methods. *International Journal of Market Research, 43*(4), 441-452. Retrieved

    from http://www.amstat.org/sections/srms/Proceedings/papers/2000_065.pdf

Coble, C., DeStafano, L., Allen, M., Shapiro, N., & Frank, J. (2011). *Developing the*

    analytical framework: A tool for supporting innovation and quality design in the

    preparation and development of science and math teachers. Washington, DC:

    Association of Public and Land Grant Universities.

Cochran-Smith, M. (2004). The problem of teacher education. *Journal of Teacher*

    Education, 55(4), 295-- 299. doi:10.1177/0022487104268057

Cochran-Smith, M. (2005). The new teacher education: For better or for worse? *Educational*

    Researcher, 34(7), 3-16. doi:10.3102/0013189x034007003

Cochran-Smith, M., & Fries, K. (2005a). Researching teacher education in changing

    times: Politics and paradigms. In M. Cochran-- Smith, & K. M. Zeichner

    (Eds.), *Studying teacher education: The report of the AERA panel on the*

    research and teacher education (pp. 69-- 109) Lawrence Erlbaum.

Cochran-Smith, M., & Fries, K. (2005b). Researching teacher education in changing

    times: Politics and paradigms. In M. Cochran-- Smith, & K. M. Zeichner (Eds.),

    Studying teacher education: The report of the AERA panel on research and teacher

    education (pp. 69-110). Mahwah, NJ: Routledge. doi:10.4324/9780203864043

Cochran-Smith, M., & Zeichner, K. M. (2005). In Cochran-- Smith M., Zeichner K. M. (Eds.),

    Studying teacher education: The report of the AERA panel on research and teacher

    education (1st ed.). Mahwah, NJ: Routledge. doi:10.4324/9780203864043

Coffey, H. (2010). They taught me: The benefits of early community-based field experiences

in teacher education. *Teaching and Teacher Education, 26*(2), 335-342.

doi:10.1016/j.tate.2009.09.014

Cohan, A., & Honigsfeld, A. (2006). Incorporating lesson study in teacher preparation. *The Educational Forum, 71*(1), 81-- 92. doi:10.1080/00131720608984570

Colburn, A. (1991). *Model programs for the preparation of middle school math and science teachers: A descriptive case study* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text. (9212861).

Conley, D. T. (2003). *Understanding university success: A report from Standards for Success: A project of the Association of American Universities and the Pew Charitable Trusts*. Eugene, OR: Center for Educational Policy Research.

Conley, D. T. (2005). *College knowledge: what it really takes for students to succeed and what we can do to get them ready*. San Francisco, CA: Jossey-- Bass.

Conley, D. T. (2010). *College and Career Ready: Helping all students succeed beyond high school*. San Francisco, CA: Jossey-- Bass.

Committee on a New Biology for the 21st Century. (2009). *A new biology for the 21st century: Ensuring the United States leads the coming biology revolution*. Washington, D.C.: National Academies Press. doi:10.2172/1039739 Copenhaver, R. W., Waggoner, J. E., & Young, A. L. (1997). Promoting preservice teachers' professional growth through developmental portfolios. *The Teacher Educator, 33*(2), 103-111. doi:10.1080/08878739709555163

Craig, J. R. (1989). Follow-up evaluation of teacher education programs. In J. B. Ayers, & M.F. Berney (Eds.), *A practical guide to teacher education program evaluation* (pp. 131- 150). Norwell, MA: Kluwer. doi:10.1007/978-94-009-2512-0_11

Creswell, J. W., & Plano-- Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage Publications. doi:10.1111/j.1753--6405.2007.00096.x

Cummings, M. (2010). *Rethinking teacher preparation: Conceptualizing skills and knowledge of novice teachers of secondary mathematics* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text. (3405691).

Dantas, M. L. (2007). Building teacher competency to work with diverse learners in the context of international education. *Teacher Education Quarterly, 34*(1), 75-94. Retrieved from http://teqjournal.org/Back%20Issues/Volume%2034/VOL34%20PDFS/34_1/12dantas-34_1.pdf

Darling-Hammond, L. (2006a). Assessing teacher education: The usefulness of multiple measures for assessing program outcomes. *Journal of Teacher Education, 57*(2), 120-138. doi:10.1177/0022487105283796

Darling-Hammond, L. (2006b). Constructing 21st-- century teacher education. *Journal of Teacher Education, 57*(3), 300-- 314. doi:10.1177/0022487105285962

Darling-Hammond, L. (2006c). *Powerful teacher education: Lessons from exemplary programs* (1st ed.). San Francisco, CA: Jossey-- Bass.

Darling-Hammond, L. (2007). We need to invest in math and science teachers. *The Chronicle of Higher Education, 54*(17), B20. Retrieved from http://chronicle.com/article/We-Need-to-Invest-in-Math-and/14523/

Darling-Hammond, L. (2008). Chapter 2 Reshaping teaching policy, preparation, and

practice: Influences the national board or ofessional teaching standards. L.

Ingvarson, & J. Hattie (Eds.), *Assessing teachers for professional certification: The first decade of the National Board for Professional Teaching Standards* (1st ed., pp. 25 53). Oxford, UK: Elsevier JAI Press. doi:10.1016/S1474 7863(07)11002 4

Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education, 61*(1 2), 35 47. doi:10.1177/0022487109348024

Darling-Hammond, L., Chung, R., & Frelow, F. (2002). Variation in teacher preparation: How well do different pathways prepare teachers to teach? *Journal of Teacher Education, 53*(4), 286-302. doi:10.1177/0022487102053004002

Darling-Hammond,L ., Hammerness, K., Grossman, P., Rust, F., Shulman, L. S. (2005). The design of teacher education programs. In L. Darling Hammond, J. Bransford(Eds.), *Preparing teachers for a changing world: What teachers should learn and be able todo* (1st ed., pp. 390 441). San Francisco, CA: Jossey Bass. doi:10.5860/choice.43 1083

Darling-Hammond, L., Macdonald, M. B., Snyder, J., Whitford, B. L., Ruscoe, G., & Fickel,L. (2000). *Studies of excellence in teacher education: Preparation at the graduate level.* (RIE No. ED468433). Washington, DC: American Association of Colleges for Teacher Education Publications. Retrieved rom ERIC

Darling-Hammond, L., Newton, X., & Wei, R. C. (2010). Evaluating teacher education outcomes: A study of the Stanford teacher education programme. *Journal of Education for Teaching, 36*(4), 369-388. doi:10.1080/02607476.2010.513844

Davis, N. E., & Roblyer, M. D. (2005). Preparing teachers for the schools that technology

built: Evaluation of a program to train teachers for virtual schooling. *Journal of Research on Technology in Education, 37*(4), 399-409. doi:10.1080/15391523.2005.10782445

Dean, C. B., & Lauer, P. A. (2003). *Systematic evaluation for continuous improvement of teacher preparation: Cross case analysis.* Aurora, CO: Mid continent Researchfor Education and Learning.

Dean, C. B., Lauer, P., & Urquhart, V. (2005). Outstanding teacher education programs: What do they have that the others don't? *Phi Delta Kappan, 87*(4), 284-289. doi:10.1177/003172170508700406

Delandshere, G., & Arens, S. A. (2001). Representations of teaching and standards-based reform: Are we closing the debate about teacher education? *Teaching and Teacher Education, 17*(5), 547-566. doi:10.1016/S0742-051X(01)00013-0

Education Research Center. (2012). *TAMU educator preparation collaborative.* (No. 3). College Station, TX: State of Texas Education Research Center at Texas A&M University.

Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods*. Newbury Park, CA: Sage.

Fraser, J. W. (2007). *Preparing America's teachers: A history*. New York: TeachersCollege Press.

Galluzzo, G. R. (1983, April). An evaluation of a teacher preparation program. *Paper Presented at the Annual Meeting of the American Educational Research Association,* Montreal, Canada.

Gatlin, D. (2009). A pluralistic approach to the revitalization of teacher education. *Journal of*

Teacher Education, 60(5), 469-477. doi:10.1177/0022487109348597

Giebelhaus, C. R. (1998). A look at specialized middle-level preparation. *The Teacher Educator, 34*(2), 71-88. doi:10.1080/08878739809555189

Grossman, P. (1990). *The making of a teacher: Teacher knowledge and teacher education.* New York, NY: Teachers College Press.

Grossman, P., Hammerness, K., & McDonald, M. (2009). Redefining teaching, re imagining teacher education. *Teachers and Teaching: Theory and Practice, 15*(2), 273 289. doi:10.1080/13540600902875340

Grossman, P., Hammerness, K., McDonald, M., & Ronfeldt, M. (2008). Constructing coherence: Structural predictors of perceptions of coherence in NYC teacher education programs. *Journal of Teacher Education, 59*(4), 273-287. doi:10.1177/0022487108322127

Grossman, P., & McDonald, M. (2008). Back to the future: Directions for research in teaching and acher ducation. *American Educational Research Journal, 45*(1), 184 205. doi:10.3102/0002831207312906

Haefner, L. A., Friedrichsen, P. M., & Zembal - Saul, C. (2006). Teaching with insects: An applied life science course for supporting prospective elementary teacher's scientific inquiry. *The American Biology Teacher, 68*(4), 206-212. doi:10.1662/0002-7685(2006)68[206:twiaal]2.0.co;2

Halpin, R. (1999). Breaking the rote memorization mindset of preservice teachers standards-based Instruction: An integrated preservice teacher education model. *Research in the Schools, 6*(2), 45-54.

Hammerness, K., Darling Hammond, L., Bransford, J., Berliner, D. C., Cochran Smith, M.,

McDonald, M., & eichner, K. M. (2005). ow achers arn and evelop. In L. Darling

Hammond, & J. Bransford (Eds.), *Preparing teachers for a changing world: What

teachers should learn and be able to do* (1st ed., pp. 358 389). San Francisco,

CA:Jossey Bass.

Hammrich, P. L. (1998). What the science standards say: Implications forteacher

education. *Journal of Science Teacher Education, 9*(3),165 186.

Hill, H. C., Loewenberg-Ball, D., & Schilling, S. G. (2008). Unpacking pedagogical content

knowledge: Conceptualizing and measuring teachers' topic-specific knowledge of

students. *Journal of Research in Mathematics, 39*(4), 372-400.

