Navigating Reform in Mathematics Teacher Education: Teacher Educators' Responses to edTPA and Professional Organizations' Initiatives

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This dissertation, NAVIGATING REFORM IN MATHEMATICS TEACHER EDUCATION: TEACHER EDUCATORS’ RESPONSES TO EDTPA AND PROFESSIONAL ORGANIZATIONS’ INITIATIVES, by ALESIA MICKLE MOLDAVAN, was prepared under the direction of the candidate’s Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education and Human Development, Georgia State University.

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NAVIGATING REFORM IN MATHEMATICS TEACHER EDUCATION:  
TEACHER EDUCATORS’ RESPONSES TO EDTPA AND PROFESSIONAL ORGANIZATIONS’ INITIATIVES

by

ALESIA MICKLE MOLDAVAN

Under the Direction of Dr. David W. Stinson

ABSTRACT

Teacher education reform is a controversial and highly politicized issue, especially when addressing ways to improve teacher quality, performance, and accountability (Cochran-Smith, Piazza, & Power, 2013). With national efforts to adopt more rigorous standards and comprehensive assessments (e.g., National Commission on Excellence in Education, 1983; U.S. Department of Education, 2011), teacher performance assessments and other reform recommendations from professional organizations (e.g., Association of Mathematics Teacher Educators [AMTE], National Council of Teachers of Mathematics [NCTM]) have caught the attention of stakeholders and policymakers. This study reports on the various reform initiatives in mathematics teacher education and the first nationally available, educator-designed teacher performance assessment known as the edTPA® (SCALE, 2014a).
In September 2015, the state of Georgia mandated that all prospective teachers attempt the edTPA during their teacher preparation programs and successfully pass to receive their teacher certification (GaPSC Rule 505-2-.26 Certification and Licensure Assessments, 2016). The policy forced not only prospective teachers to respond to the assessment but also teacher educators. This study uses a qualitative case study framed within a sociopolitical perspective to critically examine how nine secondary mathematics teacher educators from various institutions (i.e., large public, medium public, small private, and Historically Black Colleges and Universities) in Georgia respond to the edTPA and professional organizations’ reform initiatives (e.g., AMTE, 2017; NCTM, 2000, 2014) when preparing their prospective secondary mathematics teachers for teacher certification. Additionally, the study explores how the participants develop their prospective teachers’ understandings of the social contexts of mathematics teaching and learning while navigating such reform efforts.

Data collection included multiple interviews with and artifact elicitation from each participant. Data analysis identified eight resonating themes that revealed the edTPA as a catalyst for: (a) motivating program modifications; (b) accommodating edTPA preparatory assignments; (c) altering awareness and discourse in teacher preparation; (d) perpetuating beneficial and detrimental teaching messages; (e) threatening academic freedom; (f) escalating stress and anxiety; (g) developing as a potential gatekeeper; and (h) dehumanizing and depersonalizing mathematics education. Additional insight into the participants’ efforts to address social contexts with respect to equity revealed strengths and areas for improvement. Implications for mathematics teacher education are discussed.

INDEX WORDS: Mathematics education, Teacher performance assessments, Teacher reform
DEDICATION

This dissertation is dedicated with love and appreciation to my parents, Linde and Michael Mickle, and my ever supportive husband, Matthew Moldavan. Your endless patience, kindness, and support gave me strength along my academic journey.
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CHAPTER 1
INTRODUCTION

Teacher education reform is a controversial and highly politicized issue, especially when addressing ways to improve teacher quality, performance, and accountability (Cochran-Smith & Fries, 2001; Cochran-Smith, Piazza, & Power, 2013). In response to national reports initiating the need for reform in education (e.g., National Commission on Excellence in Education [NCEE], 1983; U.S. Department of Education, 2011), policymakers, state departments of education, institutions of higher education, professional organizations, and other stakeholders began to shift their attention to the adoption of more rigorous standards and comprehensive assessments. As an alternative to traditional paper-and-pencil assessments, teaching portfolios were introduced to showcase prospective teachers’ teaching performance and assessment (Au, 2013). With the advancement of portfolio-type teacher performance assessments used as accountability tools by state legislation and institutions of higher education (e.g., California’s legislation SB 2042, Georgia Professional Standards Commission Rule 505-2-.26 Certification and Licensure Assessments, Western Oregon University’s Teacher Work Sample), teacher educators must determine how they prepare their prospective teachers for such assessments in an era of teacher education reform.

The various ways teacher performance assessments are used within teacher preparation programs and tied to teacher certification has left stakeholders fighting for power. Greenblatt

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1 I use “prospective teachers” and “teacher candidates” interchangeably to describe students enrolled in teacher preparation programs. I acknowledge that there may be other instances in which different descriptors (e.g., beginning teachers, preservice teachers, student teachers) are used, but such cases are to honor the descriptors selected by other researchers and the participants.
(2015) described this fight with “teacher performance assessments” as nothing more than “taking power away” (p. 103). Those who wish to turn a blind eye to the dispute prolong a solution from rising out of the turmoil. As Freire (1985) wrote, “washing one’s hands of the conflict between the powerful and the powerless means to side with the powerful, not to be neutral” (p. 122).

Thus, I introduce this study as a means of exploring the good, the bad, and the ugly of one state’s adoption of a teacher performance assessment through the lens of secondary mathematics teacher educators’ experiences.

In particular, this study reports on the first nationally available, educator-designed teacher performance assessment for P–12 prospective teachers known as the edTPA®. The edTPA was designed and developed by the Stanford Center for Assessment, Learning and Equity (SCALE) to provide an accountability tool to measure prospective teachers’ readiness to teach (SCALE, 2014a). To aid with edTPA’s continued development and implementation, SCALE partnered with the American Association of Colleges for Teacher Education (AACTE). Additionally, SCALE recruited the Evaluation Systems of Pearson to provide an infrastructure for submitting, scoring, and reporting results. With approximately 40 states using the edTPA and/or other similar teacher performance assessments in varying ways (SCALE, 2014a), such as program completion/graduation, teacher certification, and/or program approval/accreditation, there is much needed research in secondary mathematics teacher educators’ experiences and discourse pertaining to teacher performance assessments (e.g., edTPA) and the messages such assessments send regarding what is privileged and valued in preparing mathematics teachers for twenty-first century classrooms.

Existing literature on the edTPA highlights both those who advocated for the standardized assessment to professionalize teaching and teacher education (e.g., Darling-
Hammond & Hyler, 2013; Ledwell & Oyler, 2016; Peck, Singer-Gabella, Sloan, & Lin, 2014) and those who warned of its possible harm and depprofessionalization of the field (e.g., Cochran-Smith et al., 2013; Jordan & Hawley, 2016; Madeloni & Gorlewski, 2013). Some researchers have described teacher performance assessments as blueprints to reform teacher preparation programs in institutions of higher education (e.g., Ledwell & Oyler, 2016; Liu & Milman, 2013; Peck, Gallucci, & Sloan, 2010). While some good may come out of program realignment to address “good” teaching practices\(^2\) as identified in such assessments, several researchers have feared what programs privilege and the implications that result, such as narrowed and depersonalized teaching pedagogy (e.g., Dover & Schultz, 2016; Lachuk & Koellner, 2015; Lit & Lotan, 2013; Madeloni & Gorlewski, 2013), the redesign of methods courses and student teaching field experiences (e.g., An, 2016; Barron, 2015), and prospective teacher academic oppression and gatekeeping (e.g., Ratner & Kolman, 2016). Additionally, insight into the perspectives and experiences of teacher educators and prospective teachers engaging with teacher performance assessments have revealed mixed responses to the various ways they have been influenced and affected by the assessments (e.g., Chung, 2008; Guaglianone, Payne, Kinsey, & Chiero, 2009; Meuwissen, Choppin, Shang-Butler, & Cloonan, 2015; Ratner & Kolman, 2016). These examinations, in many ways, have sparked further questioning and critique.

\(^2\) The word “good” is placed in quotation marks to recognize that I continue to trouble the concept in regard to what is identified as a good teaching practice. I also contemplate who speaks on behalf of defining good teaching practices (and for whom) as well as how the implications influence the teaching profession.
In addition to teacher performance assessments, professional mathematics education organizations\(^3\) have contributed their own reform initiatives to the teaching and learning of mathematics. For example, the National Council of Teachers of Mathematics (NCTM) initiated standards-based school mathematics to identify significant mathematical concepts and skills, which continues to guide the teaching, learning, and assessment of K–12 mathematics. Recently, NCTM published *Principles to Actions: Ensuring Mathematical Success for All* (2014) to address the necessary actions required by teachers and stakeholders to ensure equitable access to high-quality mathematics instruction. One of NCTM’s guiding principles (i.e., access and equity) identified what an “excellent mathematics program” requires for all students to maximize their learning potential. On a similar front, the Association of Mathematics Teacher Educators (AMTE) published *Standards for Preparing Teachers of Mathematics* (2017) initiating standards aimed at improving mathematics teacher preparation programs, informing accreditation, influencing policies, and encouraging discourse on how to advance the preparation of future mathematics teachers.

As secondary mathematics teacher educators prepare the next generation of teachers, they must navigate\(^4\) the various reform initiatives proposed by teacher performance assessments (e.g., edTPA) and professional organizations (e.g., AMTE, NCTM). They must not only familiarize

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\(^3\) Although several professional organizations contribute to mathematics education (e.g., American Mathematical Society, Georgia Council of Teachers of Mathematics, Mathematical Association of America, National Council of Supervisors of Mathematics, School Science and Mathematics Association), I focus my research (unless otherwise identified) on two particular organizations, which include the National Council of Teachers of Mathematics (NCTM) and the Association of Mathematics Teacher Educators (AMTE).

\(^4\) I use the term navigate to examine the course of action secondary mathematics teacher educators take to understand and respond to reform efforts in mathematics teacher education. Although I contemplated using other terms (e.g., negotiate), I recognize that state mandates and accreditation policies require teacher preparation programs to meet specified expectations. Thus, secondary mathematics teacher educators must also adhere and abide (to a certain extent) to the established requirements. The ways secondary mathematics teacher educators engage, modify, and accommodate to various initiatives encompass the purpose of this research.
themselves with the various initiatives but also grapple with what these initiatives communicate both socially and politically about mathematics teaching and learning. Then, they must determine the ways they respond to the initiatives when preparing, instructing, and assessing prospective teachers in their methods courses. Next, I reveal why this study is of personal interest to me and how the examination of secondary mathematics teacher educators’ responses to various reform initiatives can provide insight into the focus and discourse used to prepare future teachers embarking on the journey in mathematics education.

**The Journey in Mathematics Education**

*People take different roads seeking fulfillment and happiness. Just because they’re not on your road doesn’t mean they’ve gotten lost.*

—Dalai Lama

Teaching is a specialized skill that must be nurtured, respected, and embraced by those passionate and determined to uphold the responsibilities that come with its undertaking. Teachers must be knowledgeable not only about the content but also proficient in pedagogy that captivates those with inquisitive minds and those awaiting sparks to ignite their interests. I became interested in teaching as a young child, where I spent numerous hours teaching arithmetic computations to whomever would listen. When my little sister became tired of answering questions and watching me solve problems, I turned to my Barbie dolls. While in school, I would emulate my teachers and use my creativity to design mathematics-related games and projects to practice newly learned content. Although the mathematics content did not always come easy for me, my dedication to its daily practice and my satisfaction of grasping new concepts stimulated my fascination to further engage with learning mathematics.

When I began tutoring at local Boys and Girls Clubs of America, I discovered my passion for assisting others as they developed the knowledge, confidence, and interest in their
mathematics studies. I made it my mission to make mathematics content interesting, relevant, and achievable. I also used my personality, energy, and enthusiasm to excite those I tutored. I hoped to break the cycle of those who disliked the content and believed they could not be successful. My desire to tutor mathematics quickly flourished into my dream career of being a mathematics teacher (and later mathematics teacher educator). With encouragement from my family and the perseverance to make my dream a reality, I enrolled at one of the top mathematics teacher preparation universities in the nation—the Department of Mathematics and Science Education at the University of Georgia (UGA).

The mathematics and mathematics education courses at UGA challenged me to continuously question and reflect on my evolving understanding of mathematics as a discipline and a teaching profession. As I wrote pages of mathematical proofs, designed lessons to visually represent the division of fractions, and modeled the moon’s elliptical orbit using Geometer’s Sketchpad, just to name a few, I envisioned how my experiences using mathematics could be used in my future classrooms. Interwoven throughout my methods courses were opportunities to engage with the mathematics content as well as conceptualize ways to differentiate and use multiple representations to guide the teaching and learning of mathematics. Some course assignments included working with national and state mathematics standards, writing lesson plans, developing project-based assessments, modeling mathematics with technology, and reflecting on teaching strategies. In addition, I implemented my assignments in both small and large-scale teaching settings. My methods courses coupled with my clinical field experiences represented several guiding pit stops on my journey in mathematics education.

Prior to the completion of my teacher preparation program, I was tasked with an exit teaching portfolio assignment that required me to compile materials I used to teach a unit during
my student teaching experience. More specifically, the exit teaching portfolio included a
document addressing the unit’s overview, four extensive lesson plans, and post lesson
reflections. Given my placement in a Math III (precalculus) classroom, I taught eleventh-graders
a unit on conic sections. For the unit’s overview, I addressed the unit’s main goals, a daily
topic’s outline, and a summary of the assessments. From the daily topic’s outline, I selected four
lessons to build the bulk of my portfolio. For each lesson, I had to submit a detailed lesson plan
that addressed the lesson’s objectives, materials, Georgia Performance Standards, classroom set-up,
and lesson procedures, including the lesson’s opener, time-stamped activities, structure of
discussion and questions, extension, assessments, and closure. Throughout the activities and
assessments, I addressed issues of equity and diversity with respect to differentiating to learners’
strengths and needs. All instructional materials, differentiated assessments, and examples of
student work with teacher feedback were also attached.

I made comments in the margins of each lesson plan to describe my rationale for specific
actions (e.g., grouping students, questions asked to highlight misconceptions, strategies used to
address learners’ strengths and needs) based on readings and information addressed in the
program’s methods courses. As a follow-up to the lesson, I also included detailed reflections of
the lesson’s implementation, including how the students responded to the lesson and what I
would do differently next time. The assignments made me justify and reflect on my teaching
abilities and readiness for the classroom.

After I compiled my exit teaching portfolio material in a binder, I submitted it to the
professor teaching the seminar that corresponded with the clinical field experience. Following
the submission, I met with the professor to discuss any questions and receive feedback on my
work. I found the feedback to be informative and comprehensive of my overall growth as a
prospective teacher given that the professor also served as my university supervisor. Not only did I learn from the exit teaching portfolio and the one-on-one conference feedback but also I used my teaching portfolio to acquire a mathematics teaching position right after graduation.

I realized that my journey in mathematics education was uniquely shaped by my university’s teacher preparation program, including the required tasks and expectations. However, my understanding of the different paths along the journey was evident after I learned of other colleagues’ experiences. While teaching, I interacted with colleagues who completed teacher preparation programs at institutions of higher education, like myself, and others who took alternative teacher certification routes to become second- and third-career teachers. My interest in the journey of preparing mathematics teachers as well as expanding my knowledge of teaching pedagogy led me to graduate school to seek additional degrees and opportunities to explore a career in mathematics teacher preparation. With engagement in the initial teacher preparation program at my graduate school, I further confirmed that my mathematics teaching journey was only one path of many in mathematics education. When mathematics teachers have varied journeys, the intersection of the unique journeys enables opportunities for colleagues to collaborate and learn from one another’s experiences. I began to wonder how mathematics education might change in response to reform efforts to standardize the journey.

**Understanding the edTPA Hurdle**

While a doctoral student at Georgia State University (GSU), I became involved with the edTPA in several different contexts. In the summer of 2015, just prior to the start of edTPA’s high-stakes initiative in the state of Georgia, I co-taught two introductory methods courses to prospective secondary mathematics teachers seeking a Master of Arts in Teaching Secondary Mathematics degree. I collaborated with a secondary mathematics teacher educator, who also
served as the program coordinator, to plan, instruct, and assess the prospective secondary mathematics teachers in both courses. The new cohort of prospective teachers began the program’s designed sequence of courses during the summer semester. Thus, I not only co-taught two of the prospective teachers’ first methods courses but also I introduced them to program expectations, including the edTPA.

Prior to the start of the program, the cohort of prospective teachers met with the initial teacher preparation coordinator to discuss the state-mandated policy that required all prospective teachers to submit the edTPA to satisfy program requirements for graduation. The policy also required prospective teachers to pass the edTPA to receive their teaching licenses. Although I was not in this meeting, the prospective teachers had several questions regarding the assessment that were later communicated to their program coordinator with whom I co-planned the summer courses. To address the questions and ensure prospective teachers felt comfortable with the Secondary Mathematics edTPA, my co-instructor and I strategically planned the methods courses syllabi and activities to review information pertaining to the assessment’s expectations, including the tasks, commentary prompts, and terminology (i.e., academic language).

Given that I was new to the Secondary Mathematics edTPA, I had to read through the handbook and supplemental materials, such as *Making Good Choices: A Support Guide for edTPA Candidates* (SCALE, 2016b), *Understanding Academic Language in edTPA: Supporting Learning and Language Development* (SCALE, 2016c), and *Understanding Rubric Level Progressions: Secondary Mathematics edTPA* (SCALE, 2016d). I learned about the edTPA alongside the prospective teachers. My co-instructor, who worked with the previous cohort during the assessment’s trial-run, looked for opportunities to align previously designed course activities with what the edTPA required. From my observations, the edTPA influenced the focus
of the curriculum given that it was continuously referred to and, for practice purposes, embedded into the course activities. For example, the format of a written lesson plan was reorganized to include information pertaining to academic language (i.e., discourse, language function, syntax, and vocabulary). Additionally, one of the course’s field component required the prospective teachers to video themselves teaching, practice cutting a clip, and reflect on the piece using timestamps to answer commentary prompts similar to those found in edTPA’s Task 2: Instruction.

Although I observed the edTPA dominate the discourse in the methods courses, my co-instructor and I still made intentional efforts to address other pertinent concepts (e.g., access, culturally relevant pedagogy, equity, social justice). With knowledge of professional organizations’ initiatives (i.e., AMTE and NCTM), we purposefully embedded social justice and equity issues in class readings, discussions, and reflections. Topics of concern addressed strategies for holding students to high expectations and for providing access to excellent and equitable mathematics programs that were responsive to students’ prior mathematical knowledge, personal interests, and intellectual abilities. My co-instructor and I shared beliefs that mathematics should be related to students and their lives and consider the social as well as political aspects of teaching and learning, which were ideas echoed throughout the methods courses. Besides our efforts to address the social contexts of mathematics teaching and learning while simultaneously preparing prospective teachers for the edTPA, I wondered if other teacher educators in other teacher preparation programs were doing the same and in what ways.

Following my co-teaching experience, I took a position at GSU as a university supervisor of middle-level mathematics, science, and language arts prospective teachers during the 2015–2016 academic school year. In addition to observing my assigned prospective teachers in their
clinical field experiences, I provided feedback on their assignments. These assignments mirrored edTPA’s expectations and required prospective teachers to complete a mock-edTPA Context for Learning, 3-to-5 days of consecutive lesson plans, and other various requirements addressed in edTPA’s tasks, including practice responses to the commentary prompts. The clinical field experience seminars strategically factored in time to review edTPA’s handbooks and the associated tasks’ commentary prompts and rubrics. Additional efforts were made to review academic language and sample edTPA submissions as well as provide technical support (e.g., appropriate file formats, video file trimming and compression, videotaping techniques).

I worked with my assigned prospective teachers to provide feedback and support throughout their edTPA preparation. I witnessed first-hand how prospective teachers, mentor teachers, teacher educators, and university supervisors responded to the edTPA. Despite shared frustration from all involved, the edTPA, as described by SCALE (2014a), brought awareness to “good” teaching. I reflected on my own initial teacher preparation program at UGA and felt that my exit portfolio assignment, with tasks similar to those of the edTPA, made me reflect on good teaching practices without the high-stakes stress. I began to wonder if the extra pressure of a teacher performance assessment was “beneficial” to preparing quality teachers and at what stake. Concerns of how the edTPA might impact initial teacher preparation from both the perspectives of teacher educators and prospective teachers further sparked my research interest.

I continued to work with prospective teachers as they prepared for the edTPA during the 2016–2017 academic year. My position as a graduate research assistant for the Dean’s Office required me to assist prospective teachers with the technical and logistical aspects of the edTPA. I led seminars and one-on-one tutoring to review edTPA handbooks and rubrics. Additionally, I attended edTPA liaison meetings and conferences. I even presented at the 2016 National edTPA
Implementation Conference on how to support prospective teachers for the Secondary Mathematics edTPA during urban student teaching experiences. The discussed experiences, among others, drew my attention to the need for research on teacher educators’ experiences navigating the edTPA along with other professional mathematics education organizations’ reform initiatives. More specifically, I turned my focus to the state of Georgia, one of the nation’s states requiring a passing score on the edTPA to receive a teaching license.

**Purpose of the Study**

In September 2015, the state of Georgia mandated that all prospective teachers attempt the edTPA during their teacher preparation programs and successfully pass to receive their teacher certification (GaPSC Rule 505-2-.26 Certification and Licensure Assessments, 2016). The policy required Georgia’s stakeholders and 63 participating institutions to implement the edTPA (AACTE, n.d.-b). Thus, the policy forced not only prospective teachers to respond to the assessment but also teacher educators. Gurl and colleagues (2016) reported that edTPA’s high-stakes ramifications in other states have pressured some teacher preparation programs to divert their attention away from their missions and alter their focus to what the assessment deems “good” teaching. Additionally, edTPA as a top-down, one-size-fits-all assessment is argued as potentially doing more harm than good, especially when viewed from the standpoint of those working with and taking the assessment (e.g., Au, 2013).

The purpose of this research is to contribute to the emergent research on edTPA and study other pertinent reform efforts in mathematics teacher education from the perspective of secondary mathematics teacher educators throughout the state of Georgia. In particular, I use a qualitative case study framed within a sociopolitical perspective to examine nine secondary mathematics teacher educators’ responses to the edTPA and professional mathematics education
organizations’ initiatives (e.g., AMTE, 2017; NCTM, 2000, 2014) when preparing prospective secondary mathematics teachers for teacher certification. I also examine how the secondary mathematics teacher educators develop prospective secondary mathematics teachers’ understandings of the social contexts of mathematics teaching and learning while navigating such reform efforts.

**Research Questions**

The following three research questions guide the study:

1. How do secondary mathematics teacher educators respond to the edTPA as a state-mandated initiative to reform teacher assessment and readiness for the classroom?

2. What are secondary mathematics teacher educators’ experiences using the Secondary Mathematics edTPA and professional mathematics education organizations’ initiatives to prepare, instruct, and assess prospective secondary mathematics teachers?

3. How do secondary mathematics teacher educators develop prospective secondary mathematics teachers’ understandings of the social contexts of mathematics teaching and learning while navigating reform in mathematics education?
CHAPTER 2

LITERATURE REVIEW

With teacher education in the political spotlight, stakeholders and policymakers continue to focus their attention on professionalizing teaching and teacher education in hopes to “fix” the broken system (Cochran-Smith & Fries, 2001; Cochran-Smith et al., 2013). Even the former Secretary of Education Arne Duncan echoed similar concerns in a 2009 speech depicting a need for “revolutionary change” in teacher preparation programs given that they were “doing a mediocre job of preparing teachers for the realities of the 21st century classroom” (Duncan, 2009, para. 3). Cochran-Smith and colleagues (2013) attributed the highly politicized debates surrounding teacher education to social institutions being sites of political disagreement with policy-making of teacher quality and preparation regarded as a political enterprise. They asserted that contemporary teacher reform initiatives were focused on raising expectations for teacher performance and administering accountability measures. Institutions of higher education, national and regional accreditors, and professional organizations are just a few contributors who address these reform initiatives by proposing, piloting, and implementing such policies. In the following literature review, I describe several recent efforts to address reform in teacher education with particular emphasis on teacher performance assessments, state initiatives, and the work of professional mathematics education organizations.

To better understand the rationale for jumping on the reform bandwagon, a look at history is imperative. Concerns for American schools plagued the nation during the 1980s. In 1983, President Ronald Reagan’s National Commission on Excellence in Education reported on the quality of American schools in public and private K–16 educational settings in A Nation at
Risk: The Imperative for Educational Reform (NCEE, 1983). When comparing American schools with other advanced nations, the report revealed “disturbing inadequacies” in the educational process that contributed to the decline in educational performance (Findings section, para. 1). To reverse the perception that American schools were failing, the Commission recommended strengthening content requirements, adopting higher expectations and measurable performance standards, improving the preparation of teachers, and holding elected officials and educators responsible to enforce the reform solutions. States enacted such recommendations by initiating mandates that closely monitored school performance reports and student achievement on state assessments.

Meanwhile, Darling-Hammond and the National Commission on Teaching and America’s Future (NCTAF) led efforts to professionalize teaching and teacher education (Cochran-Smith & Fries, 2001). Additional support from the National Council for the Accreditation of Teacher Education (NCATE), the American Association of Colleges for Teacher Education (AACTE), the Council for the Accreditation of Educator Preparation (CAEP), the Interstate New Teacher Assessment and Support Consortium (InTASC), and the National Board for Professional Teaching Standards (NBPTS) also contributed to the development of high standards in the initial preparation, licensing, and certification of teachers (Cochran-Smith & Fries, 2001). Where teacher preparation and licensure programs previously turned their attention to “protecting the public from incompetent teachers,” their renewed focus looked to “providing some assurance of the quality and effectiveness of the teachers licensed” (Schalock, 1998, p. 270). Thus, teacher education would be viewed as much more than preparing teachers to have the knowledge and skills to enter the profession. Prospective teachers would also need to communicate their effectiveness in regard to teaching philosophies, dispositions, and
accomplishments. Teacher performance assessments would serve as one solution to address the professional performance and accountability standards of the new generation of teachers.

**Teacher Performance Assessments**

Beginning in the 1980s, teacher preparation programs implemented teaching portfolios as a form of performance assessments (Gurl et al., 2016). Teaching portfolios were used as a tool to formatively facilitate growth, summatively assess readiness, meet certification requirements, and communicate teacher candidates’ abilities to employers (Zeichner & Wray, 2001). The teaching portfolio not only addressed the call for a “bar exam” for teachers (Lipsky, 1988) but also it provided more trustworthy evidence of teacher readiness in comparison to a “paper-and-pencil test” (Au, 2013). Teacher candidates could demonstrate their conceptual understanding through performance while also reflecting on their own practice and the complexities of teaching (Wolf, 1996). With efforts to move beyond isolated assessments to more authentic measures of teacher quality and readiness (Darling-Hammond, 2000), state legislation and institutions of higher education adopted various portfolio-type teacher performance assessments (e.g., Teacher Work Sample, California Teaching Performance Assessment, Performance Assessment for California Teachers, Fresno Assessment of Student Teachers, edTPA) to gauge teacher preparation.

**Teacher Work Sample**

During the late 1980s, Western Oregon University developed a Teacher Work Sample (TWS) to meet the demands of accrediting agencies, standards, and state legislation (Haraway & Pease, 2014; Schalock, 1998). Around the same time, the state of Oregon passed the Oregon Educational Act for the 21st Century, which initiated school improvement and restructured Oregon’s schools to meet high academic standards for all students (Laguardia & Nave, 1994; Pratt, 2007). The TWS originally served as a capstone portfolio for teacher candidates during
their preparation programs to demonstrate their effectiveness to foster student learning in Oregon’s standards-based model of schooling (Schalock, 1998; Schalock & Myton, 2002). The TWS prompts required teacher candidates to address unit goals and objectives tied to state standards, describe students in the classroom and the community, design lesson plans, generate assessments, provide analyses of student learning, and reflect on teaching practices (Schalock & Myton, 2002). As the TWS quickly gained the attention of teacher preparation programs throughout the United States, several states adopted their own versions of the TWS (e.g., the Louisiana Components of Effective Teaching, the Iowa Teacher Quality Project, the Ohio Resident Educator Summative Assessment) to evaluate teacher effectiveness and readiness for the classroom.

**Teacher Performance Assessments in California**

Similarly, the state of California approved legislation SB 2042 (1998) that required teacher preparation programs to adopt teacher performance assessments to assess teacher candidates’ readiness to enter K–12 classrooms with proficient teaching skills. The state’s Commission on Teacher Credentialing proposed a teacher performance assessment model known as the California Teaching Performance Assessment (CalTPA). The Commission would use the teacher performance assessment as a credential measure to ensure teacher candidates demonstrated the ability to assist student success meeting and exceeding state content and performance standards. Teacher preparation programs could develop an alternative teacher performance assessment model as long as it was approved by the Commission (California Teaching Performance Assessment, n.d.).

The CalTPA became high-stakes in 2008 and required teacher candidates to complete a series of four performance tasks known as the Subject-Specific Pedagogy, the Designing
Instruction, the Assessing Learning, and the Culminating Teaching Experience tasks. All but one of the tasks required teacher candidates to work with K–12 students. Teacher preparation programs embedded the tasks in their course sequences and self-scored the assessment.

Meanwhile, Stanford University and California State University developed a state-approved Performance Assessment for California Teachers (PACT) and Fresno Assessment of Student Teachers (FAST), respectively. The PACT consisted of Embedded Signature Assessments throughout the teacher preparation program and a subject-specific Teaching Event during prospective teachers’ student teaching field experiences that addressed four tasks: planning, instruction, assessment, and reflection (PIAR) with a focus on academic language across the tasks (Pecheone & Chung Wei, 2007; SCALE, 2014b). For scoring purposes, the four tasks and the academic language component were comprised of specific rubrics that were scored on a scale of one to four (i.e., five rubrics for planning, two rubrics for instruction, three rubrics for assessment, two rubrics for reflection, and one rubric for academic language; Pecheone & Chung Wei, 2007). Similarly, the FAST addressed four tasks, which included the Comprehensive Lesson Plan Project, the Site Visitation Project, the Holistic Proficiency Project, and the Teaching Sample Project (Torgerson, Macy, Beare, & Tanner, 2009). Both models required teacher candidates to consider students with special needs, including English language learners, and reflect on professional practice. Following the assessments, teacher candidates received feedback on their teaching performance from trained evaluators within the university who scored the assessment.

**A National Teacher Performance Assessment**

After California began to implement various teacher performance assessments, the Stanford Center for Assessment, Learning and Equity (SCALE) partnered with the American
Association of Colleges for Teacher Education (AACTE) and the Evaluation Systems of Pearson to develop the first nationally available, educator-designed teacher performance assessment known as the edTPA (SCALE, 2014a). The creators drew from the National Board for Professional Teaching Standards, the InTASC Standards portfolio, and the PACT to design the edTPA. With help from the Teacher Performance Assessment Consortium to guide the effort, more than 1,000 teacher educators from 29 states and the District of Columbia and approximately 450 institutions designed, piloted, refined, and field-tested the edTPA over 6 years (AACTE, n.d.-a). In 2013, the edTPA was declared operational and ready for use across the United States (AACTE, n.d.-a).

Roughly 775 teacher preparation programs in 40 states and the District of Columbia currently use the edTPA and/or other similar teacher performance assessments in varying degrees, such as program completion/graduation, teacher certification, and/or program approval/accreditation (AACTE, n.d.-b). SCALE (2014a) described edTPA’s purpose as an educational opportunity for teacher candidates to demonstrate and receive feedback on their teaching performance and assessment, which aids in improving teacher candidates’ readiness for the classroom and reforming the teaching profession. AACTE endorsed edTPA for its authentic teaching materials that gave teacher preparation programs “access to a multiple-measure assessment system aligned to state and national standards—including Common Core State Standards and the Interstate Teacher Assessment and Support Consortium (InTASC)—that [would] guide the development of curriculum and practice around the common goal of making sure new teachers [were] able to teach each student effectively and improve student achievement” (AACTE, n.d.-a, para. 2).
The structural design of the edTPA is said to incorporate 80% general pedagogical constructs (i.e., integrating concepts of planning, instruction, and assessment) and 20% subject-specific pedagogy that aligns with content and pedagogical standards from national organizations, such as NCTM (Pecheone, Whittaker, & Klesch, 2016; Tanguay, 2018). The edTPA differs from other performance assessments in that it requires teacher candidates to compile artifacts (e.g., lesson plans, samples of student work, video segments) that reveal teacher candidates’ abilities to plan, instruct, and assess 3-to-5 days of consecutive learning segments (SCALE, 2014a). Additionally, teacher candidates answer commentary prompts that encourage them to justify their instructional and assessment decisions, analyze their teaching effectiveness with reference to specific evidence, reflect on their use of academic language, and assess data to inform student learning and future instruction (SCALE, 2016b; Tanguay, 2018).

Once teacher candidates submit the edTPA, trained edTPA evaluators then score the assessment using specified rubrics. The edTPA evaluators are comprised of teacher educators and P–12 teachers with subject-area and grade-level expertise that demonstrate consistent scoring on multiple portfolios (Tanguay, 2018). Teacher candidates receive their score in the form of a number, which indirectly ranks the candidate, his or her teacher educators, and the institution of higher education. Thus, teacher candidates’ futures are at the hands of trained, yet distant, strangers. Nevertheless, advocates for the edTPA highlight its “common set of expectations for licensure” (SCALE, 2014a, para. 7), where teacher candidates who score well on the edTPA are projected to be equitable and effective teachers in their content (Darling-Hammond & Hyler, 2013). Within my research, I describe the edTPA through the focus of the Secondary Mathematics Handbook.
The *edTPA Secondary Mathematics Assessment Handbook* (SCALE, 2016a) is one of 27 handbooks linked to individual content areas for teacher licensure. Despite SCALE having authorship and copyright to the handbook, the edTPA handbook notes that over 600 teachers and teacher educators from various organizations (e.g., NCTM), contributed to its production. Furthermore, the handbook states that it is “consistent with the [NCTM’s] *Principles and Standards for School Mathematics*” and addresses areas of conceptual understanding, procedural fluency, mathematical reasoning and problem-solving skills, and precise communication skills (SCALE, 2016a, p. 1). The handbook consists of three tasks (i.e., Task 1: Planning, Task 2: Instruction, and Task 3: Assessment) and sections on professional responsibilities, secondary mathematics context for learning information, secondary mathematics evidence charts, and a secondary mathematics glossary. Each task corresponds with 5 rubrics for a total of 15 rubrics, where a score of 0 to 5 can be made on each rubric.

The developers of the edTPA recommend a passing score of 42 out of 75 for the 15-rubric edTPA (AACTE, 2017); however, the state of adoption has the discretion to set different passing scores. Table 1 shows a list of states⁵ as of November 2017 with passing scores for the 15-rubric edTPA (SCALE, 2017). Of particular interest is the state of Georgia with a passing score of 38 out of 75. This score is calculated as “-1/2 Standard Error of Measurement (SEM)

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⁵ The noted states are at various stages of implementing the edTPA as statewide-performance assessment requirements for initial teacher certification. Some states (e.g., Alabama, Connecticut, Hawaii, New Jersey, North Carolina, Oregon, West Virginia) are still in the early stages of piloting the edTPA and establishing future passing scores. Other states with established passing scores (e.g., Georgia, Illinois, Tennessee) may (or have plans to) increase future passing scores. New York plans to lower the score to a 38 in years 2018 and 2019, increase the score to a 39 in years 2020 and 2021, and then increase the score again to 40 in years 2022 and beyond. Washington plans to incorporate student-voice rubrics, which will increase the score to 43. Table 1 is meant to reveal current states with policies in place (and in the works) as well as the variability found in passing scores of a “national” assessment.
below the national edTPA recommendation” (SCALE, 2018a). Next, I discuss how the state of Georgia adopted the edTPA.

<table>
<thead>
<tr>
<th>State</th>
<th>Passing Score</th>
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<tbody>
<tr>
<td>Alabama</td>
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<td>Arkansas</td>
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<td>California</td>
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<td>Delaware</td>
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<td>Georgia</td>
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<td>Illinois</td>
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<td>West Virginia</td>
<td>TBD</td>
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<tr>
<td>Wisconsin</td>
<td>38</td>
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</table>

Note. Data reflects states’ scores as of November 2017.

Teacher Certification Requirements in Georgia

In September 2015, the state of Georgia mandated that all prospective teachers enrolled in initial teacher preparation programs in Georgia pass the edTPA to receive teacher certification (GaPSC Rule 505-2-.26 Certification and Licensure Assessments, 2016). Prior to the state’s adoption of the edTPA, teacher preparation programs recommended certification upon completing program degree requirements (Teaching Certification, 2016). Additionally, prospective teachers were required to fulfill certain academic, assessment, and ethical standards of conduct as defined by the Georgia Professional Standards Commission (GaPSC).
In the education category, prospective teachers were required to complete a state-approved (or out-of-state-approved) teacher certification program in the field of their certification. Regardless of the path leading to their teacher certification programs, prospective teachers had to have a minimum of a bachelor’s degree. The state of Georgia also mandated special requirements in the subcategory of teacher preparation coursework and field experience. Prospective teachers seeking certification had to complete special education coursework and meet the recency-of-study rule. This rule required prospective teachers to obtain at least 6 semesters or 10-quarter hours of college credit within 5 years of applying for their certificate. For the field experience component, prospective teachers would be assigned to student teaching in a grade and content area that corresponded with their area of certification. Prospective teachers could have also taught out of the state for at least 1 year within 5 years of applying for their certificate or hold a National Board for Professional Teaching Standards certificate.

In the examination category, prospective teachers had to meet specific testing requirements set by the state. Regardless of the certification’s grade level and content area, all prospective teachers had to take and meet a minimum score on the Georgia Assessments for the Certification of Educators (GACE) Basic Skills Tests in Reading, Writing, and Mathematics. Prospective teachers could be exempt from the GACE Basic Skills Test if they met a minimum score on other assessments such as the SAT, ACT, or GRE. In addition, prospective teachers had to pass corresponding GACE Content Assessments in the area they wished to be certified.

In April 2014, the GaPSC adopted new Certification Rules developed by a task force, which included the GaPSC, the Georgia Department of Education (GaDOE), the Board of Regents, the Georgia Association of Educators (GAE), the Professional Association of Georgia Educators (PAGE), the Governor’s office, local units of administration (LUAs), and educator
preparation providers (Georgia Professional Standards Commission, 2014). Several major revisions and additions were made in the new Certification Rules such as the creation of a four-tiered certification structure, the elimination of the recency-of-study requirement, the introduction of GACE Content Assessments’ passing levels, and the addition of a new certification assessment called the edTPA.

All prospective teachers who completed student teaching and applied for induction on September 1, 2015 or later would now be required to receive a passing score on the edTPA during their teacher preparation program (Georgia Professional Standards Commission, 2014). For out-of-state applicants with less than one year of teaching experience, prospective teachers would have to pass a portfolio-based content pedagogy assessment (e.g., edTPA) during their teacher preparation program or pass the Praxis Performance Assessment for Teachers. Prospective teachers enrolled in non-traditional programs would also be required to pass the edTPA.

The GaPSC with input from the edTPA advisory and standard setting committees adopted an initial passing score of 35 on the 15-rubric edTPA for the first 2 years of implementation (academic years 2015–2016 and 2016–2017; Johnston, 2015). In the academic year 2017–2018, the state raised the passing score to 38 on the 15-rubric edTPA (SCALE, 2018). For how long the passing score of 38 remains is yet to be determined. However, it is projected that the 15-rubric edTPA will rise yet another 3 points within the next 2 academic years. Teacher preparation programs, faculty members, and teacher candidates will have to adjust to the ever-increasing pressure of the high-stakes assessment. Recent literature describing the response with respect to perspectives, experiences, concerns, and program changes can
provide insight into the influence teacher performance assessments have during an era of teacher education reform.

**Researching Teacher Performance Assessments**

Over the last few decades, teacher preparation programs throughout the United States adopted teacher performance assessments to assess teacher candidates’ readiness to enter P–12 classrooms with proficient teaching pedagogy. These performance assessments, such as the California Teaching Performance Assessment (CalTPA), the Performance Assessment for California Teachers (PACT), the Teacher Work Sample (TWS), and the Fresno Assessment of Student Teachers (FAST), served as capstone portfolios for prospective teachers seeking graduation from teacher preparation programs. As previously discussed, states are now tying teaching certification to passing a teacher performance assessment known as the edTPA. This section presents a review of empirical research on how teacher performance assessments have impacted teacher preparation program curricula, faculty members, and teacher candidates. I disclose the observed benefits and learning gains of teacher performance assessments as well as the shared challenges and concerns. Additional research on the possible gatekeeping response to teacher performance assessments is also addressed. I hope to bring awareness to current and future research needed in the field of teacher preparation and education.

**Teacher Preparation Program Curricula**

Some researchers have described teacher performance assessments as blueprints to reform teacher preparation programs in institutions of higher education (e.g., Ledwell & Oyler, 2016; Liu & Milman, 2013; Peck et al., 2010). While some good may come out of program

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6 I find it important to note that the following research on teacher performance assessments includes studies on various assessments (i.e., CalTPA, edTPA, FAST, and PACT).
realignment to address “good” teaching practices as identified in such assessments, several researchers have expressed concerns about what programs privilege as a result, such as the narrowing and depersonalization of pedagogy (e.g., Dover & Schultz, 2016; Lachuk & Koellner, 2015; Lit & Lotan, 2013; Madeloni & Gorlewski, 2013) and the redesign of curriculum (e.g., An, 2016; Barron, 2015). In the following section, I review how teacher preparation programs have responded to embedding (or not) teacher performance assessments in their programs. In particular, I report on program changes, faculty member collaboration, and the design and evaluation of program curricula.

Ledwell and Oyler (2016) utilized practitioner research to interview 19 teacher educators and program coordinators from 12 programs at New York’s Teachers College, Columbia University to evaluate program changes in response to the edTPA. Three levels of program change were identified. In the first level, edTPA work remained external to the program’s curriculum. Programs falling in this level disliked the idea of teacher candidates feeling as if they paid for test preparation and consequently kept edTPA support to a minimum. In level two, programs acknowledged revisions made to their curriculum. Specific topics addressed in the edTPA were strictly reinforced. In the third level, programs replaced valued content with edTPA content to focus curriculum on edTPA’s cycle of planning, instruction, and assessment. Thus, this study showed the varying ways programs responded to curriculum changes when accommodating for the edTPA.

Although some teacher preparation programs were hesitant to adopt changes in light of new state policy pressures, some who did responded through collaboration. Peck and colleagues’ (2010) case study on 35 teacher educators discussed the change in one program’s goals as a reflection of teacher educator collaboration. After reviewing teacher candidate work samples on
a teacher performance assessment, teacher educators met to discuss their concerns. Through collective efforts from the program’s teacher educators, the program increased the engagement of the faculty members in joint activities, increased the program’s alignment of concepts and practices, and reimaged the program’s identity. Thus, the adoption of a teacher performance assessment impacted program changes in curriculum and faculty member collaboration.