Hill, H. C., Rowan, B., & Loewenberg-Ball, D. (2005). Effects of teachers' mathematical

knowledge for teaching on student achievement. *American Educational Research

Journal, 42*(2), 371-406. doi:10.3102/00028312042002371

Ingersoll, R. M., & Perda, D. (2009). *The mathematics and science teacher shortage: Fact

and myth.* (No. RR 62). Philadelphia, PA: Consortium for Policy Research in

Education.

Justice, M., Greiner, C., & Anderson, S. (2003). Determining the influences of traditional

Texas teachers vs. teachers in the emergency teaching certification program.

Education, 124(2), 376-389.

Kaplowitz, M. D., Hadlock, T. D., & Levine, R. (2004). A comparison of web and mail

survey response rates. *Public Opinion Quarterly, 68*(1), 94-101.

doi:10.1093/poq/nfh006

Keller, C. L., Brady, M. P., Duffy, M. L., Forgan, J., & Leach, D. (2008). If you build it and

they still don't come: Effective versus successful alternative teacher preparation. *The

Educational Forum, 72(3), 228-244. doi:10.1080/00131720802046032

Kerr, P. R. (2006). *Design and validation of a standards based science teacher efficacy instrument* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text. (3226524).

Khan, S. H., & Saeed, M. (2010). Evaluating the quality of BEd programme: Students' views of their college experiences. *Teaching and Teacher Education, 26*(4), 760-766. doi:10.1016/j.tate.2009.10.011

Korthagen, F. (2001). *Linking practice and theory: The pedagogy of realistic teacher education*. Mahwah, NJ: Lawrence Erlbaum. doi:10.4324/9781410600523

Krueger, K., Bobac, M., & Smaldino, S. (2004). InTime impact report: What was InTime's effectiveness and impact on faculty and preservice teachers? *Journal of Technology and Teacher Education, 12*(2), 185 210.

Lampert, M. (2010). Learning teaching in, from, and for practice: What do we mean? *Journal of Teacher Education, 61*(1 2), 21 34. doi:10.1177/0022487109347321

Leana, C. R. (2011). The missing link in school reform. *Stanford Social Innovation Review, Fall*, 30 35.

Leatham, K. R., & Peterson, B. E. (2010). Secondary mathematics cooperating teachers' perceptions of the purpose of student teaching. *Journal of Mathematics Teacher Education, 13*(2), 99-119. doi:10.1007/s10857-009-9125-0

Lederman, N. G., Gess-Newsome, J., & Latz, M. S. (1994). The nature and development of pre-service science teachers' conceptions of subject matter and pedagogy. *Journal of Research in Science Teaching, 31*(2), 129-146. doi:10.1002/tea.3660310205

Lederman, N. G., & Latz, M. S. (1995). Knowledge structures in the preservice science

teacher: Sources, development, interactions, and relationships to teaching. *Journal of Science Teacher Education, 6*(1), 1-19. doi:10.1007/bf02614542

Lewis, L., Parsad, B., Carey, N., Bartfai, N., & Smerdon, B. (1999). *Teacher quality: A report on the preparation and qualifications of public school teachers.* Washington, DC: National Center for Education Statistics. doi:10.1037/e429832005 001

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA:Sage.

Loewenberg-Ball, D., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education, 59*(5), 389-407. doi:10.1177/0022487108324554

Loewenberg-Ball, D., Thueule-Lubienski, S., & Spangler-Mewborn, D. (2001). Research on teaching mathematics: The unsolved problem of teachers' mathematical knowledge.In V. Richardson (Ed.), *Handbook of research on teaching* (4th ed., pp. 433-456). New York, NY: Macmillian.

Loewenberg Ball, D., & Williamson McDiarmid, G. (1989). *The subject matter preparation of teachers.* (Issue per No. 89 4). East Lansing, MI: The National Center for Researchon Teacher Education.

Lubinski, C. A., & Otto, A. D. (2004). Preparing K-8 preservice teachers in a contentcourse for standards-based mathematics pedagogy. *School Science and Mathematics, 104*(7), 336-350. doi:10.1111/j.1949-8594.2004.tb18252.x

Ludlow, L., Mitescu, E., Pedulla, J., Cochran-Smith, M., Cannady, M., Enterline, S., & Chappe, S. (2010). An accountability model for initial teacher education. *Journal of Education for Teaching, 36*(4), 353-368. doi:10.1080/02607476.2010.513843

Luera, G. R., & Otto, C. A. (2005). Development and evaluation of an inquiry-based

elementary science teacher education program reflecting current reform movements. *Journal of Science Teacher Education, 16,* 241-258.

Lunenberg, M., & Korthagen, F. A. J. (2009). Experience, theory, and practical wisdom in teaching and acher ducation. *Teachers and Teaching: Theory and Practice, 15*(2), 225 240. doi:10.1080/13540600902875316

Lustick, D. (2009). The failure of inquiry: Preparing science teachers with an authentic investigation. *Journal of Science Teacher Education, 20*(6), 583 604. doi:10.1007/s10972 009 9149 4

Marbach-Ad, G., Briken, V., Frauwirth, K., Gao, L., Hutcheson, S. W., Joseph, S. W., . . . Smith, A. C. (2007). A faculty team works to create content linkages among various courses to increase meaningful learning of targeted concepts of microbiology. *CBE – Life Sciences Education, 6*(Summer 2007), 155-162. doi:10.1187/cbe.06-12-0212

Martin, A. K., & Russell, T. (2009). Seeing teaching as a discipline in the context of preservice teacher education: Insights, confounding issues, and fundamental questions. *Teachers and Teaching: Theory and Practice, 15*(2), 319-331. doi:10.1080/13540600902875381

Metzler, M. W., & Tjeerdsma - Blankenship, B. (2008). Taking the next step: Connecting teacher education, research on teaching, and programme assessment. *Teaching and Teacher Education, 24*, 1098-1111. doi:10.1016/j.tate.2007.02.014

Miller, P. S., & Stayton, V. D. (2006). Interdisciplinary teaming in teacher preparation. *Teacher Education and Special Education, 29*(1), 56 68. doi:10.1177/088840640602900107

Mukhopadhyay, R. (2014). Quality in teacher education: Various parameters and

effective quality management. *IOSR Journal of Humanities and Social Science, 19*(2), 66 71. doi:10.9790/0837 19216671

Munby, H., Lock, C., & Hutchinson, N. L. (1999). Evaluation by teacher candidatesof a field- based teacher education program using focus groups. *Teacher Education Quarterly, 26*(2), 35-50. Retrieved from

http://www.jstor.org.lib-ezproxy.tamu.edu:2048/stable/23478181

Muñoz, J. M. E. (2010). Secondary education teacher training: Teaching content and teacher's learning. [La formación del profesorado de educación secundaria: Contenidos y aprendizajes docentes] *Revista De Educacion, 351,* 79-103.

Myers, E., Jr. (1996). Early field experience: A question of effectiveness. *The Teacher Educator, 31*(3), 226-237. doi:10.1080/08878739609555114

Nagy, K., Collins, A., Duschl, R., & Erduran, S. (1999). Changes in science teachers' practice& beliefs: Progress toward implementing standards based reforms. Paper presented at e *The Annual Conference of the National Association for Research in Science Teaching,* Boston, MA. Retrieved from http://lib ezproxy.tamu.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true &db=eric&AN=ED443697&site=ehost-live

National Academy of Sciences. (2003). *Evaluating and improving undergraduate teaching in science, technology, engineering and mathematics*. Washington, D. C.: National Academies Press. doi:10.1037/e378032004 001

National Academy of Sciences. (2007). *Rising above the gathering storm: Energizing and employing America for a brighter economic future*. Washington, DC: National Academies Press.

National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform.* (RIE No. ED226006). Washington, DC: U.S. Department of Education. Retrieved rom http://eric.ed.gov/?id=ED226006

National Council on Teacher Quality. (2011a). *NCTQ standards for rating the nation's education schools*. Washington, DC: National Council on Teacher Quality. Retrieved from http://www.nctq.org/standardsDisplay.do

National Council on Teacher Quality. (2011b). *Tomorrow's teachers: Review of the nation's education schools.* Washington, C: ational ouncil n eacher Quality. Retrieved from http://www.nctq.org/edschoolreports/national/

National Research Council. (1999). *Transforming undergraduate education in science, mathematics, engineering and technology.* Washington, D. C.: National Academies Press.

National Research Council. (2010). *Preparing teachers: Building evidence for sound policy*. Washington, DC: National Academies Press.

Niess, M. L., & Scholz, J. M. (1999). Incorporating subject matter specific teaching strategies into secondary science teacher preparation. In J. Gess-Newsome, & N. G. Lederman (Eds.), *Examining pedadgogical content knowledge* (pp. 257-276). Dordrecht, The Netherlands: Kluwer.

Nottis, K., Feuerstein, A., & Murray, J. (2000). The teacher belief inventory: Measuring the theoretical and practical orientations of preservice teachers. *Education (Chula Vista, Calif.), 121*(1), 90-101.

Nuangchalerm, P., & Prachagool, V. (2010). Influences of teacher preparation program on preservice science teachers' beliefs. *International Education Studies, 3*(1), 87-91.

doi:10.5539/ies.v3n1p87

Ong'ondo, C. O., & Jwan, J. O. (2009). Research on student teacher learning, collaboration and supervision during the practicum: A literature review. *Educational Research and Reviews, 4*(11), 515-524.

Plecki, M. L., Elfers, A. M., & Nakamura, Y. (2012). Using evidence for teacher education program improvement and accountability: An illustrative case of the role of value-added measures. *Journal of Teacher Education, 63*(5), 318-334. doi:10.1177/0022487112447110

Plourde, L. A. (2002). The influence of student teaching on preservice elementary teachers' science self-efficacy and outcome expectancy beliefs. *Journal of Instructional Psychology, 29*(4), 245-253.

President Obama highlights Michigan education program to improve preparation of math and science teachers. (2010, Jan 06). *PR Newswire*

Rieg, S. A., & Wilson, B. A. (2009). An investigation of the instructional pedagogy and assessment strategies used by teacher educators in two universities within a state system of higher education. *Education (Chula Vista, Calif.), 130*(2), 277-294.

Samimi-Duncan, S., Duncan, G. W., & Lancaster, J. (2010). The factors that facilitate and impede collaboration between pre-service teachers during a paired-practicum in a school-based environment. *International Journal of Learning, 17*(3), 143-162.

Savery, J. R. (2006). Overview of problem based arning: efinitions anddistinctions. *Interdisciplinary Journal of Problem Based Learning, 1*(1), 20. doi:10.7771/1541 5015.1002

Savery, J. R., & Duffy, T. M. (1995). Problem-based learning: An instructional model and its

constructivist framework. *Educational Technology, 35*(5), 31-38.

Scott, T. P., Milam, J. L., Stuessy, C. L., Blount, K. P., & Bentz, A. (2006). Math and science scholars (MASS) program: A model program for the recruitment and retention of preservice mathematics and science teachers. *Journal of Science Teacher Education, 17*(4), 389-411. doi:10.1007/s10972-006-9026-3

Seymour, E. (2001). Tracking the processes of change in US undergraduate education in science, mathematics, engineering, and technology. *Science Education, 86*(1), 79-105. doi:10.1002/sce.1044

Shea, K. A. (2006). *An examination of the perceived teaching competencies of novice alternatively licensed and traditionally licensed high school science teachers* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text.(3221071).

Sheehan, K. B. (2001). E-mail survey response rates: A review. *Journal of Computer Mediated Communication, 6*(2), doi:10.1111/j.1083 6101.2001.tb00117.x

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14. doi:10.3102/0013189x015002004

Shulman, L. S. (2000). Teacher development: Roles of domain expertise and pedagogical knowledge. *Journal of Applied Developmental Psychology, 21*(1), 129 135.

Simms, R. L., & Ponder, G. A. (1997). Using schooling and technology to learn to teach in the 21st century. *Educational Media International, 34*(2), 94-96. doi:10.1080/0952398970340210

Singer, N. R., Catapano, S., & Huisman, S. (2010). The university's role in preparing teachers

for urban schools. *Teaching Education, 21*(2), 119-130.

doi:10.1080/10476210903215027

Smith, L. K., & Gess-Newsome, J. (2004). Elementary science methods courses and the

national science education standards: Are we adequately preparing teachers? *Journal*

of Science Teacher Education, 15(2), 91-110.

doi:10.1023/b:jste.0000044867.21773.7c

Smith, S. B., Smith, S. J., & Boone, R. (2000). Increasing access to teacher preparation: The

effectiveness of traditional instructional methods in an online learning environment.

Journal of Special Education Technology, 15(2), 37-46.

Stamopoulos, E. (2006). Empowering pre service teachers to embrace diversity.

Australian Journal of Early Childhood, 31(4), 30 39.

Stevenson, K. R. (1997). Technology and teacher eparation: our itical issues.

Teaching Education (Columbia, S.C.), 8, 3 8.

Sykes, G., Bird, T., & Kennedy, M. (2010). Teacher education: Its problems and some

prospects. *Journal of Teacher Education, 61*(5), 464-476.

doi:10.1177/0022487110375804

Tanner, K., & Allen, D. (2006). Approaches to biology teaching and learning: On integrating

pedagogical training into the graduate experiences of future science faculty. *Cell*

Biology Education, 5(1), 1-6. doi:10.1187/cbe.05-12-0132

Terry, J. D. (2004). *The effects of short term teacher preparation on the efficacy of*

mathematics teachers in Teach for America (Doctoral Dissertation). Available

from ProQuest Dissertations & Theses Full Text. (3141228).

Texas Higher Education Coordinating Board. (2009). *Texas college and career readiness*

   standards. Austin, TX: The University of Texas.

Texas Higher Education Coordinating oard. (2011). *Texas higher educationdata.*

   (http://www.txhighereddata.org/ ed.)

Thach, L. (1995). Using electronic mail to conduct survey research. *Educational*

   Technology, 35, 27.

Thomas, A., & Loadman, W. E. (2001). Evaluating teacher education programs usinga

   national survey. *The Journal of Educational Research, 94*(4), 195 206.

   doi:10.1080/00220670109598753

Tillotson, J. W. (1996). *A study of the links between features of a science teacher*

   preparation program and new teacher performance with regard to constructivist

   teaching (Doctoral Dissertation). Available from ProQuest Dissertations & Theses

   Full Text.(9715205).

Tschannen-Moran, M., Woolfolk - Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its

   meaning and measure. *Review of Educational Research, 68*(2), 202-248.

   doi:10.3102/00346543068002202

Ure, C. L. (2010). Reforming teacher education through a professionally applied studyof

   teaching. *Journal of Education for Teaching, 36*(4), 461 475.

   doi:10.1080/02607476.2010.513860

Uy, E. (2009). NSF-funded program could be model for STEM teacher prep. *Education*

   Daily, 42(17), 3.

Washburn, M.,Jr. (2008). *Effects of an advanced mathematics education graduate*

   program on teacher practice (Doctoral Dissertation). Available from ProQuest

   Dissertations & Theses Full Text. (3350605).

Whitfield, J., Scott, T. P., Wilding, L. & Bentz, A. (2014). aggieTEACH history [Webpage]. Retrieved from http://aggieteach.tamu.edu/about-aggieteach.shtml

Whitney, L., Golez, F., & Nagel, G. (2002). Listening to voices of practicing teachers to examine the effectiveness of a teacher education program. *Action in Teacher Education, 23*(4), 69-76. doi:10.1080/01626620.2002.10463090

Wigle, S. E., & White, G. T. (1998). Conceptual frameworks, portfolio assessment and faculty mentoring: Bridges to standards-based teacher education programs. *Action in Teacher Education, 20*(3), 39-49. doi:10.1080/01626620.1998.10462924

Williams, H. S., & Alawiye, O. (2001). Student teachers perceptions of a teacher training program. *College Student Journal, 35*(1), 113-118.

Wilson, J.D . 1993). *An evaluation of the field experiences of the innovative model for the preparation of elementary teachers for science, mathematics, and technology* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text.(9327797).

Wilson, J. D. (1996). An evaluation of the field experiences of the innovative model for the preparation of elementary teachers for science, mathematics, and technology.*Journal of Teacher Education, 47*(1), 53-59. doi:10:1177/0022487196047001009

Wilson, S. M., Floden, R. E., & errini Mundy, . 2001, ebruary). *Teacher preparation research: Current knowledge, gaps, and recommendations.* (Document No. R 01 03). Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.

Wineburg, M. S. (2006). idence n acher eparation. *Journal of TeacherEducation, 57*(1), 64. doi:10.1177/0022487105284475

Woodrow, J. E. J., Mayer-Smith, J. A., & Pedretti, E. G. (2000). Assessing technology enhanced instruction: A case study in secondary science. *Journal of Educational Computing Research, 23*(1), 15-39. doi:10.2190/ax3r-a8t1-h5a3-810h

Yakar, Z. (2007). *A study of the effectiveness of a four semester preservice secondary science teacher education program regarding changes in teacher perceptions and practices* (Doctoral Dissertation). Available from ProQuest Dissertations & Theses Full Text. (3266017).

Zeichner, K. M. (2006). Reflections of a university-based teacher educator on the future of college-and university-based teacher education. *Journal of Teacher Education, 57*(3), 326-340. doi:10.1177/0022487105285893

Zeichner, K. M. (2007). Accumulating knowledge across self-studies in teacher education. *Journal of Teacher Education, 58*(1), 46. doi:10.1177/0022487106296219

Zeichner, K. M. (2010a). Competition, economic rationalization, increased surveillance, and attacks on diversity: Neo-liberalism and the transformation of teacher education in the U.S. *Teaching and Teacher Education, 26*(8), 1544 1552. doi:10.1016/j.tate.2010.06.004

Zeichner, K. M. (2010b). Rethinking the connections between campus courses and field experiences in college- and university-based teacher education. *Journal of Teacher Education, 61*(1-2), 89-99. doi:10.1177/0022487109347671

Zeichner, K. M., & Conklin, H. G. (2005). Teacher education programs. In M. Cochran-Smith, & K. M. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education* (1st ed., pp. 645-735). Mahwah, NJ: Lawrence Erlbaum.

Zeichner, K. M., & Paige, L. (2008). The current status and possible future for 'traditional'

　　college and university-based teacher education programs in the US. *21st Century*

　　Education: A Reference Handbook, 2, 33-42. doi:10.4135/9781412964012

Zientek, L. R. (2006). Do teachers differ by certification route? Novice teachers' sense of

　　self-efficacy, commitment to teaching, and preparedness to teach. *School Science and*

　　Mathematics, 106(8), 326-327. doi:10.1111/j.1949-8594.2006.tb17752.x

APPENDIX A

TEXAS A&M UNIVERSITY DIVISION OF RESEARCH - OFFICE OF RESEARCH

COMPLIANCE AND BIOSAFETY

1186 TAMU, General Services Complex   979.458.1467

College Station, TX 77843-1186   FAX 979.862.3176

750 Agronomy Road, #3501   http://researchcompliance.tamu.edu

---

Human Subjects Protection   **Institutional Review Board**

Program

APPROVAL   23-Jul-2012

DATE:

MEMORANDUM

TO: WAXMAN, HERSH C 77843-4232

FROM: Office of Research Compliance Institutional Review Board

SUBJECT: Initial Review

Protocol   2012-0360

Number:

Review Category: Exempt from IRB Review

Title   Examining a Texas A&M University teacher preparation program

participants' perceptions and efficacy in knowing and understanding

the standards for K-12 student instruction: A comparison between

current and former student and mentor teacher participants'

perceptions

It has been determined that the referenced protocol application meets the criteria for

exemption and no further review is required. However, any amendment or modification to

the protocol must be reported to the IRB and reviewed before being implemented to ensure

the protocol still meets the criteria for exemption.

This determination was based on the following Code of Federal Regulations:

(http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm)

45 CFR 46.101(b)(4) Research involving the collection or study of existing data, documents,

records, pathological specimens, or diagnostic specimens, if these sources are publicly

available or if the information is recorded by the investigator in such a **manner that subjects**

cannot be identified, directly or through identifiers linked to the subjects.