Darling-Hammond and Snyder (2000) suggested teacher preparation programs integrate teacher performance assessments into curriculum and instruction instead of treating the assessments as program add-ons. Heeding this advice, some institutions of higher education embedded elements of teacher performance assessments (e.g., edTPA) into their methods courses. Barron (2015) conducted a study at Austin Peay State University in Tennessee that first implemented the edTPA in 2011. From the start of the teacher preparation program, “pre-service candidates were given opportunities during their earliest field experiences to practice planning, teaching, assessing, and reflecting, as they would in the edTPA” (p. 70). During the first foundation course, teacher candidates learned about the edTPA’s Context for Learning form. In their instructional strategies course, teacher candidates practiced academic language and lesson planning that was inclusive of all students’ needs. Teacher candidates also learned how to record, cut, and upload videos of instruction and student engagement during their technology course.

In addition to embedding aspects of the edTPA into their methods courses, Barron (2015) reported on the university’s year-long student teaching placement. Extending residency beyond one semester allowed teacher candidates to better acquaint themselves with their students and mentor teacher while preparing for the edTPA. The program also planned seminars during the student teaching experience that focused on identifying students’ individual strengths and needs, evaluating assessments, providing student feedback, and engaging in reflection, all of which
were key factors addressed in the edTPA. Overall, the program provided opportunities for teacher candidates to practice the edTPA as part of the curriculum.

Okremtchouk and colleagues (2009) reported mixed feelings from teacher candidates when teacher preparation programs at a campus of the University of California embedded aspects of the PACT into their coursework. Several teacher candidates stated that the PACT was not helpful and negatively impacted their university coursework. They identified stress and time constraints as contributors influencing their views. However, some teacher candidates did find the PACT to be helpful in that it encouraged them to focus on instructional strategies and engage in reflection. Additionally, teacher candidates noted that PACT-related coursework provided them with opportunities to learn about the PACT requirements prior to their student teaching semester. A suggestion was made that “program administrators, professors, and teacher educators [could] help their students by scaffolding the PACT process into their coursework and by providing formative feedback throughout the process” (p. 58). Thus, teacher preparation programs should consider when and how they introduce and prepare teacher candidates for teacher performance assessments.

Performance assessments can provide teacher preparation programs with insight into teacher candidates’ performance on various aspects of teaching (Barron, 2015). Knowing how well teacher candidates score on planning, instruction, assessment, and reflection can guide program curricula changes (Darling-Hammond, 2010). In a study by Peck and McDonald (2013), three California universities were examined for how they used PACT data for program improvement. Programs worked with faculty members to develop policies and protocols for analyzing the PACT data. Some programs used the PACT data to identify issues with teacher candidates’ learning outcomes. In response, faculty members were charged with tasks to
“develop more comprehensive and collaborative approaches across the program” to fill “the holes in the data” (p. 17). Additionally, samples of teacher candidate work were “particularly powerful in motivating faculty engagement and action” (p. 18). Not all programs used the data the same way, but the PACT data aided in making decisions about program structure, curriculum, and practice.

When teacher preparation programs determine the ways in which to embed teacher performance assessments within their programs’ curricula, time restraints leave some content privileged over others. Gurl and colleagues (2016) reported that teacher preparation programs in New York had to revise course and fieldwork requirements for a secondary mathematics program with the introduction of the edTPA requirement. In their methods course, modifications were made to the teaching of how to write a lesson plan. To address the expectations of the edTPA, technical aspects such as objectives, development, and summary were added to the lesson plan. Additionally, the student work analysis added components such as tabulating correct and incorrect answers, identifying common mistakes and misconceptions, and planning for the next steps. Readings about language function and the edTPA rubrics were also added to the methods course. Overall, the methods course made time to address information pertaining to the edTPA, which “[sacrificed] class time previously used for mathematical and pedagogical learning opportunities” (p. 57).

Similarly, Liu and Milman (2013) conducted a case study on one secondary education teacher preparation program during the first year of PACT’s mandated implementation to examine how teacher performance assessments impacted program changes toward the infusion of multicultural education. Findings indicated that the PACT’s teaching event supported teacher candidates’ work with multicultural education by teaching academic language, helping all
students access curriculum, and identifying students’ socioeconomic and cultural contexts. Although teacher candidates shared that the PACT “supported transfer of theory to practice in becoming more intentionally reflective teachers,” critical reflection was not the primary objective of the PACT’s documents (p. 132). Liu and Milman recommended that “educators must [capitalize] on ways such assessments prepare teacher candidates for diverse classrooms, while also ‘filling in the gaps’ where TPAs or other standardized assessments may not address multicultural education objectives sufficiently” (p. 138).

**Faculty Members**

The perceptions and experiences of faculty members engaging with teacher performance assessments can offer additional insight to better understand the influence of such assessments on teacher preparation. The following literature explores faculty members’ responses, including the benefits, challenges, and concerns of accommodating for teacher performance assessments. In particular, I report on faculty members’ perceptions of the assessments and the ways in which faculty members navigate the assessments’ demands, modify their academic discourse, and adopt different levels of support for teacher candidates.

Not all faculty members see value in teacher performance assessments. An (2016) conducted a case study on the impact of edTPA on an elementary social studies teacher preparation program in Georgia. The results of both an online survey completed by 32 faculty members and 6 phone interviews revealed varied, often conflicting, views toward the edTPA. Many of the faculty members opposed the edTPA “due to their experience of decreased teacher educators’ academic freedom, distraction from critical multicultural education, and/or narrowing the possibilities of teaching and learning” (p. 32). Those in support commented on the edTPA’s
use of “student learning in assessment, reflection, culturally relevant pedagogy, or program improvement via cross-program dialog about curriculum alignment and collaboration” (p. 32).

Similarly, Guaglianone and colleagues (2009) gathered survey responses from 19 California State University (CSU) administrators to learn of their perceptions toward teacher performance assessments (i.e., the CalTPA, the FAST, and the PACT) and the ways they planned and implemented the assessments at each campus. The reports identified faculty members’ perceived benefits and concerns with funding, training, collaboration, scoring, technology support, and lessons learned. From a beneficial perspective, faculty members commented on the increased communication and collaboration within and across campuses. As a result, program improvements were made that focused on designing a strong outcome-based program. In turn, survey responses revealed that both teacher candidates and faculty members benefited from the changes in the program curricula.

Conversely, Guaglianone and colleagues’ (2009) survey results also addressed the challenges in the implementation of teacher performance assessments across CSU’s campuses. All campuses shared concerns for staffing teacher performance assessment coordinators, providing adequate training to assessors, and arranging technology support for both faculty members and teacher candidates. However, the overarching challenge dealt with funding issues. On average, depending on the size of the campus, the implementation of the assessments cost each campus roughly $200,000 annually. The funds considered training, technology purchases, staff wages, and other various needs. This study asserted that the demand on faculty members negotiating teacher performance assessments could be beneficial yet challenging.

Faculty members who work with teacher performance assessments also observe a shift in their academic discourse. In a self-study, Kornfeld, Grady, Marker, and Ruddell (2007)
examined how 10 full-time faculty members at a California State University adopted a “common language” that aligned with the California Commission for Teacher Credentialing (CCTC) standards of a state-mandated teacher performance assessment. The faculty members reported increased use of “technocratic” discourse that reflected a shift in the way they spoke with other faculty members and teacher candidates. The faculty members also expressed how the teacher performance assessments impacted their conceptualization of teacher education aligning with standards, which narrowed their thinking about instruction.

On a similar note, faculty members’ views toward teacher performance assessments can also influence the type and amount of support they provide to teacher candidates. Ratner and Kolman (2016) conducted an exploratory case study of nine faculty members’ stances toward the edTPA in New York. The study determined that the faculty members’ stances influenced the level of support delivered to teacher candidates during the edTPA process. Despite a document listing the guidelines for acceptable candidate support, the faculty members interpreted support differently in response to ethical, pedagogical, and logistical dilemmas.

Ratner and Kolman (2016) grouped faculty members into categories of “breakers,” “benders,” and “obeyers.” The breakers were concerned with edTPA’s hasty implementation, financial demands, and resistance to offering teacher candidates support when teachable learning moments occurred. The benders were apprehensive of edTPA’s battle with social justice issues. If faculty members believed that their teacher preparation program failed to communicate or facilitate assessment requirements given condensed timelines, challenges with school placements, or monetary issues, the faculty members adjusted their support to teacher candidates as per the need. For the obeyers, faculty members acknowledged edTPA’s challenge but capitalized on its opportunity to force re-examination of teaching practices and build teacher
The continuum of support suggests that faculty members’ views of teacher performance assessments can impact, for better and for worse, teacher candidates’ support.

**Teacher Candidates**

To adequately acknowledge the impact of teacher performance assessments on all involved, it is also necessary to understand teacher candidates’ perspectives and experiences. Some researchers have argued that teacher performance assessments “provide candidates an important opportunity to integrate and extend their knowledge about teaching, deepen their understanding of the needs of individual students, and improve their practice” (Peck et al., 2014, p. 14). However, not all teacher candidates have agreed with the previous statement. In the following section, I discuss a few studies with detailed insight into teacher candidates’ affordances, challenges, and concerns when tasked with teacher performance assessments.

Meuwissen and colleagues (2015) conducted survey research on 104 teacher candidates from 10 institutions to better understand their perspectives and experiences completing the edTPA in the states of Washington and New York. The survey report addressed four main issues: (a) teacher candidates’ understanding of the edTPA’s purpose, context, and content; (b) teacher candidates’ perceptions of the edTPA as it existed in their teacher preparation programs; (c) teacher candidates’ views of the edTPA as a reflection of fairness, credibility, and the completion process; and (d) teacher candidates’ experiences preparing and submitting their edTPA portfolios to their state education departments. The survey administered to the participants was composed of Likert-type items and open-ended questions.

Meuwissen and colleagues’ (2015) findings from the survey revealed that across both states more than half of the respondents indicated they understood the specific criteria of the edTPA’s rubrics by which they would be judged, but roughly 80% of the respondents found the
edTPA’s goals to be unclear and only 30% were adequately supported in selecting artifacts for the assessment. These results brought awareness to the assessment’s quick implementation, ill-prepared explanation of its expectation and purpose, and insufficient support. As for the study’s remaining findings, 85% of the teacher candidates perceived the edTPA to be an unfair assessment of their teaching practices, 90% indicated that the edTPA was a time-consuming process, and 50% noted that the edTPA’s conceptions were consistent with their own as well as their teacher preparation programs’ conceptions of good teaching. When comparing the responses of edTPA completers in New York and Washington, New York completers revealed less of an understanding of the assessments’ goals and criteria, less awareness of the edTPA requirement mandated by the teacher preparation program, less preparedness to write commentaries, and less awareness of where to find resources to support their completion of the edTPA. Such results communicate the disadvantages to a state’s quick implementation of the edTPA and its effect on teacher candidates’ perspectives and experiences.

Greenblatt (2016) conducted a mixed-methods study of teacher candidates’ and teacher educators’ experiences with a high-stakes elementary education edTPA portfolio in New York City. In addition to receiving survey responses from 61 teacher candidates, Greenblatt interviewed 14 teacher candidates from 6 colleges as well as 8 teacher educators from 7 colleges to corroborate the teacher candidates’ experiences. Findings revealed information pertaining to the teacher candidates’ perceptions of their supports and challenges; the effects of the edTPA on teacher candidates’ personal, academic, and professional experiences; and the impact of a state-mandated performance assessment on teacher educators and the teacher education curriculum. Greenblatt described how teacher candidates purposefully selected classes with fewer special needs and English language learners to avoid being responsible for them in their portfolios.
Some teacher candidates exchanged field experience time to work on their edTPA. Furthermore, teacher candidates experienced financial challenges and the need for emotional and psychological support. Findings also disclosed teacher educators’ concerns with the edTPA impacting academic freedom, institutional financial costs, and the adoption of edTPA discourse in teaching pedagogy.

Although several negative consequences from edTPA’s implementation surfaced, Greenblatt (2016) also described some positive consequences that resulted (i.e., increased awareness of good teaching practices, confidence, and teacher candidate reflection). She recommended policy initiatives to include revamping a safety-net for those who did not pass the exam, increasing support funding for faculty and teacher preparation programs, providing teacher candidates with emotional and psychological support to combat the additional stress of the high-stakes assessment, allowing teacher candidates to contest a score if inconsistent with degree work, and making changes to the scoring process.

Lin (2015) conducted a mixed-methods case study of seven teacher candidates to examine how the edTPA functioned as a learning opportunity in one elementary teacher preparation program in the state of Washington. Lin’s study aimed to clarify teacher candidates’ learning outcomes related to the edTPA and identify possible opportunities and constraints to learning as well as the contextual situations under which learning occurs. The findings reported that the teacher candidates either viewed the edTPA as strictly a certification requirement or a learning opportunity to demonstrate skills used in their teaching practice. The teacher candidates demonstrated knowledge of their students’ backgrounds and learning needs and disclosed how university support was limited but helpful with regards to coursework.
When discussing learning opportunities and constraints, Lin (2015) indicated that such opportunities were both self-created and influenced by institutional and interpersonal contexts. Teacher candidates’ personal motivation played a role in the ways in which they perceived and experienced the edTPA as a learning opportunity. Suggestions for teacher preparation programs include reviewing sociocultural factors (i.e., institutional policies, field placements, and teacher candidates’ dispositions).

As for another teacher performance assessment, Chung (2008) performed a mixed-methods study to examine how teacher candidates reflected on learning gains, changes in teaching practices, and attitudes towards the PACT teaching event. For Chung’s qualitative component, she looked at two cases and a focus group interview. Chung used a cross-case analysis to examine teacher candidates’ experiences with the PACT, program expectations and supports in preparing for the assessment, and overall reflections. The quantitative component addressed reports gathered from the Teacher Reflection Survey.

Chung’s (2008) findings revealed that participating teacher candidates experienced learning gains related to planning a sequence of lessons that focused on a central learning goal, modifying lessons from assessments, focusing on student learning, and attending to content standards. The PACT teaching event generated increased awareness of implementing different teaching and learning strategies for English language learners as well as shifted the focus from teacher activities to student activities, including greater concern for student learning. Nevertheless, several teacher candidates complained about the amount of work and redundancy in the PACT’s prompts, but they saw value in the activities and learned from the process.

As for observed program support, Chung (2008) reported that not all teacher candidates received the same guidance. Different levels of support and scaffolding were observed from
teacher educators and cooperating teachers. Chung noted, “candidates’ experiences with the PACT depend to some degree on the how the assessment will be used—whether for a high-stakes licensure decision, for course/program completion, or simply as a formative tool for candidates’ reflection on their teaching” (p. 19). Thus, teacher candidates’ perspectives and experiences of teacher performance assessments vary given the ways in which teacher educators’ view and respond to the teacher performance assessments.

**edTPA as a Gatekeeper to the Teaching Profession?**

Existing literature on the edTPA highlights both those who advocated for the standardized assessment (e.g., Ledwell & Oyler, 2016) and others who warned of its possible harm and deprofessionalization of teacher education (e.g., Jordan & Hawley, 2016; Madeloni & Gorlewski, 2013). As researchers continue to examine the many layers of teacher performance assessments, the field of teacher education needs to consider assessments being used as gatekeepers to the teaching profession. Similar to a coin, there are two sides of the story. Policymakers, teacher educators, and teacher candidates must be aware of the ways in which teacher performance assessments can impact the livelihoods of current and future educators.

Ratner and Kolman’s (2016) research exposed concerns of possible gatekeeping and fraudulent support that could result from the implementation of teacher performance assessments. They feared that the assessments would impact the number of teacher candidates who leave and never apply to teacher preparation programs for fear of failing or not having the monetary means to pay for the assessments. Additionally, Ratner and Kolman warned that if the high-stakes nature of the teaching performance assessment continues to rise, the potential for fraudulent behavior could increase, which could inadvertently decrease the legitimacy of the assessment.
On the contrary, Ledwell and Oyler’s (2016) research disproved edTPA as a gatekeeper for their research participants, who were described as predominantly White, middle-class, and first-language English speakers with experience in academic writing. Although Ledwell and Oyler acknowledged New York’s decrease in teacher certification submissions by one-third, they projected that teacher candidates needing the most help to complete the edTPA were most likely counseled out during their coursework and field experiences. Non-completers of the edTPA were described as just as qualified as completers given that reported teacher candidates “closed the door on New York State certification and were able to successfully procure teaching positions out of state, out of the country, and in private and/or charter schools” (p. 130). From a critical perspective, does the edTPA deter highly qualified teachers out of the state and out of urban, public schools needing qualified teachers the most? 

Next, I describe how two professional mathematics education organizations have responded to and influenced reform in mathematics teaching and teacher education.

**Professional Organizations’ Initiatives in Mathematics Education**

*National Council of Teachers of Mathematics*

In 1890, there was an overall dissatisfaction with secondary education, which prompted the National Council on Education, a subset of the National Education Association, to appoint a committee to reconstruct secondary education curriculum (Osborne & Crosswhite, 1970). This committee, known as the Committee of Ten, met in 1892 to discuss nine subject-matters, mathematics included as one area of study. With mathematics as a subject of interest, the Conference on Mathematics, the appointed subcommittee, recommended studying the content

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7 Although my research may (or may not) provide insight into answering this question, I foresee further research needed to explore similar dangers that may result from high-stakes assessments. I plan to explore this area of inquiry throughout my career’s work.
areas of arithmetic, algebra, and geometry. From each content’s study, a report would be issued to address recommendations pertaining to the teaching approach, such as the sequencing of content and the level of rigor. Thus, the Committee of Ten’s primary purpose was to “provide a national force for standardizing the secondary school curriculum” (p. 168).

Response to the Committee of Ten’s report paved the way for educational reformists to reconfigure mathematics courses and the content taught within each course. National concerns for the state of mathematics education resulted in a group of mathematics teachers uniting at a 1920 NEA meeting to organize the National Council of Teachers of Mathematics (NCTM; Osborne & Crosswhite, 1970). C. M. Austin, the inaugural NCTM president, shared in the first NCTM-sponsored issue of *Mathematics Teacher* (1921) that NCTM’s purpose was to

First…keep the values and interests of mathematics before the educational world…and prefer that curriculum studies and reforms and adjustments come from the teachers of mathematics rather than from the educational reformers.

Second…furnish a medium through which teachers in one part of the country may know what is going on in every other part of the country…

Third…furnish a medium [through its journal] of expression for all of the teachers of the country…

Fourth…help the progressive teacher to be more progressive…

Fifth…[conserve and extend] the splendid work of the National Committee on Mathematical Requirement…. (as cited in Osborne & Crosswhite, 1970, p. 195)

Thus, NCTM would serve as a professional organization with a national platform to advocate for the teaching and learning of mathematics.
In the beginning decades of NCTM’s presence, “NCTM had focused on supporting mathematics teachers through the exchange and promotion of good ideas, not through its influence on educational policy” (McLeod, 2003, p. 759). NCTM continued to serve in this manner until Shirley Hill became president of NCTM from 1978–1980. Hill, who initially saw NCTM as an organization that “didn’t take firm publicized stands in backing a particular curriculum or curriculum materials,” believed that “this neutral stance was counterproductive and was not taking advantage of the potential power of professional organizations” (Hill, 2002, p. 20). Thus, Hill made a conscious effort during her presidency to unite groups who shared common goals. As a result, “NCTM underwent a major shift to a more activist political stance” where Shirley Hill says she was “not only a proponent but the primary instigator” (pp. 27–28). She felt it was important that “NCTM try to see if it could achieve consensus of its members, if it had enough common ground…to make our voices heard and our positions known, positions supported by expertise” (p. 28). Thus, Hill was credited as “turning NCTM from a generally passive organization into an activist one” (McLeod, 2003, p. 759).

Shirley Hill (2002) further described her efforts as NCTM’s president in the following:

One of the things I really tried to do, and I think accomplished for the most part, was to make the membership of NCTM believers in the fact that we could make a difference as an organization. Not just to us individually, not just within our classrooms, but in the broader realm of education in general. That really was my thrust. Whoever said that about activism was right on target, because it certainly was what I attempted to do. It is what I was and am most passionate about in my career in education. (p. 28)
With Hill’s lead, NCTM outlined recommendations for the mathematics education community in *An Agenda for Action: Recommendations for School Mathematics of the 1980s* (NCTM, 1980), which gave NCTM a united voice to enter the educational policy arena.

In the 1970s, the mathematics education community looked for “a clearer focus and sense of direction” (Hill, 1983, p. 1). During the mid-1970s, NCTM adopted a 5-year goal to develop a set curriculum for the 1980s, which resulted in NCTM’s (1980) *An Agenda for Action*. The document depicted “an official position of the NCTM and a guide for concerted action” (Hill, 1983, p. 1). Furthermore, the document served as “not just an agenda for the organization’s activities but the suggested agenda for a decade’s effort by all persons and groups concerned about mathematics education” (p. 1). The document was used to define the “basics” in school mathematics and influence policy decisions with eight proposed recommendations, which included topics of mathematics problem-solving, higher-order thinking activities, technology use, standards of effectiveness and efficiency in teaching mathematics, meaningful evaluation, opportunities for flexible curriculum, high-level demands of mathematics teachers’ professionalism, and public support for mathematics instruction. NCTM made conscious efforts to widely disseminate the document as it “signaled the Council’s determination to address itself to policy makers and the wider audience of those who influence educational priorities—not just to those within the profession itself” (p. 2). Additionally, NCTM’s (1980) *An Agenda for Action* conveyed “a message from teachers, not to teachers” (Hill, 1983, p. 4).