Provisions:	
Comments:	Waiver of Informed Consent (45 CFR 46.116(d)): the research involves no more than minimal risk to subjects; the waiver or alteration will not adversely affect the rights and welfare of the subjects; the research could not practicably be carried out without the waiver or alteration; and whenever appropriate, the subjects will be provided with additional pertinent information after participation

APPENDIX B

SECONDARY MATHEMATICS AND SCIENCE TEACHER EDUCATION

PROGRAM COMPARISON CHART

TAMU Program Titles

Characteristics*	aggieTEACH	Secondary Graduate Certification	Accelerate-Online
Participants	Undergraduate students	Graduate students and approved senior undergraduates	Undergraduates and graduate students
Currently Enrolled math/science Participants	265	~8	~15
Grade 8 – 12 Certification Areas	Chemistry, Life Science, Math, Math/Physics, Physical Science, Science,	Chemistry, ELA, History, Life Science, Math, Math/Physics, Physical Science, Science, Social Studies	Chemistry, Chinese, ELA, History, Life Science, Math, Math/Physics, Physical Science, Science, Social Studies
Internship Opportunity	No	Yes	Yes
Early Field Experience Opportunity	Yes	No	Yes
Student Teaching Opportunity	Yes	Yes	Yes
Total # of Certified Participants	~312 Since 2001	~45 Since 2006	~61 Since 2006

*As of Fall 2011

APPENDIX C

INSTRUMENT SUMMARY CHART

Working Instrument Title	Respondents	Data Type	Description
TAMU Self-Assessment Tool – Current Students	Current student teachers	Quantitative & Qualitative	Assesses development of confidence in skills and knowledge to teach secondary English language arts, mathematics, science, and social studies. Captures participant beliefs about program characteristics and experiences with state standards.
TAMU Self-Assessment Tool – Former Students	Former program participants		

Teacher Preparation Program Self-Assessment Current Students

You are being invited to take part in a research study being conducted by Texas A&M University and asked to read this form so that you know about this research study. The information in this form is provided to help you decide whether or not to take part. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefit you normally would have.

WHY IS THIS STUDY BEING DONE?
The purpose of the TAMU Educator Preparation Collaborative for Enhancing College and Career Readiness in Texas Schools (TAMU Collaborative) is to prepare P-16 education professionals to assist students in meeting college and career readiness and skilled workforce expectations and standards.

WHY AM I BEING ASKED TO BE IN THIS STUDY?
You are being asked to participate in this study because of your affiliation with a teacher preparation program in the state of Texas. This study is being funded by the Texas Higher Education Coordinating Board (THECB).

HOW MANY PEOPLE WILL BE ASKED TO BE IN THIS STUDY?
Approximately 750 people from teacher preparation programs in the state of Texas will be asked to participate in this study.

WHAT ARE THE ALTERNATIVES TO BEING IN THIS STUDY?
The alternative is to not participate.

WHAT WILL YOU BE ASKED TO DO IN THIS STUDY?
Your participation in this study will include completing an online survey that will take approximately 30 minutes to complete. As you complete the survey, you will have the option to save and resume later.

ARE THERE ANY RISKS TO ME?
The things that you will be doing have no more risk than you would encounter in everyday life.

ARE THERE ANY BENEFITS TO ME?
There may be no direct benefit to you from being in this study. What the researchers learn from thisstudy may help improve the quality of teacher preparation programs in the state of Texas.

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 receive a $25 gift card for your participation in this study.

WILL INFORMATION FROM THIS STUDY BE KEPT PRIVATE?
The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only researchers at the State of Texas Education Research Center at Texas A&M University will have access to the records.

Information about you will be stored in computer files protected with a password.

Information about you will be kept confidential to the extent permitted or required by law. People who have access to your information include the Principal Investigator and research study personnel. 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 your records to make sure the study is being run correctly and that information is collected properly.
The agency that funds this study, THECB, and the institution(s) where study procedures are being performed, Texas A&M University, may also see your information. However, any information that is sent to them will be coded with a number so that they cannot tell who you are. Representatives from these entities can see information that has your name on it if they come to the study site to view records. If there are any reports about this study, your name will not be in them.

WHOM CAN I CONTACT FOR MORE INFORMATION?
You can contact the Principal Investigator to tell him about a concern or complaint about this researchstudy. The Principal Investigator, Hersh Waxman, PhD, can be reached at 979-458-4159 or emailed at hwaxman@tamu.edu.

For questions about your rights as a research participant, or if you have questions, complaints, orconcerns about the research and cannot reach the Principal Investigator or want to talk to someone other than the Investigator, you may call the Texas A&M Human Subjects Protection Program office.

Phone number: (979) 458-4067 Email: irb@tamu.edu

MAY I CHANGE MY MIND ABOUT PARTICIPATING?

You have the choice whether or not to be in this research study. You may decide to not begin or to stop the study at any time. If you choose not to be in this study, there will be no effect on your employment. You can stop being in this study at any time with no effect on your relationship with your place of employment or Texas A&M University.

By participating in this annual survey, you are giving permission for the investigator to use your information for research purposes.

Thank you.

Hersh Waxman, PhD
State of Texas Education Research Center at Texas A&M University

1. **After reading the information provided above, please indicate if you would like to participate in the study.**
   ❑❑ *I would like to participate in the study by completing the online survey.*
   ❑❑ *I choose **NOT** to participate in the study.*

2. **Sex**
   ❑❑ *Male*
   ❑❑ *Female*

3. **Ethnicity**
   ❑❑ *African American*
   ❑❑ *American Indian or Alaskan Native*
   ❑❑ *Asian*
   ❑❑ *Latino(a)*
   ❑❑ *Multiethnic*
   ❑❑ *White, not of Hispanic origin Other (please specify)*

4. **In which of the following teacher preparation programs are you currently participating?**
   ❑❑ *Accelerate Online*
   ❑❑ *AggieTEACH*
   ❑❑ *Secondary Graduate Certification Program*

5. **Which of the following certifications do you currently have or are you currently pursuing through your teacher preparation program? (Mark all that apply)**
   ❑❑ *Chemistry (8-12)*
   ❑❑ *Communications (8-12)*
   ❑❑ *English/Language Arts (8-12)*
   ❑❑ *German (6-12)*
   ❑❑ *History (8-12)*
   ❑❑ *Latin (6-12)*
   ❑❑ *Life Science (8-12)*
   ❑❑ *Mathematics (8-12)*
   ❑❑ *Mathematics/Physics (8-12)*
   ❑❑ *Physical Science (8-12)*

164

❑❑ *Physics (8-12)*
❑❑ *Science Composite (8-12)*
❑❑ *Social Studies Composite (8-12)*
❑❑ *Spanish (6-12) Other   (please specify)*

6. Which of the following will you complete to in order fulfill the requirements of your teacher preparation program?

❑❑ *Student teaching*
❑❑ *A year-long, paid internship where you are the teacher of record*

7. Please indicate the extent to which you agree with the following items regarding prerequisite courses:

	Strongly disagree	Disagree	Agree	Strongly agree
Overall, my prerequisite education courses for this program provided foundational knowledge of the teaching profession.	❑❑	❑❑	❑❑	❑❑
Overall, my prerequisite education courses for this program were necessary to my success as a teacher.	❑❑	❑❑	❑❑	❑❑
Overall, my prerequisite content area courses for this program provided an in-depth understanding of my area of certification.	❑❑	❑❑	❑❑	❑❑
Overall, my prerequisite content area courses for this program were necessary to my success as a teacher.	❑❑	❑❑	❑❑	❑❑

8. Please indicate the extent to which you agree with the following items regarding field experiences:

(***Note.*** **Field experiences are student placements in designated classrooms for the purpose of observing experienced teachers, typically to fulfill a course requirement. Field experiences do NOT include student teaching or teaching internships.**)

	Strongly disagree	Disagree	Agree	Strongly agree
I had at least one opportunity to observe an effective teacher.	❑❑	❑❑	❑❑	❑❑
I had at least one opportunity to observe an ethnically diverse classroom.	❑❑	❑❑	❑❑	❑❑
Overall, my assigned field experiences were with teachers who were in my content area.	❑❑	❑❑	❑❑	❑❑
Overall, my mentor teachers increased my knowledge of effective instructional practices.	❑❑	❑❑	❑❑	❑❑
Overall, I had the opportunity to practice instructional strategies specific to my content area.	❑❑	❑❑	❑❑	❑❑
Overall, my field experience opportunities adequately prepared me for entering a classroom as a first-year teacher.	❑❑	❑❑	❑❑	❑❑

9. **In thinking about your experience as a student teacher, please indicate the extent to which you agree with the following statements:**

	Strongly disagree	Disagree	Agree	Strongly agree
My student teaching experience closely resembles the type of classroom (i.e., student demographics, location) in which I plan to teach.	❏❏	❏❏	❏❏	❏❏
My student teaching experience will help in facilitating a smooth transition to my first year of teaching	❏❏	❏❏	❏❏	❏❏
I had ample opportunities to practice a variety of instructional strategies.	❏❏	❏❏	❏❏	❏❏
Overall, my student teaching experience gave me the confidence to believe that I will be a successful teacher.	❏❏	❏❏	❏❏	❏❏
If I could start over, I would choose to complete student teaching instead of a teaching internship.	❏❏	❏❏	❏❏	❏❏

10. **In thinking about your experience as a student teacher, please indicate the extent to which you agree with the following statements:**

	Strongly disagree	Disagree	Agree	Strongly agree
	❏❏	❏❏	❏❏	❏❏
In terms of student demographics, my teaching internship resembled at least one of the classrooms I observed during my field experiences.				
My coursework prepared me for my teaching internship.	❏❏	❏❏	❏❏	❏❏
During my teaching internship, I had ample opportunities to implement a variety of instructional strategies.	❏❏	❏❏	❏❏	❏❏
Overall, my teaching internship provided me with the confidence to believe that I will be a successful teacher.	❏❏	❏❏	❏❏	❏❏
If I could start over, I would choose to complete a teaching internship, instead of student teaching.	❏❏	❏❏	❏❏	❏❏