Shirley Hill recalled that NCTM’s (1980) *An Agenda for Action* was looked upon as “something [NCTM] could do quickly but make a point of view known, get it distributed widely, bring in allies and coalitions from other fields” (Hill, 2002, p. 29). She was responsible for appointing a committee that could write the document. Although she led several meetings with
the committee, she ended up working as part of the committee and “wrote a good deal of it” (p. 29). While writing, Hill recalled NCTM’s continued discussion about developing “a set of standards that the professional community could stand behind” (p. 30). Such discussion concurrently occurred while President Ronald Reagan’s National Commission on Excellence in Education (NCEE; 1983) reported on the conditions of American schools in A Nation at Risk: The Imperative for Educational Reform.

NCTM responded to NCEE’s call for large-scale reform as depicted in A Nation at Risk (1983) by establishing the Commission on Standards for School Mathematics in 1986. The commission worked to develop standards to address mathematics content and instructional strategies that would reflect high-quality mathematics programs (Research Advisory Committee of the National Council of Teachers of Mathematics, 1988). A year later, the commission released a draft of evaluation standards for school programs and guidelines for assessing students’ mathematical learning. With feedback from the mathematics community, NCTM published Curriculum and Evaluation Standards for School Mathematics in 1989. The publication laid the foundation for building a comprehensive vision for teaching, learning, and assessment in K–12 mathematics education (NCTM, 1989).

In short, NCTM’s (1989) Curriculum and Evaluation Standards for School Mathematics was described as “a broad framework to guide reform in school mathematics” (p. v). The publication challenged the mathematics education community to use curriculum⁸ and evaluation⁹

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⁸ Curriculum is defined as “an operational plan for instruction that details what mathematics students need to know, how students are to achieve the identified curricular goals, what teachers are to do to help students develop their mathematical knowledge, and the context in which learning and teaching occur” (NCTM, 1989, p. 1).

⁹ NCTM (1989) refers to the evaluation of both student performance and curricular programs. Evaluative measures are used to obtain and guide information pertaining to instruction that assesses student growth and achievement.
standards\textsuperscript{10} to improve the teaching and learning of mathematics. At the secondary level, the Standards\textsuperscript{11} included content recommendations to shift curriculum focused on memorizing facts and procedures to one that highlighted multiple representations and connections, conceptual understanding, and mathematical modeling and problem-solving. As for shifts in instructional strategies, the teacher would no longer “dispense information” but rather serve as a guide in facilitating learning.

Shirley Hill (2002) recalled that initially NCTM “didn’t know whether to use the word ‘standards’ in the early ‘80’s because some people might say, ‘oh well they aren’t going to tell us what [to do]’, but then suddenly…‘standards’ became all the rage” (p. 32). Additionally, NCTM faced difficulty finding funds to develop the document. Shirley Hill noted “NCTM at the time was feeling pretty strong and healthy and finally said—I love this—‘we’ll do it ourselves.’ And NCTM voted the money for Standards to be developed and consequently owed nothing to anybody” (p. 33). From her perspective:

I thought [Standards] was a very good document. I thought NCTM handled its distribution and publicity very, very well. It became, as you know, widely read, used by very influential people in legislatures, in Congress, in State Departments…many state education authorities were actually building standards with NCTM Standards in mind and very closely following the lead…it’s very powerful. (pp. 33–34)

\textsuperscript{10} A standard, as described by NCTM (1989), is “a statement that can be used to judge the quality of a mathematics curriculum or methods of evaluation” (p. 2).

\textsuperscript{11} NCTM’s (1989) Curriculum and Evaluation Standards for School Mathematics is commonly referred to as the Standards document in the mathematics education community.
As NCTM’s (1989) *Standards* landed in the hands of teachers, administrators, faculty members, and others of interest, concern for how to implement the changes in curriculum and provide adequate professional development surfaced. In 1989, NCTM established the Commission on Professional Teaching Standards. The commission worked to produce standards for teaching mathematics, evaluating the teaching of mathematics, and supporting the professional development of mathematics teachers (NCTM, 1991). Published shortly thereafter, NCTM’s (1991) *Professional Standards for Teaching Mathematics* served as a companion to NCTM’s (1989) *Standards* in determining “what teachers need to know to teach toward new goals for mathematics education and how teaching should be evaluated for the purpose of improvement” (NCTM, 1991, p. vii). NCTM’s (1991) *Professional Standards for Teaching Mathematics* proposed five shifts in the environment of mathematics classrooms, which included shifts toward creating classrooms into mathematical communities; redistributing the holder of logic and mathematical evidence from the teacher to the students; moving from procedural to mathematical reasoning; incorporating conjecturing, inventing, and problem-solving; and connecting mathematics to ideas and applications. Examples of how teachers could approach these ideas were addressed through stories and vignettes with examples and mini-scripts.

A major piece missing from NCTM’s (1991) *Professional Standards for Teaching Mathematics* was assessment. Therefore, NCTM released *Assessment Standards for School Mathematics* (1995) to align assessments with reforms. The publication encouraged exploration and investigation within the mathematics classroom. Teachers were to assess students’ understanding of mathematical concepts using multiple representations and connections to real-world applications. However, some critics challenged NCTM’s vision of assessment. For example, Romberg (1993) proposed a need for new methods of assessments to reflect the
changing times of mathematics education. He suggested mathematics teachers help students develop authentic mathematical knowledge. The resulting authentic assessments would then evaluate mathematical competence and achievement.

With critiques in mind, NCTM appointed the Commission on the Future of the Standards in 1995 to revise the original NCTM (1989) Standards document with “Standards 2000” (NCTM, 2000). As a result, NCTM published Principles and Standards for School Mathematics (2000). The publication communicated mathematical content and processes that “reflect society’s needs for mathematical literacy, past practice in mathematics education, and the values and expectations held by teachers, mathematics educators, mathematicians, and the general public” (p. xii). Furthermore, the Principles and Standards\textsuperscript{12} focused curriculum with the aid of learning resources, such as classroom examples and student work, to improve the teaching and learning of school mathematics.

In addition to addressing content and process standards for elementary, middle, and secondary grade levels, NCTM’s (2000) Principles and Standards identified six principles interwoven into high-quality mathematics education. The first principle described was NCTM’s Equity Principle, the principle of particular interest to my research. This principle dismantled the idea that only some students could learn mathematics. For equity to be achieved in the mathematics classroom, NCTM proposed three main ideas, which included “raising expectations for students’ learning, developing effective methods of supporting the learning of mathematics by all students, and providing students and teachers with the resources they need” (p. 12).

\textsuperscript{12} NCTM’s (2000) Principles and Standards for School Mathematics is commonly referred to as the Principles and Standards document in the mathematics education community.
In the first proposition, students were expected to be held to high expectations by their teachers and schools. However, there was very little description addressing the types of expectations and how teachers and their schools would achieve them. The second proposition stated that all students would have access to excellent and equitable mathematics programs. These programs would provide learning opportunities that were responsive to students’ prior mathematical knowledge, personal interests, and intellectual abilities. Although NCTM suggested teachers and schools provide assistance in meeting language and disability needs as well as access to technology, specific strategies of how to implement these expectations were not included. The last proposition described how equity requires student access to high-quality instructional programs with resources. Not only should instructional materials be available but also teachers should have the professional development training to understand students’ strengths and needs. However, the professional community was left wondering what these resources looked like and where they might receive access to them.

Thus far, NCTM’s publications revealed a new vision for the teaching and learning of mathematics that both standardized and professionalized mathematics education. As Gurl and colleagues (2016) described, NCTM set the precedent for policy and professional organizations to adopt standards as reform initiatives. In 2010, the National Governors Association and the Council of Chief State School Officers developed the Common Core State Standards of Mathematics (CCSSM; NCTM, 2014). Since the release of the CCSSM, 42 states, 4 territories, the District of Columbia, and the Department of Defense Education Activity adopted the standards to guide school mathematics curriculum (Common Core State Standards Initiative, 2017).
To aid in the enactment of policies and programs to successfully implement the CCSSM, NCTM organized a writing team made up of nine educators at universities and school districts across the United States to draft an action plan. In 2014, NCTM published *Principles to Actions: Ensuring Mathematical Success for All* to address the necessary actions that must be taken by teachers and stakeholders to ensure mathematical success for all. *Principles to Actions* identified five guiding principles for school mathematics, which included the essential elements of teaching and learning, access and equity, curriculum, tools and technology, assessment, and professionalism, in the respective order in which they appeared. Again, of particular interest to my research, I discuss NCTM’s approach to access and equity.

NCTM’s (2014) *Principles to Actions* described an excellent mathematics program as one that requires “all students have access to a high-quality mathematics curriculum, effective teaching and learning, high expectations, and the support and resources needed to maximize their learning potential” (p. 59). Students should be empowered to engage in meaningful mathematics and achieve excellence regardless of their background characteristics. Racial, gender, ethnic, and socioeconomic differences should not privilege some students over others. Thus, teachers and schools were asked to be responsive to students’ backgrounds, experiences, interests, and prior knowledge when planning, implementing, and assessing in the mathematics classroom.

Unlike NCTM’s (2000) *Principles and Standards* publication, NCTM’s (2014) *Principles to Actions* went beyond identifying the principles to addressing their obstacles and stating possible solutions to overcome them. The obstacles described include issues with quality of instruction, high-expectations, and differentiated learning opportunities. NCTM recognized that the expectations and quality of mathematics instruction could be influenced by teachers underestimating less advantaged students. Also, tracking and ability grouping could have
detrimental effects on expectations and differentiated learning opportunities. Thus, NCTM suggested reorganizing such ideas into categories of unproductive and productive beliefs.

To achieve access and equity, NCTM (2014) recommended educators “operate with the belief that all students can learn” (p. 64). Educators must engage in a growth mindset and act on high expectations. Students’ social and cultural contributions should be appreciated when designing curriculum and creating a classroom community. Educators should utilize mathematical practices outlined in CCSSM to guide mathematics instruction. Finally, to adequately support all students, NCTM required the implementation of effective intervention programs and the deployment of instructional support personnel. These solutions were then reviewed in practice through an example high school situation in the publication.

With a description of support, a vision for all students to attain mathematics proficiency, and an acknowledgement of the critical reflection needed by mathematics education programs, NCTM’s (2014) Principles to Actions provided a solution to creating, supporting, and sustaining a culture of access and equity in school mathematics. NCTM (2014) stated that Principles to Actions’ “overarching message is that effective teaching is the nonnegotiable core that ensures that all students learn mathematics at high levels and that such teaching requires a range of actions at the state or provincial, district, school, and classroom levels” (p. 4). To this day, NCTM remains involved in suggesting actions that direct the teaching and learning of mathematics. Their engagement spreads to areas such as the writing of the edTPA Secondary Mathematics Assessment Handbook (SCALE, 2016a).

Association of Mathematics Teacher Educators

While at a NCTM regional conference in 1991, a group known as the National Forum of College and University Mathematics Teacher Educators gathered to discuss the formation of an
organization that would advance the goals of mathematics teacher educators (AMTE, n.d.).

During the meeting, the group developed the Association of Mathematics Teacher Educators (AMTE), which would later represent over 1,000 teacher and teacher educator members. The professional organization, as described by the first AMTE President Mark Spikell in the first AMTE newsletter, would—

Provide a national forum…to discuss issues of mutual professional concerns [and to] share ideas on effective ways of promoting the NCTM Standards, NCSM and MAA recommendations on teaching school mathematics and developing programs to improve the mathematics education of practicing and future teachers. (AMTE, 1992)

Since AMTE’s beginnings, the professional organization released several position statements, some as joint initiatives with other professional organizations, addressing the role of elementary mathematics specialists, formative assessment in instruction, equity in mathematics teacher education, technology, and active learning in post-secondary mathematics education, in their respective order.

In AMTE’s (2015) position on equity in mathematics teacher education, equity was described in terms of providing the following: (a) access to high-quality educational experiences; (b) inclusion for all learners; and (c) respect—aimed at learners’ backgrounds and varied mathematical strengths—and engagement with others. The position charged mathematics teacher educators to create “a more just and equitable mathematics education free of systemic forms of inequality based on race, class, language, culture, gender, age, sexual orientation, religion, and dis/ability” (p. 1). Thus, mathematics teacher educators were encouraged to advocate for equitable practices; model such practices in equity-based pedagogy; elicit mathematical thinking connected to individuals’ interests, backgrounds, and cultural/linguistic knowledge; and promote
equitable opportunities for all. These recommendations are still echoed throughout AMTE’s collaborative scholarly contributions, including AMTE’s book series, peer-reviewed journals, monographs, standards documents, and other publications.

AMTE’s recent publication, *Standards for Preparing Teachers of Mathematics* (2017), stated goals, known as standards, to guide the improvement of mathematics teacher preparation programs, inform accreditation, influence policies, and encourage national dialogue on the advancement of preparation for future teachers of mathematics. Within the document, four standards were discussed in detail, which include Standard C.1. Mathematics Concepts, Practices, and Curriculum; Standard C.2. Pedagogical Knowledge and Practices for Teaching Mathematics; Standard C.3. Students as Learners of Mathematics; and Standard C.4. Social Contexts of Mathematics Teaching and Learning, as well as their related indicators. The last standard is of particular interest to my research in that the standard addresses beginning mathematics teachers’ realization that the teaching and learning of mathematics is influenced by social, historical, and institutional contexts; therefore, AMTE suggests that beginning mathematics teachers understand their responsibility to serve as advocates for each and every student. A further look at the standard’s five indicators provides more insight into what is expected of well-prepared beginning mathematics teachers.

In Standard C.4.1., AMTE (2017) suggests beginning mathematics teachers be knowledgeable about the meaning of access and advancement and how the denial of either can contribute to inequities. AMTE describes access as an essential part of cultivating equitable mathematics education. To ensure access, students must be taught by highly qualified teachers and have opportunities to be placed in higher level mathematics courses with a focus on preparing students to engage with multiple problem-solving strategies. When considering
advancement, students should be able to participate in learning content that extends beyond grade-level expectations. Such opportunities include participating in advanced (i.e., honors and college-level) courses and additional mathematics classes. Beginning mathematics teachers must be “prepared to advocate for equitable practices” by recommending students for advanced study and communicating success defined as students achieving their own goals rather than their performance on standardized assessments (p. 21).

AMTE’s (2017) Standard C.4.2. recognizes that beginning mathematics teachers “cultivate positive mathematical identities with their students” (p. 21). When beginning mathematics teachers describe what being “good” at mathematics involves, they should be knowledgeable about research and standards that provide a complex description. Thus, developing positive mathematics identities requires knowledge of what students must know and be able to do. The standard also describes how beginning mathematics teachers must “actively position all learners as mathematical doers” (p. 22) and foster students’ positive mathematical identities by providing opportunities for students to reflect during classroom discourse, tasks, and assessments.

In Standard C.4.3., AMTE (2017) describes the ways in which beginning mathematics teachers should provide students with equitable learning opportunities built from high-quality curriculum that incorporates students’ cultural, linguistic, and mathematical strengths. Students’ differences should be viewed as “strengths and resources upon which to build” (p. 22); thus, students’ diverse backgrounds and experiences should be valued and recognized as funds of knowledge. Additionally, beginning mathematics teachers must be “prepared to challenge deficit-based thinking in schools and reflect on their own practices in terms of building upon the cultural, linguistic, and unique ways of knowing of their students” (p. 23).
The fourth indicator, AMTE’s (2017) Standard C.4.4., addresses the need for beginning mathematics teachers to be knowledgeable about the historical context of mathematics education, including the roles of power, privilege, and oppression that results in inequitable learning experiences for students. They must also be cognizant of education’s national reform movements, such as NCTM’s (2000) *Principles and Standards*, NCTM’s (2014) *Principles to Actions*, and state mathematics standards, as well as consider how “mathematics operates with power and privilege in society” (AMTE, 2017, p. 23). AMTE advises that beginning mathematics teachers be “well grounded in literature that presents strategies for transforming schooling for students who have historically been denied access to a quality mathematics education and implement these practices in their classrooms and schools” (p. 23). If beginning mathematics teachers are knowledgeable of the literature, they can raise awareness of and challenge observed inequitable practices.

In the last indicator, AMTE’s (2017) Standard C.4.5. suggests that beginning mathematics teachers be “knowledgeable about, and accountable for, enacting ethical practices that enable them to advocate for themselves and to challenge the status quo on behalf of their students” (p. 24). Thus, beginning mathematics teachers are charged with exercising ethical practices in their work with students, families, colleagues, and communities. They must also challenge stereotypes, deficit-based thinking, and general messages of negativity when it comes to doing mathematics. By being accountable for their actions and the actions of others, beginning mathematics teachers can hold themselves to high ethics where what is implemented in the classroom is of best interest for students to experience “meaningful and humane mathematical experiences” (p. 24). Therefore, AMTE suggests, “well-prepared beginners accept that teaching is a political activity” and “teaching sometimes requires acts of creative insubordination” (p. 24).
With skills to question inequalities and advocate for access to high-quality mathematics teaching and learning for all students, beginning mathematics teachers can be accountable for their roles as teachers and leaders in society.

**Navigating Reform in Mathematics Teacher Education**

Teacher educators must grapple with what is communicated, both socially and politically, about school mathematics through teacher performance assessments and professional mathematics education organizations’ standards. Additionally, teacher educators must consider how these responses influence what is prioritized in teaching future teachers. A brief look at the initiatives found in the edTPA and the mission of NCTM standards reveal commonality in the push for prospective teachers to use academic language and develop opportunities for conceptual understanding, procedural fluency, and mathematical reasoning and problem-solving skills (NCTM, 1991, 2000; SCALE, 2016a). However, how one influences or hinders the other in teacher preparation, as described by mathematics teacher educators, has yet to be researched.

Through a sociopolitical lens, this study analyzes secondary mathematics teacher educators’ responses and experiences navigating edTPA and professional mathematics education organizations’ initiatives to reform mathematics teaching and teacher education. Additionally, examination of how secondary mathematics teacher educators interweave each in their preparation of prospective teachers provides insight into the ways in which teacher educators create, support, and sustain a culture of access and equity in the teaching and learning of mathematics. As Gorlewski (2016) stated, “Educators are charged to balance the extremes of equity and excellence to expand opportunities for all learners” (p. vi). Thus, I contribute needed research in how secondary mathematics teacher educators respond to the raised expectations and increased accountability initiatives when preparing future mathematics teachers.
CHAPTER 3
THEORETICAL FRAMEWORK

Over the last century, research in mathematics education evolved as a result of mathematicians and educators exploring beyond the writing of mathematics textbooks to the practice of teaching and learning mathematics (Kilpatrick, 1992). Those who contributed to the study of mathematics education brought various definitions and theoretical perspectives to a relatively “new” field of academic research (Valero, 2004). In this chapter, I present a historical review of mathematics education research mapped within Stinson and Bullock’s (2012, 2015) four theoretical paradigms of inquiry. The four “shifts or historical moments” include the process–product moment (1970s–), the interpretivist–constructivist moment (1980s–), the social-turn moment (mid 1980s–), and the sociopolitical-turn moment (2000s–). Despite the theoretical shifts framing mathematics education research within defined, chronological periods, the shifts are flexible in nature, such that some occur simultaneously and overlap one another (Stinson & Bullock, 2012). (See Table 2; Stinson & Walshaw, 2017.) I discuss where my research falls within these theoretical paradigms and how an assemblage of Felton-Koestler’s (2017) What, Who, and How framework and Gutiérrez’s (2007a) equity framework complemented the philosophical and methodological underpinnings needed to explore my inquiry.

A Brief Historical Review of Mathematics Education Research

Since the beginning of the 20th century, researchers from the disciplines of mathematics and psychology influenced the trajectory of mathematics education research (Kilpatrick, 1992). Where mathematicians focused on the mathematics content, psychologists looked at mathematical thinking and cognition. Stinson and Bullock (2012, 2015) identified contributions
made during this foundational period of mathematics education research as those residing in the process–product moment (1970s–). Grounded in a positivist (or post-positivist) paradigm, researchers in this shift used quantitative statistical inferences to predict social phenomena, such as linking classroom practices with student achievement outcomes or “products” (Stinson & Bullock, 2015).

**Table 2**

Mapping Moments of Mathematics Education Research to Paradigms of Inquiry

<table>
<thead>
<tr>
<th>Paradigms of Inquiry</th>
<th>Predict</th>
<th>Understand</th>
<th>Emancipate</th>
<th>Deconstruct</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Positivist</em></td>
<td><em>Interpretivist</em></td>
<td><em>Critical</em></td>
<td>*Poststructural/*Postmodern</td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>Social Constructivist</td>
<td>Critical Race Theory<em>Feminist</em></td>
<td>Postcritical</td>
<td></td>
</tr>
<tr>
<td>Quasi-experimental</td>
<td>Radical Constructivist</td>
<td>Latino/a Critical Race Theory*Postcolonial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed Methods&gt;</td>
<td>Sociocultural&gt;</td>
<td><em>Theory</em></td>
<td>Posthumanist</td>
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<tr>
<td></td>
<td>Phenomenological</td>
<td>Critical Theories of Race*Post-Freudian</td>
<td></td>
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<tr>
<td></td>
<td>Ethnicographic</td>
<td><em>Participatory Action Research</em></td>
<td>&lt;Discourse Analysis</td>
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<td></td>
<td>Symbolic Interaction</td>
<td>Critical Ethnography</td>
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</table>

The Break in the original Lather and St. Pierre table indicated a shift from the Enlightenment humanist paradigms on the left to the post-Enlightenment, posthumanist paradigm on the right. Here it indicates a hybrid, in-between space where the researcher might adopt a critical postmodern theoretical tradition (see Stinson & Bullock, 2012, 2015).

Paradigms of Inquiry adapted from Lather and St. Pierre in (Lather, 2006, p. 37).

Wishing to improve and advance the teaching and learning of mathematics, mathematicians designed school and college curriculum, proposed reasoning processes, and suggested ways to teach the processes (Kilpatrick, 1992). Embedded within these contributions

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to the study of mathematics were strong links to “dominant systems of reason in the white, Western world” (Valero, 2004, p. 8). However, with time, ways of viewing mathematics from a non-Eurocentric perspective would surface (e.g., Bishop, 1988; D’Ambrosio, 1984).

Psychologists, guided by different schools of psychology (e.g., behaviorism, constructivism), researched how individuals learned mathematics (Kilpatrick, 1992). In response to NCEE’s (1983) *A Nation at Risk* and other educational reform efforts to raise school expectations and increase the focus on individuals’ achievement abilities, psychologists developed “tools to name, describe and measure the way in which students [were] expected to think and behave within particularly socially valued systems of reason” (Valero, 2004, p. 8). However, as researchers used these tools in their studies, students were divorced from their social identities and, instead, viewed as cognitive subjects who engaged with mathematical thinking processes (Valero, 2004).

To acknowledge the personal engagement with the teaching and learning of mathematics (e.g., classroom interactions, pedagogical practices), researchers began to incorporate qualitative research techniques to understand the social phenomena. Stinson and Bullock (2012, 2015) described this shift as the interpretivist–constructivist moment (1980s–). In this moment, interpretivist researchers conducted research “to understand social phenomena by attempting to access the meaning(s) that people assign to social phenomena” (Stinson & Bullock, 2015, p. 7), whereas the constructivist researchers examined understanding through “how people acquire or construct different meaning(s) over time” (p. 8). Mathematics education researchers studied mathematics for its use of pedagogical methods (i.e., collaboration, peer interaction, and teaching interventions) in various contexts (Chronaki, 1999). From this research, other compounding interests, such as socialization and multiculturalism in the classroom, increased the awareness of
the prevailing social interactions that occurred while learning mathematics. As a result, the construction of mathematical knowledge would later be studied for its relation to social as well as cultural and political matters in the succeeding shifts.

**The Social Turn in Mathematics Education**

To understand the precursors to the “social turn” in mathematics education, one must be acquainted with the societal changes of the time. As previously discussed, the 20th century brought awareness for mathematically literate citizens to engage with advancements in the fields of science, technology, and computers (Chronaki, 1999). Consequently, employment opportunities not only increased interest in higher education pursuits but also raised academic qualifications, particularly in mathematics. The growing study of mathematics extended beyond mental exercises to applications; thus, society’s use of mathematics in practical activities found in real-life contexts exposed the social aspects of the field.

Prior to the 1980s, studies in epistemology and ontology focused on the individual and how knowledge was acquired through cognition. Mathematical and psychological contributions dominated mathematics education research. Near the mid-1980s, theoretical frameworks, such as sociocultural and constructivist theories, were introduced that addressed the social origins of knowledge and consciousness (Lerman, 2001). Researchers considered social factors—interactions among learners—and social concerns—awareness of the democratic and humanistic concerns of teachers—in guiding their work. Lerman (2000) described this shift in research as the “social turn,” where mathematical meaning, thinking, and reasoning were acknowledged as products of social activity.

The following contributions from fields of socio-cultural psychology, anthropology, and sociology presented new ways of recognizing mathematics from a social orientation in
community settings. During 1988, Lave published *Cognition in Practice: Mind, Mathematics and Culture in Everyday Life*, which studied mathematical practices found in out-of-school settings (i.e., dieting and grocery shopping). Studying the ways in which people used arithmetic problem-solving and engaged in reasoning and decision-making skills in social situations bridged the study of cognition to culture and contexts. Nunes, Schliemann, and Carraher’s (1993) *Street Mathematics and School Mathematics* and other related researchers’ publications examined mathematics learning beyond the classroom to participating in communities of practice.

In addition to studying mathematics in the community, Walkerdine published *The Mastery of Reason: Cognitive Development and the Production of Rationality* (1988). In this text, Walkerdine examined young children as they learned mathematics and, more specifically, engaged in “the social production of language and thinking” (p. 1). She proposed a need to “rethink how we might understand linguistic and cognitive development and their relation to pedagogic practices” (p. 212). Furthermore, her work revealed the ways children come to signify and construct meaning through social contexts both in and out of school settings.

Simultaneously, Bishop published *Mathematical Enculturation: A Cultural Perspective on Mathematics Education* (1988), which explored mathematics as a cultural product. He identified six mathematical activities—counting, locating, measuring, designing, playing, and explaining—used by cultures around the world. He also proposed an enculturation curriculum that consisted of symbolic (concept-based), societal (project-based), and cultural (investigation-based) components. Bishop’s look at mathematics from various cultures, similar to the work of D’Ambrosio’s (1984) conceptualization of ethnomathematics, raised awareness of knowing, explaining, and understanding mathematics from diverse cultural contexts.
These contributors and the concerns for greater democratization—a shift of authority from teachers to students—and equity—efforts to increase opportunities for all students to engage with mathematics and pursue certification—played a role in the “social turn” of mathematics education. Next, I describe a sociocultural perspective, a perspective from the social-turn moment that oscillates between the theoretical paradigms of “understand” and “emancipate” (see Table 2; Stinson & Bullock, 2015).

A Sociocultural Perspective

One way in which researchers considered mathematics for its meaning, thinking, and reasoning that occurred in social contexts and activities was through a sociocultural perspective. Given that this perspective contributes to my lens from which I explore my inquiry, I highlight its major contributions and address the perspective’s roots, goals, and concerns.

Wertsch, del Río, & Alvarez (1995) described the sociocultural perspective as a lens to “explicate the relationships between human action, on the one hand, and the cultural, institutional, and historical situations in which this action occurs, on the other” (p. 3). Thus, the goal of the sociocultural perspective is to acknowledge how cultural experiences and contexts are interwoven into human actions (e.g., learning, engaging, reasoning) with mathematical ideas. By focusing on the social aspects of mathematics education, researchers study the ways in which teachers, texts, and students’ previous experiences frame mathematical activities. Additionally, researchers consider collaborative interactions between teachers and students occurring in learning situations. They also examine classroom cultures and learning environment structures that transpire when students engage in mathematical reasoning and problem-solving. Thus, researchers acknowledge the social dynamic found in teaching and learning mathematics.
There are numerous contributors who have added to this body of work. For example, Vygotsky (1896–1934) explored consciousness, intellect, and the zone of proximal development. His well-known publications *Mind in Society: The Development of Higher Psychological Processes* (1978) and *Thought and Language* (1994), for instance, addressed social behaviors and psychological processes. His work described learning and cognition as occurrences in activity, culture, and context. Similarly, Lerman (2001) presented a cultural, discursive psychology framework. His framework viewed learning, and the meanings developed within, as part of social practices. He identified “students as speakers and actors of mathematics in school classrooms, the student-in-mathematics-classroom-in-student” (p. 98). As previously described, the work of Bishop (1988) looked at learning through enculturation and the act of participating and belonging to a community. Here, students learned through their participation in the language, behavior, and cultural norms of a social group and their adoption of such beliefs and practices to belong to the culture.

Some researchers, therefore, use a sociocultural perspective to understand social phenomena through sociocultural contexts. In this case, the aim is to acquire knowledge through one’s interpretation or construction of meaning of the universe (Stinson & Bullock, 2015). On the other hand, yet sometime oscillating between both, researchers use a sociocultural perspective to build theory that falls within the emancipate paradigm. Here, knowledge is produced (or reproduced) to acknowledge “systems of hegemonic domination and oppression” (Stinson & Bullock, 2015, p. 10). Concerns for power, social justice, transformation, and equity are critically explored. How researchers focus their lens on the socio-cultural and -historical origins of the social-turn moment allows for further exploration in “emancipation from or
deconstruction of social phenomena rather than a mere understanding” (p. 44), which signals the shift in the sociopolitical-turn moment (2000s–).

A Sociopolitical Perspective

As part of Lerman’s (2000) “social turn,” he recognized that “the receptivity of the mathematics education community to social theories was due more to political concerns that inequalities in society were reinforced and reproduced by differential success in school mathematics, than social theories of learning” (p. 24). Thus, Lerman suggested that some researchers shared political concern for students being privileged over others when learning mathematics. Next, I identify key researchers and theorists who have explored the social and political dimensions of mathematics education in what Stinson and Bullock (2012, 2015) identify as the sociopolitical-turn moment. This shift, similar to the social-turn moment, oscillates between two theoretical paradigms of inquiry, the emancipate and deconstruct paradigms. In the deconstruct paradigm, “concepts of knowledge, being, good, and so forth are contested and destabilized” (Stinson & Bullock, 2015, p.10), which opens the door for multiple (and uncertain) possibilities “through the discourses and discursive practices of power in contexts” (p. 10).

The early traces of research addressing the political dimensions of mathematics were linked to researchers from Norway and Denmark (Valero, 2004). Mellin-Olsen is one of these researchers. His publication The Politics of Mathematics Education (1987) brought awareness to the political aspect of mathematics education. He argued that those who failed to learn mathematics failed to understand mathematics’ influence in societal services (e.g., administration, economy, industry) and the reproduction of society. Thus, mathematics played a role in oppression, resistance, and the production of culture. He built his work from the ideas of Freud and Bateson as well as Activity Theory, a theoretical perspective that he described as
“learners always [having] some important knowledge which is significant for the learning process, knowledge which should thus be recognised by the curriculum maker” (p. 18). His work set the stage for looking at mathematics from a political viewpoint, one where “some pupils are prevented from an important field of knowledge because of the design of the curriculum or the mechanisms of the examination system” (p. 191).

Similarly, Valero (2004) described learning mathematics as a “highly political and social act that needs to be understood in full connection within the multiple contexts in which that activity and practice unfolds” (p. 17). Valero recognized political concern through the concepts of power, critique, and context as factors contributing to the “socio-political trend” in mathematics and mathematics education research. Her work described the many interpretations of power (i.e., mathematics as empowering and a powerful knowledge versus mathematics as a tool of power) and how they could be used.

For example, mathematics can empower people to become better citizens. As previously discussed, mathematically literate citizens can seek distinguished employment opportunities. They can have the mathematical skills to fulfill dreams and teach others, which means that mathematics gives them power through their knowledge of mathematical concepts. As Valero (2004) cautioned, “saying that mathematics is powerful means that mathematics in itself can exert power, what implies that mathematics is given the status of a social agent” (p. 13). When mathematics gains life through power, it can then be used as a tool of power.

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14 I recognize that the word “empower” can be used in different contexts. In this example, empower refers to individuals given authority to execute an initiative. Thus, an individual who is empowered is equipped, authorized, and entitled to something because of their knowledge of mathematics. However, I must acknowledge that “empower” can also be used to describe an individual acquiring the strength and confidence to control a situation. In this case, the term represents self-empowerment, where individuals feel emancipated, liberated, and encouraged to claim their rights. I argue that a distinction in the word use must be made and a careful examination of the ways mathematical knowledge can contribute to each be considered.
In this case, power can be used against others. For example, a person in a debate can use statistical data and its interpretation as power over another to win. Power can determine who has resources over others, which factors into social hierarchies. As Valero (2004) described, power serves as a “capacity of some people—or groups of people—to keep others in their condition of excluded” (p. 14). Thus, power factors into the struggle between inclusion and exclusion, and mathematics serves as a tool of power.

This struggle of power can also be seen in ethnomathematics given that it “emerged from intellectual influences of emancipatory struggles worldwide” (Powell & Frankenstein, 1997, p. xi). For instance, Powell (2002) discussed how ethnomathematics “departs from a binary mode of thought and a universal conception of mathematical knowledge that privileges European, male, heterosexual, racist, and capitalistic interests and values” (p. 3). Thus, ethnomathematics recognizes power struggles, which acknowledges the discipline’s political nature.

Similarly, critical mathematics education uses critique to explore mathematics as “symbolic power” (Skovsmose, 1994) that is responsible for inequalities and discrimination. Skovsmose’s (1994) *Towards a Philosophy of Critical Mathematics Education* described the constructs of crisis, critique, and emancipation, all key components when adopting a critical position. Skovsmose identified a crisis as a dilemma or critical situation that can be reacted to through critique. When one engages in critique, one participates in an activity of judging and problem-solving out of the dilemma. A possible result of critique is emancipation and transformation. For mathematics education to be critical, Skovsmose asserted, “it has to take into consideration the critical background of schooling and to try to develop possibilities for an awareness of conflicts as well as to provide competencies which are important for dealing with such critical situations” (p. 24). Similarly, Skovsmose (2016) addressed the politics of meaning
in mathematics education. He explored politics of meaning through issues of racism, sexism, instrumentalism—students’ meaning-making as it relates to students’ schooling experiences such as mastering mathematics to pass a test—and the school mathematics tradition—mathematical activities guided by texts and problem-sets to develop meaning. These politics of meaning can be tied to the concerns addressed in critical mathematics education research.

Nevertheless, a possible conflict found in mathematics and mathematics education is power. Valero (2004) indicated that the “examination of power requires critique as a means to offer a counterpart to naïve views about the way in which mathematics and mathematics education are implicated in the creation and maintenance of particular social structures” (p. 15). When mathematics is legitimized at the expense of others by means of power, researchers and educators can engage in critique and reflection to problem-solve possible solutions.

In addition to Valero’s (2004) account of a “socio-political trend,” Gutiérrez (2013a) described the growing body of researchers turning their attention to the political tensions of mathematics and mathematics education as the “sociopolitical turn.” She attributed the sociopolitical turn to the “shift in theoretical perspectives that see knowledge, power, and identity as interwoven and arising from (and constituted within) social discourses” (p. 40). She recognized three perspectives, which include critical mathematics education, critical race theory and Latin@ critical theory, and poststructuralism (and postmodernism), as contributors to the sociopolitical turn.

Even though critical mathematics education was previously addressed, Gutiérrez (2013a) included mathematics curriculum reform research with a focus on equity and social justice issues within this perspective. Frankenstein’s (1990) work looked at equity issues in gender and class through critical mathematical literacy curriculum. She used critical mathematical literacy
curriculum as a way to show how mathematics can be used in identifying, understanding, and challenging equity issues. Similarly, Gutstein’s (2003, 2006) work addressed the need for students to use mathematics to understand their lives as well as the sociopolitical dimensions of the world. His publication *Reading and Writing the World with Mathematics: Toward a Pedagogy for Social Justice* (2006) suggested ways for students to explore and critique issues of injustice, while also problem-solving for social change. Both researchers, among others (e.g., Andrew Brantlinger, Mathew Felton-Koestler, Susan Gregson), seek to understand and challenge the status quo through critical mathematics education.

Other perspectives Gutiérrez (2013a) mentioned in the sociopolitical turn were critical race theory and Latin@ critical theory as well as poststructuralism (and postmodernism). Although my research does not pull from these perspectives, I briefly acknowledge each to recognize their contribution to the sociopolitical perspective. In critical race theory (CRT), Ladson-Billings and Tate (1995) described three factors that contribute to social inequity in education, which include race, a society built on property rights, and the intersection of both. Their work used CRT to recognize racism and disrupt the status quo. Likewise, Latin@ critical theory (LatCrit theory) also focuses on racism and how transformational resistance through social activism can be used to deconstruct racial hierarchy (Solórzano & Delgado Bernal, 2001).

As for poststructuralism (and postmodernism), various contributors (e.g., Jacques Derrida, Gilles Deleuze, Michel Foucault, Margaret Walshaw) look at how individuals make sense of themselves and their world based on the discourses they negotiate. Thus, students see themselves as successful (or not) based on how they negotiate these discourses within the classroom. Therefore, a sociopolitical perspective can provide insight into how students identify and position themselves in mathematical practices.
Curriculum Through a “New” Lens

The social- and sociopolitical-turn moments in mathematics education research not only illuminated new ways of looking at mathematics but also altered the “what” and the “how” mathematics should be taught. Initially, mathematics as a mental discipline favored curriculum that practiced the skills of specific content and problem sets (Chronaki, 1999). Thus, the learning of mathematical content was abstract and decontextualized. Gutiérrez (2013b) described this mathematics being concerned with the truth and not social phenomena. With sociocultural and sociopolitical perspectives influencing new curriculum, classroom activities reference real-world applications of the mathematics content (Chronaki, 1999). The ways in which students engage with the applications and make sense of it in their personal lives play a role in acknowledging the social aspect of the curriculum. Nevertheless, each perspective contributes to its unique objective.

In brief, curriculum from a sociocultural orientation provides “an appealing context that can facilitate the learning of some predetermined knowledge” (Chronaki, 1999, p. 21). With the aid of cultural tools and manipulatives, teachers could work with students to make mathematical concepts tangible and relatable. For example, the concept of fractions could be explored using candy bars, pizza, or Cuisenaire rods. Students could also acknowledge their own culture and social experiences in the classroom (Lerman, 1998). Furthermore, communication could serve as a cultural tool (Vygotsky, 1994). As students communicate their own mathematical ideas and justify their reasoning, teachers and students could learn from one another (Cobb, 1994).

Whereas a sociocultural perspective engages in analytical thinking with students as active participants in the construction of their own knowledge, a sociopolitical perspective focuses on critical thinking as students participate in tasks that require them to reflect on mathematics as it
relates to social affairs (Chronaki, 1999). From a sociopolitical perspective, curriculum acknowledges authentic contexts, rooted in social and cultural experiences, as the foundation for mathematical activities. Students are encouraged to reflect on how mathematical knowledge is communicated and applied. As the social role of mathematics comes into question, students can evaluate their responsibility as mathematically literate citizens. Thus, the sociopolitical curriculum empowers students to confront implicit and explicit conflicts such as discrimination, resistance, and oppression (Chronaki, 1999). As for the mathematics teachers teaching the curriculum, they “contribute to the identities students construct as well as constantly reproduce what mathematics is and how people might relate to it (or not)” (Gutiérrez, 2013b, p. 11). So, what does this conceptualization mean for teacher preparation programs preparing mathematics teachers to engage in curriculum with a sociopolitical orientation?

As best said by Gutiérrez (2013a), “The standardization of the curriculum and the focus on high stakes tests (at least in the United States) leave teachers with little room to reflect upon how such students are constructing themselves and being constructed with respect to mathematics” (p. 37). Thus, teacher preparation programs must adopt curriculum that provides prospective teachers with the necessary tools to engage in critique while combatting the additional pressures of standardization, assessment, and professionalization. Teacher educators “must expand what [they] consider to be necessary knowledge for teaching, adding political knowledge for teaching” (Gutiérrez, 2013b, p. 9). Once prospective teachers acquire the skills to critique mathematics for what it is and how it is constructed in the classroom, they can guide their students to do the same.

Mathematics teacher education curriculum reform from a sociopolitical perspective needs to engage and support prospective teachers in new ways of looking at content, tasks, instruction,
and assessment. When prospective teachers enter teacher preparation programs, they bring knowledge of mathematics content and pedagogy reflective of their past experiences. Some prospective teachers may view mathematics as static facts and procedures that are disconnected from social and political contexts. When prospective teachers view mathematics as a “depoliticized body of knowledge” (Felton & Koestler, 2012, p. 25), they refrain from taking an active role as teachers in communicating the relevance of mathematics. Curriculum content that illuminates this disconnect can bring awareness to prospective teachers needing space to grapple with the social and political dimensions of mathematics. Thus, prospective teachers must engage with content that looks at mathematics for what it is and whom it impacts.

In teacher preparation programs, prospective teachers must have opportunities to discuss “the nature of mathematics (i.e., What is mathematics?), deconstruct prevailing discourses in education with a community of teachers who seek to reclaim the profession and humanize the mathematics classroom, and interact with more experienced teachers who model political conocimiento\(^\text{15}\)” (Gutiérrez, 2013b, p. 16). By engaging in these tasks, prospective teachers will develop political clarity where they recognize mathematics as political and, subsequently, mathematics teaching as political (Gutiérrez, 2013b). Those with political clarity will then have the knowledge and confidence to articulate to others their views and, ultimately, take action.

When planning for instruction, prospective teachers must consider the what, the who, and the how of mathematics as it relates to social affairs and constructs (Felton, 2010b). By viewing mathematics as more than concepts, prospective teachers can help students contextualize

\(^{15}\) Gutiérrez (2013b) used the term conocimiento, analogous to knowledge, to describe all that must be politically understood, explained, and negotiated (e.g., deficit discourses, high-stakes assessments, how to advocate for historically underserved and/or marginalized students, oppression in schools, standardized curricula).
mathematical ideas and explore what mathematical stories are about, including their own. Prospective teachers should also serve as facilitators who guide social conversations in the classroom. As their students engage in conversations about mathematical issues, the students can determine how they relate (or not) to the mathematics. When students have opportunities to “see themselves in the curriculum (mirror) as well as have a view onto a broader world (window)” (Gutierrez, 2007a, p. 3), they can better understand both mathematics and the world.

Additionally, prospective teachers must learn how to “continually and critically reflect as they teach (and learn) so that they begin to recognize and understand the cultural, social, and political contexts in which their work takes place” (Felton & Koestler, 2012, p. 25). Therefore, one must identify, question, and critique established assumptions of oneself as well as schools and society for social and political implications (Felton, 2010a). Assessment that includes critical reflection can bring attention to the importance of understanding mathematics as more than just numbers and equations. Thus, considering critical reflection as a factor in assessment provides opportunities for prospective teachers (and their future students) to discuss the many dimensions and implications of mathematics.