11. **Please indicate your level of confidence in your ability to do the following:**

	Not at all confident	Somewhat confident	Confident	Extremely confident
Establish and maintain effective classroom management	❏❏	❏❏	❏❏	❏❏
Create a lesson plan	❏❏	❏❏	❏❏	❏❏
Develop strategies for working with parents and families	❏❏	❏❏	❏❏	❏❏
Recognize and respect individual family differences	❏❏	❏❏	❏❏	❏❏
Conduct parent/family-teacher conferences	❏❏	❏❏	❏❏	❏❏
Integrate multiple subject areas	❏❏	❏❏	❏❏	❏❏
Differentiate instruction for all students	❏❏	❏❏	❏❏	❏❏
Create a learning environment that encourages	❏❏	❏❏	❏❏	❏❏

students to appreciate cultural diversity				
Integrate technology in the delivery of instructional content	❏❏	❏❏	❏❏	❏❏
Use manipulatives across subject areas to teach concepts	❏❏	❏❏	❏❏	❏❏
Use a variety of instructional strategies to facilitate increased reading comprehension	❏❏	❏❏	❏❏	❏❏
Teach reading in my content area	❏❏	❏❏	❏❏	❏❏
Cultivate relationships with students	❏❏	❏❏	❏❏	❏❏
Maintain student engagement during instruction	❏❏	❏❏	❏❏	❏❏
Develop assessments that accurately reflect student learning	❏❏	❏❏	❏❏	❏❏
Use formative assessments to guide instruction	❏❏	❏❏	❏❏	❏❏
Use summative assessments to guide instruction	❏❏	❏❏	❏❏	❏❏
Facilitate small group instruction	❏❏	❏❏	❏❏	❏❏
Provide instruction aligned with the College and Career Readiness Standards (CCRS)	❏❏	❏❏	❏❏	❏❏
Provide instruction aligned with Texas Essential Knowledge and Skills (TEKS)	❏❏	❏❏	❏❏	❏❏
Provide instruction aligned with national teaching standards	❏❏	❏❏	❏❏	❏❏

12. Please indicate your level of confidence in your ability to do the following in mathematics:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Assess the different ways students solve problems	❏❏	❏❏	❏❏	❏❏
Use representations (e.g., geometric representation, graphs, number lines) to show why a procedure works	❏❏	❏❏	❏❏	❏❏
Explain how to arrive at a solution to a problem	❏❏	❏❏	❏❏	❏❏
Choose appropriate mathematics curriculum materials	❏❏	❏❏	❏❏	❏❏
Use technology (e.g., graphing calculators, Geometer's Sketchpad) for the purpose of teaching mathematics	❏❏	❏❏	❏❏	❏❏
Make mathematical connections to the real world	❏❏	❏❏	❏❏	❏❏

13. Please indicate your level of confidence in *preparing your students* to do the following in mathematics:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Develop a plan to solve a problem	❏❏	❏❏	❏❏	❏❏
Use logical reasoning to solve problems	❏❏	❏❏	❏❏	❏❏
Connect mathematics to real life	❏❏	❏❏	❏❏	❏❏
Connect mathematics to other content areas	❏❏	❏❏	❏❏	❏❏
Conduct research (i.e., collect, describe, and analyze data)	❏❏	❏❏	❏❏	❏❏
Communicate mathematical ideas	❏❏	❏❏	❏❏	❏❏

| Use technology to solve mathematical problems (e.g., graphing calculators, Geometer's Sketchpad) | ❏❏ | ❏❏ | ❏❏ | ❏❏ |

14. Please indicate your level of confidence in your ability to do the following in science:

	Not at all confident	*Somewhat confident*	*Confident*	*Extremely confident*
Manage a classroom of students engaged in laboratory activities	❏❏	❏❏	❏❏	❏❏
Consider students' prior conceptions about natural phenomena when planning instruction	❏❏	❏❏	❏❏	❏❏
Facilitate student-led inquiry activities	❏❏	❏❏	❏❏	❏❏
Conduct teacher-guided inquiry activities	❏❏	❏❏	❏❏	❏❏
Apply science concepts to real and authentic life scenarios	❏❏	❏❏	❏❏	❏❏
Teach students how to interpret graphs	❏❏	❏❏	❏❏	❏❏
Identify student misconceptions	❏❏	❏❏	❏❏	❏❏

15. Please indicate your level of confidence in preparing your students to do the following in science:

	Not at all confident	*Somewhat confident*	*Confident*	*Extremely confident*
Think scientifically about natural phenomena	❏❏	❏❏	❏❏	❏❏
Design safe scientific investigations	❏❏	❏❏	❏❏	❏❏
Use current technology to learn about scientific concepts	❏❏	❏❏	❏❏	❏❏
Communicate scientific information	❏❏	❏❏	❏❏	❏❏
Apply mathematical concepts in science	❏❏	❏❏	❏❏	❏❏
Comprehend scientific articles	❏❏	❏❏	❏❏	❏❏
Apply research skills in science	❏❏	❏❏	❏❏	❏❏
Recognize themes (e.g., states of matter, energy, change over time) across the scientific disciplines	❏❏	❏❏	❏❏	❏❏
Recognize the role of science in society	❏❏	❏❏	❏❏	❏❏
Analyze the structure of science content	❏❏	❏❏	❏❏	❏❏
Formulate explanations for scientific results	❏❏	❏❏	❏❏	❏❏
Interpret Data	❏❏	❏❏	❏❏	❏❏

16. Please indicate your level of confidence in your ability to do the following in reading/language arts:

	Not at all confident	*Somewhat confident*	*Confident*	*Extremely confident*
Analyze literature	❏❏	❏❏	❏❏	❏❏
Build student motivation to read	❏❏	❏❏	❏❏	❏❏
Model the writing process (i.e., drafting, editing, and revising)	❏❏	❏❏	❏❏	❏❏
Teach students to apply various strategies to interpret a writer's purpose	❏❏	❏❏	❏❏	❏❏
Expose students to a wide range of literary genres	❏❏	❏❏	❏❏	❏❏

	Not at all confident	Somewhat confident	Confident	Extremely confident
Teach grammar in context	❏❏	❏❏	❏❏	❏❏

17. Please indicate your level of confidence in preparing your students to do the following in reading/language arts:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Write in a focused and coherent manner	❏❏	❏❏	❏❏	❏❏
Critically analyze a variety of literary genres	❏❏	❏❏	❏❏	❏❏
Analyze the influence of classic literature from a variety of cultures on later literature	❏❏	❏❏	❏❏	❏❏
Utilize the elements of communication	❏❏	❏❏	❏❏	❏❏
Deliver focused and coherent presentations	❏❏	❏❏	❏❏	❏❏
Apply listening skills in a variety of settings	❏❏	❏❏	❏❏	❏❏
Apply research skills in reading/language arts	❏❏	❏❏	❏❏	❏❏

18. Please indicate your level of confidence in your ability to do the following in social studies:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Include time for students to present relevant, student-created products to the class	❏❏	❏❏	❏❏	❏❏
Discuss multiple perspectives when addressing social studies topics	❏❏	❏❏	❏❏	❏❏
Use technology (e.g., Google Earth, PowerPoint) within social studies lessons	❏❏	❏❏	❏❏	❏❏
Integrate current events in social studies lessons	❏❏	❏❏	❏❏	❏❏

19. Please indicate your level of confidence in in preparing your students to do the following in social studies:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Develop logical contexts for recognizing themes in social studies	❏❏	❏❏	❏❏	❏❏
Comprehend current event articles (e.g., newspaper, magazine)	❏❏	❏❏	❏❏	❏❏
Provide examples of social studies within other content areas	❏❏	❏❏	❏❏	❏❏
Integrate real-life examples in social studies discussions	❏❏	❏❏	❏❏	❏❏
Recognize chronological relationships in social studies topics	❏❏	❏❏	❏❏	❏❏
Use technology to further the understanding of social studies concepts (e.g., Google Earth, PowerPoint)	❏❏	❏❏	❏❏	❏❏

20. Which of the following will you complete to in order fulfill the requirements of your teacher preparation program?

❏❏ *Yes*

❏❏ *No*

21. If "Yes".Please indicate the extent to which you agree with the following statements regarding the online/hybrid courses in which you participated:

	Strongly disagree	Disagree	Agree	Strongly agree
The classes were well organized.	❏❏	❏❏	❏❏	❏❏
The instructor provided prompt feedback.	❏❏	❏❏	❏❏	❏❏
I had the opportunity to interact with other students in the course through online discussions, group projects, etc.	❏❏	❏❏	❏❏	❏❏
The classes were challenging.	❏❏	❏❏	❏❏	❏❏
The classes were **NOT** repetitive of courses I had already taken.	❏❏	❏❏	❏❏	❏❏
Online discussions contributed to my knowledge about teaching.	❏❏	❏❏	❏❏	❏❏

22. Please indicate your level of confidence in your ability to do the following with English as a Second Language (ESL) students:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Integrate social language instruction with academic language instruction	❏❏	❏❏	❏❏	❏❏
Plan instruction that recognizes different proficiency levels within the language domains of listening, speaking, reading, and writing	❏❏	❏❏	❏❏	❏❏
Plan activities that allow students to demonstrate their knowledge on a topic, regardless of their English proficiency levels	❏❏	❏❏	❏❏	❏❏
Use English language learners' primary language as an instructional tool	❏❏	❏❏	❏❏	❏❏
Communicate with the families of English language learners	❏❏	❏❏	❏❏	❏❏
Set language objectives for English language learners, regardless of content area	❏❏	❏❏	❏❏	❏❏
Teach students whose primary language is not English	❏❏	❏❏	❏❏	❏❏

23. My teacher preparation program provided instruction about the following regarding teaching special populations:

	Strongly disagree	Disagree	Agree	Strongly agree
The process for referring students for special education services	❏❏	❏❏	❏❏	❏❏
The legal and ethical obligation of general education teachers to participate in the Individualized Education Plan (IEP) process	❏❏	❏❏	❏❏	❏❏
Student growth and development	❏❏	❏❏	❏❏	❏❏