Mapping My Research Lens

Where my research falls in Stinson and Bullock’s (2012, 2015; see Table 2) map of moments of mathematics education research oscillates between the social- and the sociopolitical-turn moments, with a predominant emphasis in the sociopolitical-turn moment (see Figure 1). I make this statement given that my work first gathers an understanding of the ways in which secondary mathematics teacher educators respond to reform in mathematics teacher education when navigating the edTPA and professional organizations’ initiatives. By engaging with the teacher educators, I learn of the ways they have constructed meaning from what these initiatives
communicate. Then, my insight into their actions and experiences responding to the social context of reform assists with my understanding of the social phenomena, which I later place under a critical lens. The use of a critical lens is two-fold in that it enables me to (a) expose reform for its power and authority influencing the preparation, instruction, and assessment of prospective secondary mathematics teachers; and (b) deconstruct what initiatives communicate about the direction of mathematics teacher education.

Figure 1: Tracing the Evolution of Mathematics Education Research. A diagram charting my paradigm of inquiry in moments of mathematics education research.

I use Figure 1 to acknowledge the fluidity of my research lens oscillating between different paradigms of inquiry and moments of mathematics education research. I argue that research, such as my own, should not be confined to a single paradigm given that it may limit the scope of the work, including its development, analysis, and dissemination. Likewise, mathematics education researchers should not feel restricted to mapping their work within defined moments. Although Stinson and Bullock (2012, 2015) use four moments to trace
mathematics education research through time, what transpires in today’s research may contribute to a new moment, yet to be identified. Thus, researchers must be knowledgeable of the foundations from which researchers warrant their work, but they should also experience the freedom to appropriately select what is best for their inquiry, even if this means exploring uncharted territory.

**An Assemblage of Theoretical Frameworks**

In my search to find the theoretical framework that would complement my philosophical and methodological underpinnings, I discovered Felton-Koestler’s (2017) work that addressed prospective mathematics teachers’ understandings of the social and political issues of mathematics teaching and learning. More specifically, he looked at three dimensions—the what, who, and how of mathematics—and the way these questions provided insight into “the relationship between the ‘problem context’ and the mathematical narratives people construct in response to these problem contexts” (Felton, 2010b, p. 122). Although these questions exposed information regarding mathematical activity in terms of a “problem context,” which was further defined as generic word problems and open-ended tasks, I argue that the same questions can be applied to problem contexts described as reform initiatives communicated by prompts found in the edTPA and standards proposed by NCTM and AMTE. A closer look at the relationship between the reform initiatives and the constructed responses of those who engage with them can bring awareness to the ways mathematics education is viewed as a social and political activity.

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As I began my research, I realized Felton-Koestler’s (2017) What, Who, and How framework would serve as one lens to view the social and political dimensions of particular reform efforts in mathematics education. This realization became obvious as I spoke with my participants about preparing prospective secondary mathematics teachers for the social contexts of mathematics teaching and learning. As the participants shared their experiences implementing activities and facilitating discussions, topics pertaining to access, achievement, identity, and power surfaced (some topics more than others). One participant even asked if I planned to question him about Gutiérrez’s axes of equity. While I was familiar with Gutiérrez’s (2007a) equity framework, I had not considered using the framework as a lens to potentially define and deconstruct the social contexts of mathematics teaching and learning. I reviewed AMTE’s (2017) Standard C.4., which originally contributed to my inquiry, and saw Gutiérrez’s (2007a) four dimensions of equity (i.e., access, achievement, identity, and power) dispersed throughout the work. Although I am aware that Gutiérrez served on the writing team and may have contributed her own expertise to the standard, I find the equity framework as a helpful lens through which to explore my inquiry. Thus, an assemblage of Felton-Koestler’s (2017) What, Who, and How framework and Gutiérrez’s (2007a) equity framework is essential for me to use to address the lens from which I critically frame and analyze my work.

Felton-Koestler’s What, Who, and How Framework

As a mathematics teacher educator, Felton-Koestler observed prospective teachers’ uncertainties relating mathematics to real-world concepts and incorporating social and political

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17 I acknowledge Gutiérrez’s (2007a) conference proceeding as the first publication that thoroughly described the equity framework and its four dimensions (i.e., access, achievement, identity, and power). Although, Gutiérrez published influential pieces (e.g., 2002, 2007b) contributing to the framework and has since published other works (e.g., 2009b) elaborating on the framework, I cite Gutiérrez (2007a) for consistency purposes (unless otherwise stated).
issues in their lessons. He wrote of his experience in Felton-Koestler, Simic-Muller, and Menéndez’s (2017) *Reflecting the World: A Guide to Incorporating Equity in Mathematics Teacher Education*, where he and his colleagues presented lessons to equip future (and current) teachers with the tools to make mathematics relevant and address issues of equity. Throughout the text, teachers are reminded that they must decide what knowledge is privileged (and silenced) in the classroom and in what ways mathematics relates to the world (e.g., prevalent injustices in society). Thus, prospective mathematics teachers are encouraged to be aware of integrating and reflecting on concerns of equity, social justice, and diversity in their mathematics classrooms.

Felton-Koestler (2017) introduced the What, Who, and How (WWH) framework as a guide to understand prospective teachers’ views of mathematics education as sociopolitical. Situated in social justice and critical mathematics literature, the framework draws attention to the complexity of prospective teachers’ beliefs and how such beliefs can inform the teaching and learning of school mathematics. The framework considers a series of questions—“What messages we send about mathematics and the world, Whose perspectives are represented in mathematics, and How mathematical concepts and our world are related”—to understand the social and political dimensions of mathematics (p. 49). Although Felton-Koestler used the WWH framework to explore prospective teachers’ views, he mentioned that the framework’s questions were “intentionally broad as they [could] be used to focus one’s attention in a variety of research and instructional settings” (p. 51). Additionally, the framework was “not a definitive accounting of PT [prospective teachers’] views” (p. 51), as it was versatile and applicable to understanding others’ views.

In the following sections, I describe Felton-Koestler’s (2017) series of what, who, and how questions in further detail. I also use the questions to draw attention to SCALE’s (2016a)
edTPA Secondary Mathematics Assessment Handbook and NCTM’s (2014) Access and Equity Principle to understand what each communicates about school mathematics. Although the documents exist as one contribution of many from SCALE and NCTM to reform mathematics education, I focus my attention on these documents as they are both relevant to my research and influential to my participants’ responses.¹⁸

The what. A closer look at the context in which a problem (or reform initiative) is situated can contribute to a broader message of what is communicated about mathematics teaching and learning with respect to the social world (Felton, 2010b). Those who engage with the problem (or reform initiative) may view the context as “politically neutral” in nature, while others may view it as “politically charged” or “sociopolitical” in nature. Similar to Gutstein and Peterson (2005) who viewed all mathematics problems as sociopolitical in nature, I assert that reform initiatives proposed by SCALE, NCTM, and AMTE, for example, can also be understood as sociopolitical in nature in that they can be used to challenge or support the status quo. Felton-Koestler’s (2017) WWH framework further categorizes the views of mathematics teaching and learning as sociopolitical in nature by (a) recognizing mathematics as “coconstructed” with other social constructs and (b) acknowledging mathematics as a role of social analysis.

In the former category, Felton-Koestler (2017) defined coconstructed as a shared construction of school mathematics with other social constructs such as culture, race, gender, and

¹⁸ During my interviews with my participants, all nine participants expressed that they were knowledgeable about SCALE’s (2016a) edTPA Secondary Mathematics Assessment Handbook and NCTM’s (2014) Access and Equity Principle. The participants used a variety of resources from SCALE and NCTM in their methods courses. Although some of the participants were aware of AMTE’s (2017) Standards for Preparing Teachers of Mathematics, the participants expressed that they had not read the entire document or used it when preparing for their methods courses. A future research interest is to apply the what, who, and how questions of Felton-Koestler’s (2017) WWH framework to AMTE’s (2017) Standards for Preparing Teachers of Mathematics and relate this analysis to how secondary mathematics teachers respond.
socioeconomic status. The interweaving of school mathematics with, for example, gender (i.e., mathematical problems describing class in terms of boys and girls) can reinforce a gender binary as normative. Similarly, mathematical problems addressing race and achievement can reinforce power relations. I look at NCTM’s (2014) Access and Equity Principle and SCALE’s (2016a) *edTPA Secondary Mathematics Assessment Handbook* to see what (if any) messages pertaining to school mathematics are coconstructed with social constructs and what this means for reinforcing and challenging the narratives of mathematics education.

When reviewing NCTM’s (2014) Access and Equity Principle, I observed little mention about the coconstructed nature of mathematical concepts. I did come across a recommendation for effective mathematics teachers to “draw on community resources to understand how they can use contexts, culture, conditions, and language to support mathematics teaching and learning” (p. 65). Although this recommendation addressed culture, further guidance as to the ways mathematics teachers might do so with consideration in terms of race, gender, and socioeconomic status were vaguely described. Similarly, NCTM suggested “recognizing that mathematics programs that have served some groups of students, in effect privileging some students over others, must be critically examined and enhanced” (p. 60). This statement, although vague again, acknowledged that social constructs have and still do impact messages related to the teaching of school mathematics. However, the consideration of the social constructs stopped at the mathematics program level and did not trickle down into the mathematics that was discussed within the classroom setting.

In SCALE’s (2016a) *edTPA Secondary Mathematics Assessment Handbook*, prospective teachers are asked to reflect on what they know about “students’ everyday experiences, cultural and language backgrounds and practices, and interests” (p. 11). However, what is missing is an
emphasis to address the coconstruction of such issues in school mathematics as well. As teacher educators work with prospective teachers to prepare for the edTPA, I want to know how social constructs such as race, gender, and socioeconomic status are woven into the curriculum’s content and if teacher educators foresee this as even a focus of the edTPA. My engagement with my participants helps me further explore this inquiry.

As per the other category in “the what” of the WWH framework, mathematics can be used to understand and critique the world in a sociopolitical context (Felton, 2010b). Felton-Koestler (2017) defined the following four messages pertaining to mathematics as a role of social analysis:

1. **Distinct discipline**: Mathematics is a relatively self-contained discipline that has little to do with the “real world,” “everyday life,” or broader social and political concerns.

2. **Real world**: Mathematics should be connected to “real-world” topics that are viewed or positioned as largely “neutral” or “apolitical” in nature.

3. **Sociopolitical issues**: Mathematics should be connected to topics that are viewed as overtly political or controversial in nature.

4. **Injustice**: Mathematics should be connected to topics that are viewed or positioned as focusing explicitly on raising awareness about, understanding the origins of, and/or working to change perceived injustices. (p. 60)

In general, Felton-Koestler (2017) used social analysis to describe the relationship between mathematics and the understanding of world issues. On the one hand, mathematics could be viewed as self-contained and neutral in nature. On the other hand, mathematics could be used to address topics relative to everyday phenomenon, political issues, and structures perpetuating
social inequities. If mathematics was used in the latter example, mathematics could serve as an analytical tool to encourage critique, raise awareness, and advocate for change.

NCTM’s (2014) Access and Equity Principle suggested mathematics be connected to real-world topics. This idea was relayed in NCTM’s request for students to possess the “ability to use mathematics in authentic contexts” (p. 60). Additionally, NCTM encouraged district and school policies to be “reviewed to ensure that systemic practices [were] not disadvantaging particular groups or subgroups of students on the basis of societal stereotypes” (p. 69). In this address, NCTM acknowledged the need for critical discussion around students’ mathematical identities and how they were impacted by misconstrued assumptions. However, such discussions of injustices remained at the program evaluation level and did not transmit to the mathematics being taught in the classroom. Thus, NCTM did not mention mathematics as an analytical tool to address political and controversial topics, which suggested that NCTM did not recognize mathematics for its connection to sociopolitical and social justice issues. As a result, there existed little discussion about how mathematics could self-empower students with the skills and opportunities to advocate for change.

On the contrary, SCALE’s (2016a) edTPA Secondary Mathematics Assessment Handbook addressed mathematics as a distinct discipline, for concern in standards and learning objectives were always at the forefront. For example, prospective teachers were asked to describe the “standards and learning objectives” (p. 10) and “how s/he will use learning tasks and materials to lead students to make clear and consistent connections” (p. 14) when planning for students’ conceptual understanding, procedural fluency, and mathematical reasoning and/or problem-solving skills. The handbook’s Context for Learning template could invite prospective teachers to think about mathematics being addressed from perspectives of sociopolitical, real-
world, and injustice issues. A closer look at how teacher educators respond to NCTM and edTPA’s messages in their preparation of prospective mathematics teachers can bring awareness to how one influences or hinders the other’s message.

**The who.** When school mathematics is presented to students, we must consider whose perspective lies behind what is being taught. Additionally, we must question how this perspective relates to the learners. Felton-Koestler (2017) categorized mathematics into two distinct categories, mathematics as universal and mathematics as personal. Mathematics as universal views mathematics as independent from personal culture, interests, and identity. Therefore, no matter where mathematics is taught, learners can relate to the content. The latter, mathematics as personal, recognizes the individualistic nature of learning mathematics, for learners are exposed to a range of experiences that reflects student identity (e.g., culture, gender, race, socioeconomic status).

NCTM’s (2014) Access and Equity Principle communicated the importance for school mathematics to be taught with each and every learner in mind. For example, NCTM recommended that effective mathematics programs be “responsive to students’ backgrounds, experiences and knowledge” (p. 60). When engaging with the mathematics, teachers should ensure students have personal connections with the content. Additionally, mathematics teaching should be framed within a “growth mindset, acknowledging student contributions, and attending to culture and language play” (p. 65).

When describing equity, NCTM cited their previously published *Principles and Standards* (2000) to clarify that educators should differentiate based on reasonable and appropriate accommodations for the sake of all students. Similarly, a statement was made about how “effective mathematics instruction leverages students’ culture, conditions, and language to
support and enhance mathematics learning” (NCTM, 2014, p. 63). These messages of encouraging individualized support and incorporating students’ culture acknowledge mathematics as personal.

In the edTPA Secondary Mathematics Assessment Handbook, prospective teachers were encouraged to “develop and apply knowledge of varied students’ needs…[and] consider research and theory about how students learn” (SCALE, 2016a, p. 1) as they designed, implemented, and assessed students’ understandings of mathematics. Additionally, prospective teachers were asked to describe how their “instruction linked students’ prior academic learning and personal, cultural, and/or community assets with new learning” (p. 21). Thus, the edTPA Secondary Mathematics Assessment Handbook insinuated the perspective of mathematics as personal. Given that the edTPA and NCTM communicated similar messages about learners’ identities influencing the mathematics learned in the classroom, my research further explores how teacher educators respond to such messages when preparing prospective mathematics teachers.

**The how.** Felton-Koestler (2017) described the how of mathematics as the relationship between mathematical concepts and the real-world. If there exists a focus on mathematical concepts, a primary concern is placed on learning specific mathematical concepts that can later be connected to real-world applications to bridge a greater understanding. Here, concern lies in making sure world connections do not interfere with learning the content. On the contrary, a focus on the real-world acknowledges the existence of phenomena in the world where mathematical concepts can then be used to better understand the phenomena.

Throughout NCTM’s (2014) Access and Equity Principle, the how of mathematics was described with a focus on mathematical concepts. Once students had a solid understanding of the mathematical skills, mathematics programs were encouraged to “use mathematics in authentic
contexts” (p. 60). The achievement outcomes stressed student performance on mathematics assessments and the use of mathematics in applications. Thus, a phenomenon in the world did not drive the need to learn mathematical concepts to further understand a specific phenomenon.

Similarly, the instruction task of SCALE’s (2016a) edTPA Secondary Mathematics Assessment Handbook examined the content of pedagogy with a focus on mathematical concepts. Emphasis was placed on creating learning objectives derived from content standards. For example, lesson plans were required to include “state-adopted student academic content standards that [were] the target of student learning” (p. 9). Attention was brought to the importance of making connections, but the extent to which students made connections was between conceptual understanding, procedural fluency, and mathematical reasoning and/or problem-solving skills. For example, the planning commentary instructed prospective teachers to “help students make connections between concepts, computations/procedures, and mathematical reasoning or problem-solving strategies to build understanding of mathematics” (p. 10). Few connections were made to relate mathematics content to real-world applications.

In summary, Felton-Koestler’s (2017) WWH framework provides a lens to explore what mathematics teacher educators communicate about school mathematics through teacher performance assessments and professional mathematics education organizations’ reform initiatives. A brief look at NCTM’s (2014) Access and Equity Principle and SCALE’s (2016a) edTPA Secondary Mathematics Assessment Handbook through Felton-Koestler’s (2017) WWH framework illuminates what is (or not) being communicated both socially and politically about mathematics. As previously suggested, a future endeavor of mine is to extend this research in depth and breadth. For example, a look at AMTE’s Equity in Mathematics Teacher Education (2015) position paper and Standards for Preparing Teachers of Mathematics (2017) can
showcase the evolving focus to address sociopolitical concerns in association with access and equity. As for my current work, I use Felton-Koestler’s (2017) WWH framework as one component of my lens, the other component being Gutiérrez’s (2007a) equity framework, to assist with conceptualizing secondary mathematics teacher educators’ responses and experiences navigating reform initiatives in a sociopolitical context.

**Gutiérrez’s Equity Framework**

While Felton-Koestler’s (2017) WWH framework provides a series of questions to understand mathematics (and mathematics education) as a social and political activity, I turn to Gutiérrez’s (2007a) equity framework to further explore my participants’ responses to preparing prospective secondary mathematics teachers to understand the social contexts of mathematics teaching and learning. As my participants describe equity and equitable teaching practices, they reference concepts of access, achievement, identity, and power. Each concept (or dimension) is used to define equity in Gutiérrez’s equity framework. Next, I describe each dimension and how the framework organizes the dimensions on two axes (i.e., the dominant axis and the critical axis). I also address how the framework is used to synthesize my work.

Gutiérrez (2007a) defined equity as fairness, a concept not to be confused with sameness. Within the mathematics classroom, equity can be misconstrued as equality, where all students receive access to the same resources with goals to achieve at the same level. However, concepts of *access* and *achievement* represent just one axis that Gutiérrez identified as the dominant axis. When considering equity in terms of justice, students have opportunities to see themselves in the mathematics curriculum and be self-empowered to use mathematics as an analytical tool to critique the world. Gutiérrez placed concepts of *identity* and *power* on another axis that she identified as the critical axis. For me to adequately describe each axis and explain how both axes
contribute to framing equity, I must elaborate on each dimension: access, achievement, identity, and power.

Access in the mathematics classroom refers to the “tangible resources that students have available to them to participate in mathematics” (Gutiérrez, 2007a, p. 2). This definition, for example, encompasses students having accessibility to high quality teachers, rigorous curriculum, inviting classroom environments, appropriate technology, and adequate texts and supplies. Although students may have access to equal resources, they may be equipped with resources that insufficiently address their specific mathematical, cultural, and linguistic needs. Not only is access then limiting but also it perpetuates sameness and ignores past injustices (Gutiérrez, 2007b). Thus, access must be considered as one dimension among others when addressing equity.

Another dimension is that of achievement, which Gutiérrez (2007b) described as student outcomes that measure students’ ability (e.g., course grades, course-taking patterns, standardized exams) and “confer power on individuals” (p. 42). When achievement is considered in terms of scores, where structures have routinely stacked the odds against marginalized students, students’ acceptance into higher education and STEM-based fields can be impacted (Gutiérrez, 2007a). This “standardization” of achievement can be further described in Gutiérrez’s (2008) work where she problematized research addressing the “achievement gap.”

Gutiérrez (2007b) also described how the five strands of proficiency (i.e., adaptive reasoning, conceptual understanding, procedural fluency, productive disposition, and strategic competence) developed by the Mathematics Learning Study Committee (National Research Council, 2001) can be viewed as another measure of achievement. In fact, Gutiérrez (2002) addressed the strands of proficiency in previous work as “the mastery of dominant mathematics
in that it tends to reflect critical thinking within the confines of the given mathematics in society, not on broader issues” (p. 155). Similarly, SCALE’s (2016a) edTPA Secondary Mathematics Assessment Handbook interweaves comparable focus strands (i.e., conceptual understanding, mathematical reasoning and problem-solving skills, precise communication skills, and procedural fluency) throughout its prompts and rubrics.

The identity dimension recognizes the need for students to have opportunities to self-identify with the mathematics taught by drawing on their own experiences and cultural and linguistic resources (Gutiérrez, 2009b). Furthermore, the dimension addresses the balance needed between students’ understandings of themselves as well as others, which can be described in terms of a mirror/window metaphor (Gutiérrez, 2007a). Establishing different frames of reference with the aid of mathematics can assist students with seeing (and appreciating) their own reflection as well as those around them in the world. Additionally, Gutiérrez (2009b) suggested that the dimension illuminates ways students have been (and still are) racialized, gendered, and classed. Thus, identity can be used to draw attention to students’ pasts and embrace their present mathematical, cultural, and linguistic assets.

The fourth dimension of Gutiérrez’s (2007a) equity framework acknowledges power. Gutiérrez described the ways power can be measured in terms of “voice in the classroom,” “opportunities for students to use math as an analytical tool to critique society,” “alternative notions of knowledge,” and “rethinking the field of mathematics as a more humanistic enterprise” (p. 4). Thus, a look at power can assist with examining who is privileged (and silenced) in the classroom and in what ways mathematics can be used to explore (and critique) problems relative to students’ communities.
Gutiérrez (2007a) placed the four dimensions on two axes (i.e., the dominant axis and the critical axis). Both access and achievement appear on the dominant axis, with access viewed as the “precursor” to achievement (Gutiérrez, 2007a). Gutiérrez (2002) described dominant mathematics as—

Mathematics that reflects the status quo in society, that gets valued in high-stakes testing and credentialing, that privileges a static formalism in mathematics, and that is involved in making sense of a world that favors the views and perspectives of a relatively elite group. (pp. 150–151)

Thus, the dominant axis acknowledges that students must be prepared to master the dominant mathematics if they are to participate in society. Knowledge of the dominant mathematics can then be used to critique society’s status quo; however, another axis can provide the frame of reference to do so.