	Strongly disagree	Disagree	Agree	Strongly agree
Strategies to ensure that students with disabilities are integrated into the classroom	❑❑	❑❑	❑❑	❑❑
The use of resources for assessing and educating students with individual needs in the general education classroom	❑❑	❑❑	❑❑	❑❑

24. **Please indicate the extent to which you agree with the following items regarding professionalism/professional growth:**

	Strongly disagree	Disagree	Agree	Strongly agree
Program advisors/faculty in my teacher preparation program provided assistance in creating a résumé.	❑❑	❑❑	❑❑	❑❑
Program advisors/faculty in my teacher preparation program helped prepare me for job interviews.	❑❑	❑❑	❑❑	❑❑
My teacher preparation program offered information regarding career opportunities	❑❑	❑❑	❑❑	❑❑
My teacher preparation program prepared me to pass the Professional and Pedagogy and Responsibilities (PPR) test.	❑❑	❑❑	❑❑	❑❑
My teacher preparation program fostered collaboration among participants.	❑❑	❑❑	❑❑	❑❑
My teacher preparation program facilitated opportunities for me to collaborate with teachers in the field.	❑❑	❑❑	❑❑	❑❑
My teacher preparation program introduced me to professional organizations pertinent to my content area/field.	❑❑	❑❑	❑❑	❑❑
My teacher preparation program introduced me to research-based articles related to my content area/field.	❑❑	❑❑	❑❑	❑❑

25. **In thinking about your experience as a student teacher or an intern, please indicate the extent to which you agree with the following statements regarding mentor teachers/university supervisors:**

	Strongly disagree	Disagree	Agree	Strongly agree
My campus mentor teacher/cooperating teacher helped me solve problems as they arose.	❑❑	❑❑	❑❑	❑❑
My campus mentor teacher/cooperating teacher assisted me in finding useful materials and resources.	❑❑	❑❑	❑❑	❑❑
My campus mentor teacher/cooperating teacher provided me with frequent, helpful feedback and ideas.	❑❑	❑❑	❑❑	❑❑
My campus mentor teacher/cooperating teacher was easily accessible.	❑❑	❑❑	❑❑	❑❑

	Strongly disagree	Disagree	Agree	Strongly agree
My university supervisor visited my classroom on a regular basis.	❑	❑❑	❑❑	❑❑
My university supervisor assisted me with classroom management techniques.	❑❑	❑❑	❑❑	❑❑
My university supervisor helped me improve my teaching skills.	❑❑	❑❑	❑❑	❑❑

26. Please indicate the extent to which you agree with the following items regarding your university instructors:

	Strongly disagree	Disagree	Agree	Strongly agree
Overall, my instructors were knowledgeable about the latest trends in curriculum and instruction.	❑❑	❑❑	❑❑	❑❑
Overall, my instructors were knowledgeable about the realities of teaching in the current classroom climate.	❑❑	❑❑	❑❑	❑❑
Overall, my instructors were accessible.	❑❑	❑❑	❑❑	❑❑
Overall, my instructors seemed to care about me as an individual.	❑❑	❑❑	❑❑	❑❑
Overall, my instructors gave assignments that connected coursework with my field experiences.	❑❑	❑❑	❑❑	❑❑
Overall, my instructors used various forms of media (e.g., video conferencing tools, watching videos) to enhance my understanding of instructional concepts.	❑❑	❑❑	❑❑	❑❑

27. Please indicate the extent to which you agree with the following items regarding your current school climate/environment:

	Strongly disagree	Disagree	Agree	Strongly agree
Teachers in my school work together to improve student learning.	❑❑	❑❑	❑❑	❑❑
Teachers in my school trust each other.	❑❑	❑❑	❑❑	❑❑
Teachers in my school use time together to discuss teaching and learning.	❑❑	❑❑	❑❑	❑❑
Teachers in my school feel responsible to help each other do their best.	❑❑	❑❑	❑❑	❑❑
Teachers in my school work especially hard with lower-achieving students.	❑❑	❑❑	❑❑	❑❑
Teachers in my school are confident they will be able to motivate their students.	❑❑	❑❑	❑❑	❑❑
Teachers in my school try to help **ALL** students succeed.	❑❑	❑❑	❑❑	❑❑
Teachers in my school continue to consider the instructional needs of a child, even when it seems that child does not want to learn.	❑❑	❑❑	❑❑	❑❑

28. Please indicate the extent to which you agree with the following items regarding reflections/future aspirations:

	Strongly disagree	Disagree	Agree	Strongly agree
If I could start over, I would choose education as my program of study.	❑❑	❑❑	❑❑	❑❑
If I could start over, I would choose to participate in my current teacher preparation program.	❑❑	❑❑	❑❑	❑❑
Immediately upon completing the requirements for certification, I plan to obtain a full-time teaching position in my certification area.	❑❑	❑❑	❑❑	❑❑
Three years after becoming certified, I plan to still be a classroom teacher.	❑❑	❑❑	❑❑	❑❑
Ten years after becoming certified, I plan to still be a classroom teacher.	❑❑	❑❑	❑❑	❑❑
At some point in the future, I plan to attend graduate school for an advanced degree in education.	❑❑	❑❑	❑❑	❑❑

29. Please describe those experiences during your teacher preparation program which you found to be the most helpful or relevant for classroom teaching. Please elaborate.

30.   **What suggestions would you make for changing or improving your teacher preparation program? Please provide specific examples.**

_____

_____

_____

_____

31. **Pleaes provide any additional information you would like to share regarding your teacher preparation program. Please elaborate.**

_____

_____

_____

_____

32. **If you would like to receive a $25 Amazon gift card for completing the survey, please provide your name and email address.**

   *Note. This information will in no way be connected to your survey responses and will only be used for the purpose of distributing gift cards.

   Name:

   _____

   Email:

   _____

Teacher Preparation Program Self-

Assessment Former Students

You are being invited to take part in a research study being conducted by Texas A&M University and asked to read this form so that you know about this research study. The information in this form is provided to help you decide whether or not to take part. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefit you normally would have.

WHY IS THIS STUDY BEING DONE?
The purpose of the TAMU Educator Preparation Collaborative for Enhancing College and Career Readiness in Texas Schools (TAMU Collaborative) is to prepare P-16 education professionals to assist students in meeting college and career readiness and skilled workforce expectations and standards.

WHY AM I BEING ASKED TO BE IN THIS STUDY?
You are being asked to participate in this study because of your affiliation with a teacher preparation program in the state of Texas. This study is being funded by the Texas Higher Education Coordinating Board(THECB).

HOW MANY PEOPLE WILL BE ASKED TO BE IN THIS STUDY?
Approximately 750 people from teacher preparation programs in the state of Texas will be asked to participate in this study.

WHAT ARE THE ALTERNATIVES TO BEING IN THIS STUDY?
The alternative is to not participate.

WHAT WILL YOU BE ASKED TO DO IN THIS STUDY?
Your participation in this study will include completing an online survey that will take approximately 30 minutes to complete. As you complete the survey, you will have the option to save and resume later.

ARE THERE ANY RISKS TO ME?
The things that you will be doing have no more risk than you would encounter in everyday life.

ARE THERE ANY BENEFITS TO ME?
There may be no direct benefit to you from being in this study. What the researchers learn from thisstudy may help improve the quality of teacher preparation programs in the state of Texas.

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 receive a $25 gift card for your participation in this study.

WILL INFORMATION FROM THIS STUDY BE KEPT PRIVATE?
The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only researchers at the State of Texas Education Research Center at Texas A&M University will have access to the records.

Information about you will be stored in computer files protected with a password.

Information about you will be kept confidential to the extent permitted or required by law. People who have access to your information include the Principal Investigator and research study personnel. 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 your records to make sure the study is being run correctly and that information is collected properly.

The agency that funds this study, THECB, and the institution(s) where study procedures are being performed, Texas A&M University, may also see your information. However, any information that is sent to them will be coded with a number so that they cannot tell who you are. Representatives from these entities can see information that has your name on it if they come to the study site to view records. If there are any reports about this study, your name will not be in them.

WHOM CAN I CONTACT FOR MORE INFORMATION?
You can contact the Principal Investigator to tell him about a concern or complaint about this research study. The Principal Investigator, Hersh Waxman, PhD, can be reached at 979-458-4159 or emailed at hwaxman@tamu.edu.

For questions about your rights as a research participant, or if you have questions, complaints, orconcerns about the research and cannot reach the Principal Investigator or want to talk to someone other than the Investigator, you may call the Texas A&M Human Subjects Protection Program office.

Phone number: (979) 458-4067 Email: irb@tamu.edu

MAY I CHANGE MY MIND ABOUT PARTICIPATING?
You have the choice whether or not to be in this research study. You may decide to not begin or to stop the study at any time. If you choose not to be in this study, there will be no effect on your employment. You can stop being in this study at any time with no effect on your relationship with your place of employment or Texas A&M University.

By participating in this annual survey, you are giving permission for the investigator to use your information for research purposes.

Thank you.

Hersh Waxman, PhD
State of Texas Education Research Center at Texas A&M University

1. **After reading the information provided above, please indicate if you would like to participate in the study.**
   - ❑❑ *I would like to participate in the study by completing the online survey.*
   - ❑❑ *I choose **NOT** to participate in the study.*

2. **Sex**
   - ❑❑ *Male*
   - ❑❑ *Female*

3. **Ethnicity**
   - ❑❑ *African American*
   - ❑❑ *American Indian or Alaskan Native*
   - ❑❑ *Asian*
   - ❑❑ *Latino(a)*
   - ❑❑ *Multiethnic*
   - ❑❑ *White, not of Hispanic origin Other (please specify)*

4. **In which of the following teacher preparation programs are you currently participating?**
   - ❑❑ *Accelerate Online*
   - ❑❑ *AggieTEACH*
   - ❑❑ *Secondary Graduate Certification Program*

5. **Which of the following certifications do you currently have or are you currently pursuing through your teacher preparation program? (Mark all that apply)**
   - ❑❑ *Chemistry (8-12)*
   - ❑❑ *Communications (8-12)*
   - ❑❑ *English/Language Arts (8-12)*
   - ❑❑ *German (6-12)*
   - ❑❑ *History (8-12)*
   - ❑❑ *Latin (6-12)*
   - ❑❑ *Life Science (8-12)*
   - ❑❑ *Mathematics (8-12)*
   - ❑❑ *Mathematics/Physics (8-12)*
   - ❑❑ *Physical Science (8-12)*
   - ❑❑ *Physics (8-12)*

❑❑ *Science Composite (8-12)*
❑❑ *Social Studies Composite (8-12)*
❑❑ *Spanish (6-12) Other   (please specify)*

6. Which of the following will you complete to in order fulfill the requirements of your teacher preparation program?
❑❑ *Student teaching*
❑❑ *A year-long, paid internship where you are the teacher of record*

7. Which of the following best describes your current employment?
❑❑ *Classroom teacher in my content area*
❑❑ *Classroom teacher outside my content area*
❑❑ *School-based administrator (e.g., principal, counselor, school improvement   specialist)*
❑❑ *District-level administrator*
❑❑ *Employed in education, outside of PK-12 (e.g., university instructor, education service center, educational testing service, etc.)*
❑❑ *Employed outside of education*

8. After completing your teacher preparation program, how many years have or did you serve as a classroom teacher, including the 2011-2012 school year?

Note. **If you completed a year-long teaching internship in which you were the teacher of record, include this in your years of experience.**

9.   Please explain why you chose to leave the field of education.

10. Please indicate the extent to which you agree with the following items regarding prerequisite courses:

	Strongly disagree	Disagree	Agree	Strongly agree
Overall, my prerequisite **education** courses provided foundational knowledge of the teaching profession.	❑❑	❑❑	❑❑	❑❑
Overall, my prerequisite **education** courses were necessary to my success as a teacher.	❑❑	❑❑	❑❑	❑❑
Overall, my prerequisite **content area** courses provided an in-depth understanding of my area of certification.	❑❑	❑❑	❑❑	❑❑
Overall, my prerequisite **content area** courses were necessary to my success as a teacher.	❑❑	❑❑	❑❑	❑❑

11. Please indicate the extent to which you agree with the following items regarding field experiences:

(*Note.* **Field experiences are student placements in designated classrooms for the purpose of observing experienced teachers, typically to fulfill a course requirement. Field experiences do NOT include student teaching or teaching internships.)**

	Strongly disagree	Disagree	Agree	Strongly agree
I had at least one opportunity to observe an effective teacher.	❑❑	❑❑	❑❑	❑❑
I had at least one opportunity to observe an ethnically diverse classroom.	❑❑	❑❑	❑❑	❑❑
Overall, my assigned field experiences were with teachers who were in my content area.	❑❑	❑❑	❑❑	❑❑
Overall, my mentor teachers increased my knowledge of effective instructional practices.	❑❑	❑❑	❑❑	❑❑
Overall, I had the opportunity in my field experiences to practice instructional strategies specific to my content area.	❑❑	❑❑	❑❑	❑❑
Overall, my field experience opportunities adequately prepared me for entering the classroom as a first-year teacher.	❑❑	❑❑	❑❑	❑❑

12. In thinking about your experience as a student teacher, please indicate the extent to which you agree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
My student teaching experience closely resembled the type of classroom (i.e., student demographic, location) in which I teach.	❑❑	❑❑	❑❑	❑❑
My student teaching experience facilitated a smooth transition to my first year of teaching.	❑❑	❑❑	❑❑	❑❑
I had ample opportunities to practice a variety of instructional strategies during my student teaching experience.	❑❑	❑❑	❑❑	❑❑
Overall, my student teaching experience gave me the confidence to believe that I would be a	❑❑	❑❑	❑❑	❑❑

successful teacher.

	Strongly disagree	Disagree	Agree	Strongly agree
If I could start over, I would choose to complete student teaching instead of a teaching internship.	❏❏	❏❏	❏❏	❏❏

13. **In thinking about your experience as an intern, please indicate the extent to which you agree with the following statements:**

	Strongly disagree	Disagree	Agree	Strongly agree
In terms of student demographics, my teaching internship resembled at least one of the classrooms I observed during my field experiences.	❏❏	❏❏	❏❏	❏❏
My coursework prepared me for my teaching internship.	❏❏	❏❏	❏❏	❏❏
I had ample opportunities to implement a variety of instructional strategies during my teaching internship.	❏❏	❏❏	❏❏	❏❏
Overall, my teaching internship provided me with the confidence to believe that I would be a successful teacher.	❏❏	❏❏	❏❏	❏❏
If I could start over, I would choose to complete a teaching internship instead of student teaching.	❏❏	❏❏	❏❏	❏❏

14. **Please reflect back to when you completed your teacher preparation program and indicate the level of confidence you had in your ability to do the following:**

	Not at all confident	Somewhat confident	Confident	Extremely confident
Establish and maintain effective classroom management	❏❏	❏❏	❏❏	❏❏
Create a lesson plan	❏❏	❏❏	❏❏	❏❏
Develop strategies for working with parents and families	❏❏	❏❏	❏❏	❏❏
Recognize and respect individual family differences	❏❏	❏❏	❏❏	❏❏
Conduct parent/family-teacher conferences	❏❏	❏❏	❏❏	❏❏
Integrate multiple subject areas	❏❏	❏❏	❏❏	❏❏
Differentiate instruction for all students	❏❏	❏❏	❏❏	❏❏
Create a learning environment that encourages students to appreciate cultural diversity	❏❏	❏❏	❏❏	❏❏
Integrate technology in the delivery of instructional content	❏❏	❏❏	❏❏	❏❏
Use manipulatives across subject areas to teach concepts	❏❏	❏❏	❏❏	❏❏
Use a variety of instructional strategies to facilitate increased reading comprehension	❏❏	❏❏	❏❏	❏❏
Teach reading in my content area	❏❏	❏❏	❏❏	❏❏
Cultivate relationships with students	❏❏	❏❏	❏❏	❏❏
Maintain student engagement during instruction	❏❏	❏❏	❏❏	❏❏
Develop assessments that accurately reflect	❏❏	❏❏	❏❏	❏❏

student learning

	Not at all confident	Somewhat confident	Confident	Extremely confident
Use formative assessments to guide instruction	❏❏	❏❏	❏❏	❏❏
Use summative assessments to guide instruction	❏❏	❏❏	❏❏	❏❏
Facilitate small group instruction	❏❏	❏❏	❏❏	❏❏
Provide instruction aligned with the College and Career Readiness Standards (CCRS)	❏❏	❏❏	❏❏	❏❏
Provide instruction aligned with Texas Essential Knowledge and Skills (TEKS)	❏❏	❏❏	❏❏	❏❏
Provide instruction aligned with national teaching standards	❏❏	❏❏	❏❏	❏❏

15. **Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in your ability to do the following in mathematics:**

	Not at all confident	*Somewhat confident*	*Confident*	*Extremely confident*
Assess the different ways students solve particular problems	❏❏	❏❏	❏❏	❏❏
Use representations (e.g., geometric representation, graphs, number lines) to show why a procedure works	❏❏	❏❏	❏❏	❏❏
Explain how to arrive at a solution to a problem	❏❏	❏❏	❏❏	❏❏
Choose appropriate mathematics curriculum materials	❏❏	❏❏	❏❏	❏❏
Use technology (e.g., graphing calculators, Geometer's Sketchpad) for the purpose of teaching mathematics	❏❏	❏❏	❏❏	❏❏
Make mathematical connections to the real world	❏❏	❏❏	❏❏	❏❏

16. **Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in *preparing your students* to do the following in mathematics:**

	Not at all confident	*Somewhat confident*	*Confident*	*Extremely confident*
Develop a plan to solve a problem	❏❏	❏❏	❏❏	❏❏
Use logical reasoning to solve problems	❏❏	❏❏	❏❏	❏❏
Connect mathematics to real life	❏❏	❏❏	❏❏	❏❏
Connect mathematics to other content areas	❏❏	❏❏	❏❏	❏❏
Conduct research (i.e., collect, describe, and analyze data)	❏❏	❏❏	❏❏	❏❏
Communicate mathematical ideas	❏❏	❏❏	❏❏	❏❏
Use technology to solve mathematical problems (e.g., graphing calculators, Geometer's Sketchpad)	❏❏	❏❏	❏❏	❏❏

17. Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in your ability to do the following in science:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Manage a classroom of students engaged in laboratory activities	❏❏	❏❏	❏❏	❏❏
Consider students' prior conceptions about natural phenomena when planning instruction	❏❏	❏❏	❏❏	❏❏
Facilitate student-led inquiry activities	❏❏	❏❏	❏❏	❏❏
Conduct teacher-guided inquiry activities	❏❏	❏❏	❏❏	❏❏
Apply science concepts to real and authentic life scenarios	❏❏	❏❏	❏❏	❏❏
Teach students how to interpret graphs	❏❏	❏❏	❏❏	❏❏
Identify student misconceptions	❏❏	❏❏	❏❏	❏❏

18. Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in *preparing your students* to do the following in science:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Think scientifically about natural phenomena	❏❏	❏❏	❏❏	❏❏
Design safe scientific investigations	❏❏	❏❏	❏❏	❏❏
Use current technology to learn about scientific concepts	❏❏	❏❏	❏❏	❏❏
Communicate scientific information	❏❏	❏❏	❏❏	❏❏
Apply mathematical concepts in science	❏❏	❏❏	❏❏	❏❏
Comprehend scientific articles	❏❏	❏❏	❏❏	❏❏
Apply research skills in science	❏❏	❏❏	❏❏	❏❏
Recognize themes (e.g., states of matter, energy, change over time) across the scientific disciplines	❏❏	❏❏	❏❏	❏❏
Recognize the role of science in society	❏❏	❏❏	❏❏	❏❏
Analyze the structure of science content	❏❏	❏❏	❏❏	❏❏
Formulate explanations for scientific results	❏❏	❏❏	❏❏	❏❏
Interpret data	❏❏	❏❏	❏❏	❏❏

19. Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in your ability to do the following in reading/language arts:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Analyze literature	❏❏	❏❏	❏❏	❏❏
Build student motivation to read	❏❏	❏❏	❏❏	❏❏
Model the writing process (i.e., drafting,	❏❏	❏❏	❏❏	❏❏

editing, and revising)