The critical axis is comprised of the identity and power dimensions, with identity viewed as the “precursor” to power (Gutiérrez, 2007a). Gutiérrez (2002) described critical mathematics as—

Mathematics that squarely acknowledges students are members of a society rife with issues of power and domination. It takes students’ cultural identities and builds mathematics around them in ways that doing mathematics necessarily takes up social and political issues in society, especially highlighting the perspectives of marginalized groups. This is the mathematics that challenges static notions of formal mathematics, as embedded in a tradition that favors the West. (p. 151)

Here, identity can be used to give students the power to understand themselves as advocates for themselves and others. Knowledge of the critical mathematics can assist students with
developing advocacy and the skills to be critical. Given that “mathematics is a human practice that reflects the agendas, priorities, and framings that participants bring to it” (Gutiérrez, 2007a, p. 4), students who identify with the mathematics as a social and political activity can use that understanding to acquire entry in dominant mathematics. Thus, the two axes comprised of the four dimensions must be carefully considered when defining equity.

Gutiérrez’s (2007a) equity framework provides a lens for me to conceptualize my participants’ understanding of equity and how this transmits to preparing prospective secondary mathematics teachers for the social contexts of mathematics teaching and learning. I use both axes as a reference to frame what is (or not) shared by my participants, and what this communicates about the ways teacher educators are addressing concepts of access, achievement, identity, and power in mathematics education. Furthermore, I explore Gutiérrez’s (2009b) dominant axis as a frame to “measure how well students can play the game called mathematics” (p. 6) and the critical axis as a frame to “change the game” (p. 6) in relation to responding to reform initiatives. I make this reference given that teachers (and teacher educators) must be advocates for students (and prospective teachers) as they learn to “play the game” and “change the game.”

**Mathematics Education as Political?**

So why use a sociopolitical lens in mathematics education and, most importantly, my research? As previously discussed, mathematics is a human practice exhibiting a political nature (Gutiérrez, 2007a, 2009a). Therefore, mathematics education (and education in general) should be studied for its political aspects as well as its social aspects. Shor and Freire (1987) asserted—

This is a great discovery, education is politics! After that, when a teacher discovers that he or she is a politician, too, the teacher has to ask, What kind of politics am I doing in
the classroom? That is, In favor of whom am I being a teacher? By asking in favor of whom am I educating, the teacher must also ask against whom am I educating. Of course, the teacher who asks in favor of whom I am educating and against whom, must also be teaching in favor of something and against something. This “something” is just the political project, the political profile of society, the political “dream.” (p. 46)

Framing my research with a sociopolitical lens allows me to uncover the unwritten rules that privilege some individuals over others in an era of reform in mathematics education. A sociopolitical lens also does the same for me as a researcher:

A socio-political perspective in mathematics education does not only offer possible theoretical tools and interpretations, but also emphasises the researcher’s awareness of the research process and on how he/she privileges—and silences—diverse aspects of the research activity. (Valero & Zevenbergen, 2004, pp. 2–3)

Thus, this research contributes to the understanding of the social and political aspects of reform in mathematics teacher education by examining secondary mathematics teacher educators’ responses to the edTPA and professional organizations’ initiatives. A particular look at the political facet explores the role of power in reform and how gatekeeping perpetuates discourses that characterize who is successful in the teaching and learning of mathematics. Furthermore, an understanding of reform’s social and political messages reveals the way mathematics is learned and understood in society.
CHAPTER 4

METHODOLOGY

Conducting research requires a researcher to question the purpose of the work, the intimacy of the relationship between the researcher and the “object” of study, and what situational constraints shape the inquiry. When studying the socially constructed nature of reality, qualitative research may be preferred, for it uses an inductive process to build theory from rich descriptions of contextual observations, experiences, and understandings (Denzin & Lincoln, 2011). This chapter discusses my purpose for conducting research using qualitative case study methodology. This methodology affords me the opportunity to research how individuals, their experiences, and their natural surroundings contribute to real-world phenomenon. To frame my work, I reference two methodologists who have laid, in part, the foundation for work in this field, Robert Stake and Robert Yin. I address my subjectivity and positionality as well as the principles, procedures, and assumptions found in qualitative case study inquiry. I close the chapter situating my research participants in their respective contexts and sharing my journey of data collection and analysis.

Purpose for Qualitative Case Study Methodology

Qualitative case study methodology is used in fields such as anthropology, psychology, education, sociology, nursing, law, policy, business, political science, and occupational science and therapy (Hammersly & Gomm, 2000; Platt, 1992; Smith, Stephenson, & Gibson-Satterthwaite, 2013; Yin, 2014). Researchers who engage in this work conduct in-depth

19 I use “participants” and “informants” interchangeably to describe research subjects because they are the ones telling their stories. Informants bring their own unique perspective and experience as they participate in a study.
explorations of a phenomenon using a variety of data sources (Orum, Feagin, & Sjoberg, 1991). These data sources, such as interviews, document analyses, and observations, contribute to the researchers’ understandings of the multiple facets of the phenomenon.

A qualitative case study is appropriate for my research given that I investigate participants’ understandings of a contemporary phenomenon within its real-life situation where the boundaries between the phenomenon and the situation are not clear, which follows Yin’s (2014) definition of a case study. The holistic nature of a qualitative case study allows me to examine how people respond to social actions through teacher education reform initiatives. Gathering these accounts and explaining their complexities may not be accessible through experimental or survey research. Thus, qualitative case study methodology provides me with an opportunity to study human experiences and understandings within a context.

Before I can discuss any further about my selected choice of methodology, I must review how my theoretical perspective ties into qualitative case study methodology. As discussed in the previous chapter, my research emerges from a sociopolitical concern. Valero (2004) asserted that research conducted from this perspective considers the political, dialogical, and social nature of the phenomenon of study. Thus, engaging in qualitative case study research with a sociopolitical perspective affords me an opportunity to examine what secondary mathematics teacher educators communicate about the teaching and learning of mathematics. Reflection on my informants’ responses and experiences contributes to my understanding of how secondary mathematics teacher educators navigate the edTPA while simultaneously responding to professional mathematics education organizations’ reform efforts (e.g., AMTE, 2017; NCTM, 2000, 2014) that promote effective, inclusive, and socially just systems of education. Additionally, I am cognizant of how sociopolitical research cautions readers to be critical of “the research process,
the intentionality of the research, and the paths that the researcher decided to take when meeting
the people with whom she engaged in the research” (Valero, 2004, p. 19), more of which I
discuss throughout this chapter.

**Reflecting on My Subjectivity and Positionality**

Unveiling my subjectivity and positionality in conjunction with my rationale for choosing
qualitative case study methodology unmask, upfront, who I am as a researcher embarking on a
research journey. Being transparent with my subjectivity means revealing my life experiences
(i.e., the cultural, social, and political aspects) and how such experiences influence me as a
researcher, including my researcher biases, assumptions, interactions, and analyses. Peshkin
(1988) described subjectivity as inevitable, for it is “not a badge of honor…[but] a garment that
cannot be removed” (p. 17). Thus, researchers are responsible for identifying their subjectivities
and interweaving them throughout the research process from start to finish (Peshkin, 1982,
1988). By revealing my subjectivity, I unveil personal qualities that otherwise may have skewed
the results of the investigation if not disclosed. In the following, I share my subjectivity,
including my positionality, and reflect on how both shape my inquiry as well as influence the
findings of my investigation.

I describe myself as a young, White (one-fourth Japanese), middle-class, female educator
and doctoral student. With a Bachelor of Science in Education (Mathematics Education), four
years of teaching experience, and a Masters of Education (Mathematics Education), I decided to
pursue a Doctor of Philosophy in Teaching and Learning in Mathematics Education at Georgia
State University. I attribute my academic success to my upbringing in a household that valued
education. Even though I was the first to receive an undergraduate degree on my father’s side
and a graduate degree on my mother’s side, education represented the path to follow my
occupational goals and become an educated citizen. Thus, I have always been interested in studying the field of education, more specifically mathematics education.

As a mathematics teacher at a Title I STEM-accredited magnet school just outside of Atlanta, Georgia, I developed curriculum, activities, and assessments for Coordinate Algebra, Analytic Geometry, and Advanced Algebra and Trigonometry. While planning with the Common Core State Standards, I referenced NCTM’s (2000) *Principles and Standards* and other documents. My membership in NCTM and my experience working with their standards throughout my undergraduate and graduate degrees as well as my teaching position provided me with a context to know about NCTM’s contributions to the field of mathematics education.

In the summer of 2015, as a doctoral student at Georgia State University, I was introduced to the edTPA while collaborating with a secondary mathematics teacher educator, who also served as the program coordinator for the Master of Arts in Teaching Secondary Mathematics. We co-taught two introductory methods courses to prospective secondary mathematics teachers enrolled in the initial teacher preparation program. Given that the prospective teachers joined the program at the start of edTPA’s initiative in Georgia, they were required to submit the edTPA for program completion. They also had to pass the assessment to receive their teaching license for the state. Thus, my co-instructor and I made sure to acquaint ourselves with SCALE’s (2016a) *edTPA Secondary Mathematics Assessment Handbook* and other supplemental materials, such as *Making Good Choices: A Support Guide for edTPA Candidates* (SCALE, 2016b), *Understanding Academic Language in edTPA: Supporting Learning and Language Development* (SCALE, 2016c), and *Understanding Rubric Level Progressions: Secondary Mathematics edTPA* (SCALE, 2016d). We also strategically integrated the assessment’s commentary prompts and expectations into the program curricula. Thus, my
experience working alongside my co-instructor raised my awareness of teacher educators’ efforts preparing prospective teachers for success in both teacher education and the edTPA.

My additional experiences working as a university supervisor and a graduate research assistant for the Dean’s Office enabled me to closely work with prospective teachers as they prepared for the edTPA during their clinical field experiences. As I provided aid with the technical and logistical aspects of the edTPA, I witnessed various ways prospective teachers, teacher educators, university supervisors, and mentor teachers responded and interacted with the edTPA. Although I heard stories depicting both disdain and gratitude toward the edTPA, I viewed the edTPA as one additional requirement set forth by reform initiatives to reconceptualize and standardize teacher preparation.

I continue to view the edTPA as one of the many hurdles to obtaining a teaching license. I agree that prospective teachers must be equipped with the knowledge and skills to engage in effective teaching practices. Methods courses and clinical field experiences must be demanding and challenging to ensure prospective teachers are ready for the classroom. However, I am not confident in the validity of a high-stakes performance assessment being a measure of one’s readiness to teach, especially when the structure of the assessment may be more achievable to some than others (e.g., English-language learners, marginalized students). Thus, I acknowledge my open-minded yet cautious perspective of the edTPA as I engage with my participants. Additionally, I recognize that while I have limited experiences teaching prospective secondary mathematics teachers within the confines of one university, I am mindful that the experiences I do have with the edTPA still contribute to my subjectivity.

As a researcher, I must also consider how my positionality affects my interactions and relationships with my participants, including how they view me as a researcher. To view myself
as objective and detached from my participants would be next to impossible. A researcher conducts research because of a certain level of interest and curiosity that generates the need for the researcher to pursue the inquiry (Jones, 2001). To establish a relationship with my participants, I must recognize how others will view my role as a researcher entering their world of teaching practices and experiences. This insider and/or outsider perspective, with respect to the context and culture being studied, is crucial to align with my identity.

As described by Holmes (2014), an insider perspective, also known as an emic account, situates the researcher within the culture of the participants. This description means that one’s context of behavior, action, and construction of meaning is relative to whom they are interacting with and observing. On the contrary, an outsider perspective, also known as an etic account, places the researcher’s culture on the outskirts of the participants’ culture. Thus, I must identify my perspective in relation to my participants to establish the limitations of my research. If I embrace my position as an insider, I have a chance to obtain access to my participants’ experiences and responses and better understand their unique world (Jones, 2001). Therefore, how I appear to interact with the participants determines the quality and quantity of the data I collect.

My experience working with the edTPA and reviewing AMTE and NCTM’s standards helped me to relate to the secondary mathematics teacher educators that I interviewed. This insider perspective provided me with an emic account that allowed for opportunities with teacher educators to construct conversations that revealed their responses toward teacher performance assessments and ideas of access and equity. Additionally, I sympathized with teacher educators’ concerns. By being able to relate to teacher educators’ experiences, I also understood how such experiences influenced the construction of one’s meaning. Although my insider perspective
provided me with an opportunity to be a sounding board for teacher educators sharing their experiences and responses, I also recognized that such research may be perceived as biased and narrowly defined.

Thus, I made plans to manage my subjectivity and positionality by engaging in continual reflection throughout my research process. I documented my researcher reflexivity in audio and written diaries. The diaries enabled me to reflect on my thoughts, biases, and experiences collecting and analyzing data. Through reflection, I could “tame [my] subjectivity” as not to have “untamed subjectivity [mute] the emic voice” (Peshkin, 1988, pp. 20–21). Additionally, the diaries aided in leaving a subjectivity audit trail and assisting with my transparency as a researcher, more of which I comment on in the qualitative “reliability” section.

**Philosophical Underpinnings of Stake and Yin**

A researcher’s philosophical underpinnings can describe how one views reality, acquires knowledge, deals with values, and engages in inquiry. Stake (1994, 1995, 2005) and Yin (2014) were forthcoming, for the most part, with how their philosophical stances impacted their assumptions in viewing case study research. In the following section, I identify the ontological, the epistemological, and the methodological assumptions of Stake and Yin.

A look at the ontological assumptions of Stake and Yin can provide insight into how each viewed the nature of reality, or “the study of being” (Crotty, 1998, p. 10). Stake (1994, 1995, 2005) situated his work from a constructivist paradigm. As described by Guba and Lincoln (1994), a constructivist paradigm views reality as relativist, which is comprised of multiple realities that are socially constructed and holistic in nature. These realities are continuously changing and, as a result, cannot be predicted or controlled, which makes studying causal linkages—cause-and-effect relationships—impossible. In fact, Stake (1995) described how “the
real business of case study is particularization, not generalization” (p. 8). This particularization also means that for one to understand a phenomenon, one must consider the context in which it occurs.

On the other hand, Yin (2014) oriented most of his work “toward a realist perspective, which assumes the existence of a single reality that is independent of any observer” (p. 17). This realist perspective aligns with a positivist (or post-positivist) paradigm that views reality as truth while also being objective, predictable, and controllable in nature. Thus, “time- and context-free generalizations” can take the form of causal explanations, which can be used to direct research and explain findings (Guba & Lincoln, 1994, p. 109).

Although Yin (2014) situated case study methodology from a realist perspective, he also recognized that a relativist perspective could be taken. Yin cautioned that a relativist perspective will impact the way researchers capture participants’ different perspectives and present their findings. Thus, Yin acknowledged the “applicability of different epistemological orientations” (p. 17) but mainly positioned himself within a realist perspective.

The epistemological assumptions of Stake and Yin revealed insight in how knowledge was acquired. From Stake’s constructivist paradigm, knowledge was created in the interaction between the researchers and the informants (Guba & Lincoln, 1994). As described by Stake (1994, 1995, 2005), researchers were encouraged to interact with their informants in day-to-day activities, oftentimes over an extended period of time. Thus, knowledge required a transactional and subjectivist approach that was constructed through interactive experiences (Guba & Lincoln, 1994). Findings gathered were specific to the time and context of the participating informants and could not be generalized beyond the scope of the study. Therefore, the knowledge gained acted as “working hypotheses” and reflected the subjectivity of the researcher.
From Yin’s perspective that aligned with the “positivist tradition” (Yazan, 2015, p. 137), the researcher and the investigated “object” were independent entities (Guba & Lincoln, 1994). In a positivist paradigm, knowledge was acquired through a one-way interaction. To reduce the threat to validity, the researcher refrained from influencing or being influenced by the informants. To aid in this endeavor, researchers would follow prescribed procedures. As suggested by Yin (2014), researchers were encouraged to involve multiple observers when conducting an observation to increase the reliability of observational evidence. Also, researchers were urged to treat interviews as “verbal reports only” (p. 113) to reduce biases and collect data from multiple sources as a means of corroborating the findings.

How Stake and Yin approached their methodological assumptions were quite different as well. A look at how each defined case study provided insight into such assumptions. Stake (1995) described a case study as “a study of the particularity and complexity of a single case, coming to understand its activity within important circumstances” (p. xi). Thus, case studies drew from “naturalistic, holistic, ethnographic, phenomenological, and biographic research methods” (p. xi). A further look at the research methods revealed their flexible and inductive nature. A flexible conceptual framework could be used, but it was not required. Throughout the research project, modifications could be made, including changes to the research questions. The resulting interpretations gathered from the research would guide the understanding of a phenomenon that occurred in a particular context.

On the contrary, Yin (2014) defined case study with two considerations in mind, its scope and features. In the first part, case study was compared to an “empirical inquiry” that “investigate[d] a contemporary phenomenon in depth and within its real-life context” where “the boundaries between phenomenon and context [were] not clearly evident” (p. 16). In the latter, he
described what he termed “methodological characteristics” of case study inquiry, such as coping with “more variables of interest than data points;” retrieving data from “multiple sources of evidence, with data needing to converge in a triangulating fashion;” and using the “prior development of theoretical propositions to guide collection and analysis” (p. 17). Thus, Yin’s definition of a case study addressed the design, data collection techniques, and the data analysis methods.

Yin (2014) used structured research methods to legitimize the process of inquiry. He used theories to generate propositions, which identify the relationships among the constructs and direct the data collection and the analysis. Here, the researcher relies on the propositions to control for confounding conditions that might derail the study from its intended purpose (Guba & Lincoln, 1994). If propositions are not used (i.e., the case of an exploration case study), a stated purpose with established criteria—to judge whether the study is successful—should be addressed. Thus, Yin (2014) suggested that the research design consist of structures aimed at “defining the logic linking the data to the propositions and the criteria for interpreting the findings” (p. 36).

When I reflect on Stake and Yin’s philosophical assumptions, I align more with Stake’s perspective. Although I understand the value of structure and using previous literature to guide my work, research on my informants, in the particular context of study, opens the door for exploration and new understandings. Having a rigid conceptual framework that focuses my study into proving or disproving propositions not only limits the richness of the collected data but also stifles the possibility of uncovering unknown elements of the phenomenon. Thus, my research is not constrained by propositions but is instead open to flexibility. Additionally, I interact with secondary mathematics teacher educators as they share their experiences working to prepare
prospective secondary mathematics teachers for the Secondary Mathematics edTPA while also navigating professional mathematics education organizations’ reform initiatives. Each secondary mathematics teacher educator has a unique experience of which I come to (attempt to) understand through our interactions. Next, I present Stake and Yin’s approach to defining and selecting a case as well as how I do the same with my research.

**Defining and Selecting a Case**

Stake (1995) defined a case as “a specific, a complex, functioning thing” like “an integrated system…[that]…has a boundary and working parts” (p. 2). A case may focus on a particular person, group, organization, program, community, or multiple groups who share common experiences. Although events and processes can be included, Stake indicated that case study research does not benefit from these, which is contrary to Yin’s (2014) belief that cases can be used for evaluation purposes. Yin asserted that researchers “define a specific, real-life ‘case’ to be a concrete manifestation of the abstraction” (p. 34). He also referred to a case as a unit of analysis, which plays a role in determining the research questions and the propositions.

When selecting a case, a researcher should consider the nature of the case, such as the physical setting, the historical background, the informants represented in the case, and other contexts (i.e., aesthetic, economic, and political attributes; Stake, 1994). A case is not studied to understand other cases; thus, “case study research is not sampling research” (Stake, 1995, p. 4). When a case is selected, an identification of its bounds must be made (Stake, 1994, 1995; Yin, 2014). Boundaries identify what will and will not be examined in the study. More specifically, a bound considers time, location, and activity (Stake, 1995).

I describe my case as nine secondary mathematics teacher educators in the state of Georgia. These teacher educators currently work with prospective secondary mathematics
teachers—seeking certification in grades 6 through 12—and identify as methods course instructors and/or program coordinators at nine public and private institutions of higher education with accredited teacher preparation programs in Georgia. The secondary mathematics teacher educators identify as knowledgeable (to some extent) of the reform efforts of professional organizations (i.e., AMTE and NCTM) in mathematics education. They are also involved in preparing prospective secondary mathematics teachers for the Secondary Mathematics edTPA, which is a state requirement to receive teacher certification (GaPSC Rule 505-2-.26 Certification and Licensure Assessments, 2016).

**Case Study Type and Design**

Yin and Stake describe case study types and designs using differing terminology despite some similarities. How researchers classify their cases can elicit design variations and influence the research questions. In the following section, I discuss Yin and Stake’s classifications of case study types and designs. I then classify my research as per the described types and designs and address my rationale.

Yin (2014) identified a case study as one of three classifications (i.e., exploratory, descriptive, and explanatory). An exploratory case can be used to explore a phenomenon of interest with no clear outcomes. Research questions in an exploratory case can ask about the “what” and the “how many” to “develop pertinent hypotheses and propositions for further inquiry” (p. 10). In a descriptive case study, a phenomenon can be described in the real-life context in which it occurs. The researcher should have descriptive theory prior to the start of the study. The descriptive theory would then be used to support the description of the phenomenon under study. As for the last classification, the explanatory case can be used to explain presumed
causal links in real-world interventions. Research questions in an explanatory case consider the “how” and the “why.”

When determining what type of case study is applicable to a research inquiry, the design of the study must also be considered. Yin (2014) described the designs as single or multiple-case studies. Single cases can be used to represent one test of a significant theory. They could reflect an everyday situation or represent something unusual or extreme. Furthermore, single cases could consist of embedded units of analysis or reflect a holistic nature. If more than one case is of interest, a multiple-case could be used. In a multiple-case study design, researchers can explore differences within and across cases. From Yin’s perspective, the goal of multiple-case studies is to replicate findings. Although multiple-case studies can exhibit robust data, they can be time consuming, two key factors to think about when determining the design of the study.