	Not at all confident	Somewhat confident	Confident	Extremely confident
Teach students to apply various strategies to interpret a writer's purpose	❏❏	❏❏	❏❏	❏❏
Expose students to a wide range of literary genres	❏❏	❏❏	❏❏	❏❏
Teach grammar in context	❏❏	❏❏	❏❏	❏❏

20. Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in *preparing your students* to do the following in reading/language arts:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Write in a focused and coherent manner	❏❏	❏❏	❏❏	❏❏
Critically analyze a variety of literary genres	❏❏	❏❏	❏❏	❏❏
Analyze the influence of classic literature from a variety of cultures on later literature	❏❏	❏❏	❏❏	❏❏
Utilize the elements of communication	❏❏	❏❏	❏❏	❏❏
Deliver focused and coherent presentations	❏❏	❏❏	❏❏	❏❏
Apply listening skills in a variety of settings	❏❏	❏❏	❏❏	❏❏
Apply research skills in reading/language arts	❏❏	❏❏	❏❏	❏❏

21. Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in your ability to do the following in social studies:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Include time for students to present relevant, student-created products to the class	❏❏	❏❏	❏❏	❏❏
Discuss multiple perspectives when addressing social studies topics	❏❏	❏❏	❏❏	❏❏
Use technology (e.g., Google Earth, PowerPoint) within social studies lessons	❏❏	❏❏	❏❏	❏❏
Integrate current events in social studies lessons	❏❏	❏❏	❏❏	❏❏

22. Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in *preparing your students* to do the following in social studies:

	Not at all confident	Somewhat confident	Confident	Extremely confident
Develop logical contexts for recognizing themes in social studies	❏❏	❏❏	❏❏	❏❏
Comprehend current event articles (e.g., newspaper, magazine)	❏❏	❏❏	❏❏	❏❏
Provide examples of social studies within other content areas	❏❏	❏❏	❏❏	❏❏

184

Integrate real-life examples in social studies discussions	❑❑	❑❑	❑❑	❑❑
Recognize chronological relationships in social studies topics	❑❑	❑❑	❑❑	❑❑
Use technology to further the understanding of social studies concepts (e.g., Google Earth, PowerPoint)	❑❑	❑❑	❑❑	❑❑

23. Have you taken any online/hybrid courses as a part of your teacher preparation program? (Hybrid classes involve partial face-to-face instruction and partial online instruction.)

❑❑ *Yes*

❑❑ *No*

24. If "Yes", please indicate the extent to which you agree with the following statements regarding online/hybrid courses in your teacher preparation program:

	Strongly disagree	*Disagree*	*Agree*	*Strongly agree*
The classes were well organized.	❑❑	❑❑	❑❑	❑❑
The instructor provided prompt feedback.	❑❑	❑❑	❑❑	❑❑
I had the opportunity to interact with other students in the course through online discussions, group projects, etc.	❑❑	❑❑	❑❑	❑❑
The classes were challenging.	❑❑	❑❑	❑❑	❑❑
The classes were **NOT** repetitive of courses I had already taken.	❑❑	❑❑	❑❑	❑❑
Online discussions contributed to my knowledge about teaching.	❑❑	❑❑	❑❑	❑❑

25. Please reflect back to when you completed your teacher preparation program and indicate your level of confidence at that time in your ability to do the following with English as Second Language (ESL) students:

	Not at all confident	*Somewhat confident*	*Confident*	*Extremely confident*
Integrate social language instruction with academic language instruction	❑❑	❑❑	❑❑	❑❑
Plan instruction that recognizes different proficiency levels within the language domains of listening, speaking, reading, and writing	❑❑	❑❑	❑❑	❑❑
Plan activities that allow students to demonstrate their knowledge on a topic, regardless of their English proficiency levels	❑❑	❑❑	❑❑	❑❑
Use English language learners' primary language as an instructional tool	❑❑	❑❑	❑❑	❑❑

	Strongly disagree	Disagree	Agree	Strongly agree
Communicate with the families of English language learners	❏❏	❏❏	❏❏	❏❏
Set language objectives for English language learners, regardless of content area	❏❏	❏❏	❏❏	❏❏
Teach students whose primary language is not English	❏❏	❏❏	❏❏	❏❏

26. My teacher preparation program provided instruction about the following regarding teaching special populations:

	Strongly disagree	Disagree	Agree	Strongly agree
The process for referring students for special education services	❏❏	❏❏	❏❏	❏❏
The legal and ethical obligation of general education teachers to participate in the Individualized Education Plan (IEP) process	❏❏	❏❏	❏❏	❏❏
Student growth and development	❏❏	❏❏	❏❏	❏❏
Strategies to ensure that students with disabilities are integrated into the classroom	❏❏	❏❏	❏❏	❏❏
The use of resources for assessing and educating students with individual needs in the general education classroom	❏❏	❏❏	❏❏	❏❏

27. Please indicate the extent to which you agree with the following items regarding professionalism/professional growth:

	Strongly disagree	Disagree	Agree	Strongly agree
Program advisors/faculty in my teacher preparation program provide assistance in creating résumés.	❏❏	❏❏	❏❏	❏❏
Program advisors/faculty in my teacher preparation program helped prepare me for job interviews.	❏❏	❏❏	❏❏	❏❏
My teacher preparation program offered information regarding career opportunities.	❏❏	❏❏	❏❏	❏❏
My teacher preparation program prepared me to pass the content area exams in my certification area.	❏❏	❏❏	❏❏	❏❏
My teacher preparation program fostered collaboration among participants.	❏❏	❏❏	❏❏	❏❏
My teacher preparation program facilitated opportunities for students in the program to collaborate with teachers in the field	❏❏	❏❏	❏❏	❏❏
My teacher preparation program introduced me to professional organizations pertinent to my content area/field.	❏❏	❏❏	❏❏	❏❏
My teacher preparation program introduced me to research-based articles related to my field.	❏❏	❏❏	❏❏	❏❏

28. In thinking about your experience as a student teacher or an intern, please indicate the extent to which you agree with the following statements regarding mentor teachers/university supervisors:

	Strongly disagree	Disagree	Agree	Strongly agree
My campus mentor teacher/cooperating teacher helped me solve problems as they arose.	❏❏	❏❏	❏❏	❏❏
My campus mentor teacher/cooperating teacher assisted me in finding useful materials and resources.	❏❏	❏❏	❏❏	❏❏
My campus mentor teacher/cooperating teacher provided me with frequent, helpful feedback and ideas.	❏❏	❏❏	❏❏	❏❏
My campus mentor teacher/cooperating teacher was easily accessible.	❏❏	❏❏	❏❏	❏❏
My university supervisor visited my classroom on a regular basis.	❏❏	❏❏	❏❏	❏❏
My university supervisor assisted me with classroom management techniques.	❏❏	❏❏	❏❏	❏❏
My university supervisor helped me improve my teaching skills.	❏❏	❏❏	❏❏	❏❏

29. Please indicate the extent to which you agree with the following items regarding your university instructors:

	Strongly disagree	Disagree	Agree	Strongly agree
Overall, my instructors were knowledgeable about the latest trends in curriculum and instruction.	❏❏	❏❏	❏❏	❏❏
Overall, my instructors were knowledgeable about the realities of teaching in the current classroom climate.	❏❏	❏❏	❏❏	❏❏
Overall, my instructors were accessible.	❏❏	❏❏	❏❏	❏❏
Overall, my instructors seemed to care about me as an individual.	❏❏	❏❏	❏❏	❏❏
Overall, my instructors gave assignments that connected coursework with my field experiences.	❏❏	❏❏	❏❏	❏❏
Overall, my instructors used various forms of media (e.g., video conferencing tools, watching videos) to enhance understanding of instructional concepts.	❏❏	❏❏	❏❏	❏❏

30. Please indicate the extent to which you agree with the following items regarding your current school climate/environment:

	Strongly	Disagree	Agree	Strongly

	disagree			agree
Teachers in my school work together to improve student learning.	❑❑	❑❑	❑❑	❑❑
Teachers in my school trust each other.	❑❑	❑❑	❑❑	❑❑
Teachers in my school use time together to discuss teaching and learning.	❑❑	❑❑	❑❑	❑❑
Teachers in my school feel responsible to help each other do their best.	❑❑	❑❑	❑❑	❑❑
Teachers in my school work especially hard with lower-achieving students.	❑❑	❑❑	❑❑	❑❑
Teachers in my school are confident they will be able to motivate their students.	❑❑	❑❑	❑❑	❑❑
Teachers in my school try to help **ALL** students succeed.	❑❑	❑❑	❑❑	❑❑
Teachers in my school continue to consider the instructional needs of a child, even when it seems that child does not want to learn.	❑❑	❑❑	❑❑	❑❑

31. Please indicate the extent to which you agree with the following items regarding reflections/future aspirations:

	Strongly disagree	Disagree	Agree	Strongly agree
If I could start over, I would choose education as my program of study.	❑❑	❑❑	❑❑	❑❑
If I could start over, I would choose to participate in my teacher preparation program.	❑❑	❑❑	❑❑	❑❑
Immediately upon completing the requirements for certification, I obtained a full-time teaching position in my certification area.	❑❑	❑❑	❑❑	❑❑
Three years from now, I plan to still be a classroom teacher.	❑❑	❑❑	❑❑	❑❑
Ten years from now, I plan to still be a classroom teacher.	❑❑	❑❑	❑❑	❑❑
I have completed or plan to complete in the future an advanced degree in education (e.g., Master's degree or higher).	❑❑	❑❑	❑❑	❑❑
I would recommend my teacher preparation program to other potential teachers.	❑❑	❑❑	❑❑	❑❑

32. Which experiences provided you with the most relevant information needed for classroom teaching? Please provide specific examples.

188

33. **What suggestions would you make for changing or improving your teacher preparation program? Please provide specific examples.**

34. Please provide any additional information you would like to share regarding your teacher preparation program. Please elaborate.

_____

_____

_____

_____

_____

35. **If you would like to receive a $25 Amazon gift card for completing the survey, please provide your name and email address.**

*_Note._ This information will in no way be connected to your survey responses and will only be used for the purpose of distributing gift cards.

Name: _____

Email: _____