Stake (1994, 1995, 2005) categorized cases studies into three types, which include the intrinsic, the instrumental, and the collective. In an intrinsic case study, researchers have a genuine interest in a particular case. They are interested in understanding a unique situation rather than building theory or looking at a phenomenon. For example, researchers might study a child or a university. Thus, the study’s findings have limited transferability.

An instrumental case study can be used to conduct an in-depth examination of an issue while also contributing to theory. Here the case is of secondary interest, for the main purpose is to understand a particular situation or phenomenon. As described by Stake (2005), “the case still is looked at in depth, its contexts scrutinized and its ordinary activities detailed, but all because this helps us pursue the external interest” (p. 445). Researchers should examine “various interests in the phenomenon, selecting a case of some typicality, but leaning toward those cases that seem to offer opportunity to learn” (Stake, 1994, p. 243).
The last type is a collective case, which is similar to Yin’s multiple case studies in that it incorporates different sources to study an issue or phenomenon. Basically, a collective case is “not the study of a collective but instrumental study extended to several cases” (Stake, 1994, p. 237). The cases may be similar, even redundant to one another. They could also be dissimilar and exhibit variety. The sampling attributes should not dictate the selection of the cases, for Stake recommended balance, variety, and most importantly, the opportunity to learn. However, when considering a minimum number of cases, Stake (2006) recommended that four cases be used for a collective case study. Nevertheless, the number of cases may be selected because they will “lead to better understanding, perhaps better theorizing, about a still larger collection of cases” (Stake, 1994, p. 237).

I classify my research as a descriptive, instrumental case study, where the primary purpose of the study is to understand a phenomenon in real-world contexts. My phenomenon of interest is reform in mathematics education and the responses secondary mathematics teacher educators have toward the edTPA and professional organizations’ (i.e., AMTE and NCTM) initiatives. As previously discussed, I identify the bound of my case as the state of Georgia. Given that states adopt varying policies regarding the edTPA (e.g., passing scores, program completion, teaching licensure), focusing my study to one state situates the phenomenon in a specific context.

With the state of Georgia mandating the edTPA as a high-stakes initiative, the selection of this state provides a critical, single-case from which to examine the ways secondary mathematics teacher educators respond to the assessment while also navigating professional organizations’ initiatives. As described by Yin (2014), a single-case design can offer a “critical test of a significant theory” that can contribute further knowledge that affirms, challenges, or
extends the theory (p. 51). Although I recognize my study as a single-case design, I acknowledge that secondary mathematics teacher educators from institutions of various contexts (e.g., affiliation, demographics, setting, size) may respond differently amongst themselves.

Thus, I further describe the single-case as one with embedded cases (see Figure 2). I identify the first embedded case as secondary mathematics teacher educators from large public institutions of higher education in Georgia with an enrollment of 20,000 or more students. The second embedded case looks at secondary mathematics teacher educators from medium-sized public institutions of higher education in Georgia with approximately 10,000 students, while the third embedded case focuses on small private institutions with approximately 2,000 to 5,000 students. The last embedded case highlights secondary mathematics teacher educators from Historically Black Colleges and Universities (HBCUs) in Georgia. The four embedded cases, my units of analysis, recognize that secondary mathematics teacher educators’ responses can be influenced (to some extent) by their context, which is noted as the type of institution. Examining the various contexts in which secondary mathematics teacher educators’ share their experiences can assist in further describing the phenomenon of interest. Thus, the subunits add detail and complexity to the design of the study.

**Single-Case:**
Secondary Mathematics Teacher Educators in Georgia

**Embedded Units of Analysis:**
- Large Public Institutions (20,000+ students)
- Medium Public Institutions (approx. 10,000 students)
- Small Private Institutions (approx. 2,000-5,000 students)
- Historically Black Colleges and Universities

*Figure 2: Model Case Study Design.* An illustration of my embedded, single-case design.
Yin (2014) encouraged identifying subunits in single-case study designs, if appropriate, to “add significant opportunities for extensive analysis, enhancing the insights into the single case” (p. 56). However, I am reminded that I must not focus all of my attention on the subunits as I am primarily interested in the holistic aspects of the case. Thus, the embedded, single-case study design serves to organize my findings and provide clarity to my understanding of the phenomenon.

**Developing Research Questions**

Research questions guide the scope of the study; thus, special attention to the development of the research questions is vital for establishing a rationale for the inquiry. In the following section, I discuss the recommendations of Stake and Yin to researchers seeking inspiration and assistance when developing research questions. I apply the suggestions to my own work and present the three research questions I used to guide my inquiry.

As researchers solidify their research inquiries, Stake and Yin provide different recommendations to assist researchers with developing their research questions. On the one hand, Yin (2014) recommended that researchers identify propositions to generate potential questions. On the other hand, Stake (1995) suggested reflecting on topical questions—questions that rely on information to describe the interested cases—and issue statements—statements based on literature, observations, and concerns. Nevertheless, Stake (1995) cautioned that issue statements are complex in nature given that “issues are not simple and clean, but intricately wired to political, social, historical, and especially personal contexts” (p. 17). Thus, issue statements coupled with theory can appropriately guide the questions being asked. Using Stake’s suggestions, I used a combination of questions and statements derived from literature and observations as an instructor, aid, and university supervisor working with the edTPA and
professional organizations’ initiatives (e.g., AMTE, 2017; NCTM, 2000, 2014) to develop my research questions.

Additionally, a researcher must also consider appropriate question types for case study research. As described by Yin (2014), case study questions often take the form of “how” and “why” queries. Both questions can provide descriptive insight as well as assist with explanatory research that examines operational links over a period of time. However, “what” questions can also be of interest in case study research, especially when the study is exploratory in nature. Given that my case study is identified as descriptive and instrumental, I frame my research questions with “how” and “what.”

Within a sociopolitical perspective, my case study of nine secondary mathematics teacher educators in Georgia examines the following research questions:

1. How do secondary mathematics teacher educators respond to the edTPA as a state-mandated initiative to reform teacher assessment and readiness for the classroom?

2. What are secondary mathematics teacher educators’ experiences using the Secondary Mathematics edTPA and professional mathematics education organizations’ initiatives to prepare, instruct, and assess prospective secondary mathematics teachers?

3. How do secondary mathematics teacher educators develop prospective secondary mathematics teachers’ understandings of the social contexts of mathematics teaching and learning while navigating reform in mathematics education?

These research questions guide the nature of my work, including the selection of my participants and the study’s data collection, management, and analysis.
Research Settings and Participants

My research participants are described as nine secondary mathematics teacher educators from nine public and private institutions of higher education with accredited teacher preparation programs in the state of Georgia. More specifically, all participants worked with prospective secondary mathematics teachers—seeking certification in grades 6 through 12—as methods course instructors and/or program coordinators at their respective institutions. Each participant self-identified as being knowledgeable (to some extent) of the reform efforts of professional organizations (i.e., AMTE and NCTM) in mathematics education. Additionally, each participant confirmed his or her active role in preparing prospective secondary mathematics teachers for the Secondary Mathematics edTPA. Some participants had experience preparing prospective teachers across varied academic disciplines and working with other edTPA handbooks. Such experiences did not eliminate the participants as potential recruits; however, given the focus of the study, I only inquired about secondary mathematics experiences. In the following section, I identify the participants with their associated institutions of higher education. To respect anonymity and confidentiality, I used a pseudonym for each participant and separated potential identifying demographics and experiences from the pseudonym.20

The study examines nine participants from nine institutions of higher education located in various locations throughout the state of Georgia. The nine institutions are among some of

20 I decided to address the participants’ demographics and experiences separate from the descriptions of the institutions of higher education given that the community of mathematics teacher educators in the state of Georgia can be relatively small and close-knit. Unveiling personal identifiers associated with the institutions can expose the participants, especially when there may exist only one faculty member with such a role at an institution. Although I recognize that demographics and experiences could influence the participants’ responses and, thereby, add to the findings, the risk of revealing participants is a debate of ethical concern. I would rather take extreme caution and present the participants’ demographics and experiences in a holistic manner (see Table 4).
Georgia’s leading institutions that produce the greatest number of degrees awarded in Mathematics Teacher Education and Secondary Education and Teaching combined during the fiscal year of 2016 (University Systems of Georgia, 2017). Each institution offers degrees in initial teacher preparation with concentrations in mathematics (and secondary mathematics) education.

For purposes of organizing the participants by their associated institutions, I classify the institutions by four types\(^{21}\) (see Table 3): (a) large public institutions, (b) medium public institutions, (c) small private institutions, and (d) Historically Black Colleges and Universities (HBCUs). The large public institutions have an enrollment of over 20,000 students and are further identified by the Carnegie Classification of Institutions of Higher Education’s (2017) classification\(^{22}\) as doctoral universities with a moderate to high research focus. The medium public institutions have an enrollment of approximately 10,000 students and are inclusive of master’s colleges and universities and doctoral universities with a moderate research focus. The small private institutions have an enrollment of approximately 2,000 to 5,000 students and are described as doctoral universities, master’s colleges and universities, and baccalaureate colleges. The HBCUs (1 private institution and 1 public institution) have an enrollment of approximately

\(^{21}\) I classified each institution based on the size (number of students enrolled) and the type (public or private) as shared by the participant. Although I did cross-check the number of students enrolled with the Carnegie Classification of Institutions of Higher Education (2017), I did not use Carnegie’s size classification that describes large institutions as 10,000 or more degree-seeking students, medium institution as 3,000 to 9,999 degree-seeking students, and small institutions as 1,000 to 2,999 degree-seeking students. Instead, I grouped institutions based on similar numbers of degree-seeking students as respectively noted.

\(^{22}\) The Carnegie Classification of Institutions of Higher Education (2017) classified institutions as doctoral universities if they awarded at least 20 doctoral degrees per year. Institutions identified as master’s colleges and universities awarded at least 50 master’s degrees and fewer than 20 doctoral degrees per year. Institutions identified as baccalaureate colleges awarded at least 50 percent baccalaureate or higher degrees but fewer than 50 master’s degrees or 20 doctoral degrees per year.
3,000 undergraduate students and are inclusive of master’s colleges and universities as well as baccalaureate colleges.

Table 3

Participants’ Associated Institutions of Higher Education

<table>
<thead>
<tr>
<th>Type of Institutions</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Public Institutions</td>
<td>Heather</td>
</tr>
<tr>
<td></td>
<td>Patrick</td>
</tr>
<tr>
<td>Medium Public Institutions</td>
<td>Anna</td>
</tr>
<tr>
<td></td>
<td>Claire</td>
</tr>
<tr>
<td>Small Private Institutions</td>
<td>Emily</td>
</tr>
<tr>
<td></td>
<td>Kevin</td>
</tr>
<tr>
<td></td>
<td>Sara</td>
</tr>
<tr>
<td>Historically Black Colleges and Universities</td>
<td>Bianca</td>
</tr>
<tr>
<td></td>
<td>Maria</td>
</tr>
</tbody>
</table>

Note. Participants’ names are pseudonyms.

The participants’ institutions of higher education also represent a variety of student demographics (see Table 4). The large public institutions are predominantly White, which is similar to the small private institutions. The HBCUs consist of predominantly Black students, whereas the medium public institutions are diverse with approximately half of the students non-White.

Table 4

Student Demographics Percentages of Participants’ Institutions

<table>
<thead>
<tr>
<th>Participant’s Institution</th>
<th>Asian</th>
<th>Black</th>
<th>Hispanic</th>
<th>White</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anna</td>
<td>4</td>
<td>26</td>
<td>8</td>
<td>56</td>
<td>6</td>
</tr>
<tr>
<td>Bianca</td>
<td>0</td>
<td>97</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Claire</td>
<td>1</td>
<td>40</td>
<td>5</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>Emily</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td>82</td>
<td>5</td>
</tr>
<tr>
<td>Heather</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>73</td>
<td>3</td>
</tr>
<tr>
<td>Kevin</td>
<td>8</td>
<td>20</td>
<td>6</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>Maria</td>
<td>0</td>
<td>85</td>
<td>10</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Patrick</td>
<td>4</td>
<td>21</td>
<td>9</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>Sara</td>
<td>1</td>
<td>26</td>
<td>5</td>
<td>65</td>
<td>3</td>
</tr>
</tbody>
</table>

Note. Approximate percentages collected from participants and CollegeData (2018).
A look at the participants’ demographics and experiences (see Table 5) also provides insight regarding the spectrum of those who contributed their understandings and experiences to the study. Of the participants, seven identified as female and two identified as male. As for the participants’ race, one identified as Black and eight identified as White. All but one of the participants described their place of origin as the United States. Most of the participants were between the ages of 35 to 49; however, 1 participant identified as 25 to 34 years and 2 participants identified as 50 to 64 years. Six participants stated they taught in the K–12 classroom for 6 to 10 years. The other 3 participants taught from 1 to 3 years, 11 to 15 years, and 21 or more years, respectively. As a teacher educator (professor), the participants ranged from beginner to experienced professionals in academia. Participants also received a variety of degrees in mathematics, mathematics education, and other education disciplines throughout their academic careers.

Table 5

<table>
<thead>
<tr>
<th>Participants’ Demographics and Experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Race</td>
</tr>
<tr>
<td>Black</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Place of Origin</td>
</tr>
<tr>
<td>International</td>
</tr>
<tr>
<td>United States</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>25–34</td>
</tr>
<tr>
<td>35–49</td>
</tr>
<tr>
<td>50–64</td>
</tr>
</tbody>
</table>
Years as Classroom Teacher (K–12)

<table>
<thead>
<tr>
<th>Duration</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–3</td>
<td>1</td>
</tr>
<tr>
<td>4–5</td>
<td>0</td>
</tr>
<tr>
<td>6–10</td>
<td>6</td>
</tr>
<tr>
<td>11–15</td>
<td>1</td>
</tr>
<tr>
<td>16–20</td>
<td>0</td>
</tr>
<tr>
<td>21+</td>
<td>1</td>
</tr>
</tbody>
</table>

Years as Teacher Educator

<table>
<thead>
<tr>
<th>Duration</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–3</td>
<td>2</td>
</tr>
<tr>
<td>4–5</td>
<td>2</td>
</tr>
<tr>
<td>6–10</td>
<td>1</td>
</tr>
<tr>
<td>11–15</td>
<td>1</td>
</tr>
<tr>
<td>16–20</td>
<td>2</td>
</tr>
<tr>
<td>21+</td>
<td>1</td>
</tr>
</tbody>
</table>

Type of Educational Training

Undergraduate

- Mathematics: 4
- Mathematics Education: 2
- Other Education: 2
- Other Non-Education: 1

Master’s

- Mathematics: 2
- Mathematics Education: 1
- Other Education: 6

Doctorate

- Mathematics: 1
- Mathematics Education: 5
- Other Education: 3

Note. Examples of other education include elementary, computer science, reading, and special education as well as curriculum studies.

The diversity in the participants’ demographics, experiences, and associated institutions was intentional given that I used stratified purposeful sampling to select the nine secondary mathematics teacher educators to engage with the research process. My rationale behind using purposeful sampling was to select “information-rich cases for study in depth…from which one can learn a great deal about issues of central importance to the purpose of the inquiry” (Patton, 2002, p. 230). I grouped participants based on their associated institutions’ classifications and
demographics. By stratifying the samples in this manner, I selected participants from varying contexts and settings to facilitate meaningful comparisons that would contribute to my overall understanding of the phenomenon.

Using purposeful sampling to select participants for the study has both advantages and concerns. In purposeful sampling, there are a variety of sampling strategies and techniques that can be used, including that of stratified purposeful sampling. The variety allows researchers to select which sampling strategy is best suited for the study’s purpose and the resources available, such as each participant’s expertise and the study’s time constraints (Patton, 2002). Given that my inquiry looks at Georgia’s secondary mathematics teacher educators’ responses to navigating the edTPA and professional organizations’ initiatives when preparing prospective secondary mathematics teachers, a selection of participants from different institutions in varying contexts helps to capture a variety of responses.

However, for me to combat the criticism of purposeful sampling being subjective and of non-probability-based selection, I must acknowledge my researcher bias. After placing the prospective participants in subgroups based on homogeneous institution classifications and demographics, I selected information-rich cases that I believed would provide me with a “good” representation of Georgia’s secondary mathematics teacher educators. I wanted to capture participants’ responses from institutions with student enrollment numbers of large, medium, and small sizes. I thought that the size of the institution would be comparable to the number of students enrolled in the institution’s initial teacher preparation program. I also thought the size of the institution might influence faculty member collaboration and individualized prospective teacher support.
Other factors that were important for me to consider included the institutions’ types and student demographics. I wanted to make sure my sample consisted of both public and private institutions. I thought an institution’s funding, affiliation, and overall mission might influence the participants’ responses; thus, I wanted to have a balance of public and private institutions. Additionally, I wanted to recruit HBCUs to ensure I had participants from institutions of varying student demographics. I decided not to include potential participants from Georgia State University because of my current affiliation and involvement at the university.

Data Collection and Management

Data collection describes the process where a researcher considers the methods used to collect the data, engage with the participants, and obtain the necessary information vital to the research. Given this study’s purpose to examine secondary mathematics teacher educators’ responses to the edTPA and professional organizations’ reform initiatives when preparing prospective secondary mathematics teachers for teacher certification, I employed a phenomenological interview following the guidance of Kvale’s (1996) seven stages of a qualitative interview investigation: (a) thematizing; (b) designing; (c) interviewing; (d) transcribing; (e) analyzing; (f) verifying; and (g) reporting. In what remains of the chapter, I discuss my steps taken to implement a phenomenological interview, make meaning from the collected data, and communicate the findings of the study.

Upon gaining Institutional Review Board (IRB) approval, I initiated contact with potential participants by gathering names and contact information (i.e., email addresses and phone numbers) from public websites of institutions of higher education that had initial teacher preparation programs in charge of preparing prospective secondary mathematics teachers. Using the retrieved information, I reached out, via email, to potential participants with a research
recruitment email (see Appendix A). In the email, I explained my study’s purpose, stated the study’s inclusion criteria, and provided an overview of the potential participants’ roles.

Those interested in volunteering their time and expertise were asked to reply to me via email or phone to receive more information, including the next steps. Additionally, those with further inquiries about the study were asked to reply to me via email or phone. As not to rely solely on retrieving potential participants from institutions’ public websites, in case the websites were not current or inclusive of all employees, I also asked potential participants in my email if they knew of other colleagues who met the study’s criteria. Upon receiving additional potential participants’ information (most of which I had already emailed), I sent out another round of research recruitment emails.

I sent a total of 105 emails to potential participants\(^{23}\) from 28 institutions of higher education throughout the state of Georgia. Of the 105 emails sent, I received 48 responses indicating that the potential participant was not able to participate or did not meet the study’s inclusion criteria. I received 14 responses indicating that potential participants were interested in the study. Of the remaining 43 potential participants, I either did not hear back from them until after I began the study or never received any word at all.

I recruited potential participants for 2 weeks.\(^{24}\) As I received confirmation from potential participants, I placed them and their respective institutions into stratified categories based on the

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\(^{23}\) I discovered that institutions’ websites shared faculty member information in various ways. Some institutions provided lists of everyone in the department without identifiers detailing specific roles. In cases such as this, I had to seek additional information (e.g., curriculum vitae, lists of courses taught, research profile) to determine if the potential participant met the inclusion criteria for the study. I received approximately 20 emails indicating that the potential participant was not suitable for the study (e.g., retired, taught only mathematics content, taught other disciplines in education).

\(^{24}\) If I had not received a response at the end of the first week of recruitment, I sent a follow-up email (see Appendix B) making sure that the potential participant did not have any further questions about the study. The follow-up email served as a way for me to get on the potential participants’ radar again as well as provide clarification.
institutions’ types, sizes, classifications, and demographics to purposefully select nine participants to obtain a representative sampling of institutions from varying contexts. At the end of the 2-week recruitment period, I contacted my selected participants via email to confirm their participation in the study. All participants were on board to continue with the study; therefore, I alerted the remaining five participants that they were not selected for the study.

My participant confirmation email (see Appendix C) addressed the details of the study and included the participant consent form (see Appendix D). Although the participant consent form was available to the participants via email, the email informed the participants that the participant consent form would be reviewed with each participant and signed prior to the start of the first interview. The participant confirmation email also asked the participant for his or her preference of date, time, and location to conduct the first interview. Following the interview, the participant would be asked to provide artifacts (e.g., course syllabi, activities, assessments, projects, dissociated teacher candidates’ work samples) that reflected what the participant used to prepare, instruct, and assess prospective secondary mathematics teachers.

For the initial interview, I traveled to the participant’s office (unless otherwise noted per the participant’s request) to develop a face-to-face interview relationship. By visiting the participant’s office at his or her institution, I gathered an understanding of the participant’s setting and context. Additionally, a face-to-face interview helped me to establish a personal interaction to “enter into the other person’s perspective” (Patton, 2002, p. 341). As for the remaining two interviews, I offered to meet with the participant in person, over the phone, or

25 Two of the nine participants requested that the first interview be conducted via phone to accommodate their schedules. I respected my participants’ requests and conducted the interviews via phone. Prior to conducting the first interview, I reviewed the participant consent form with the participants and answered any questions. I also made sure to receive the signed consent before the start of the first interview.
through a web-based conference call platform (e.g., Skype). Two days prior to the participant’s scheduled interview, I sent a reminder email addressing the interview plans. In this email, I confirmed the location and the method of the interview.

All three of my interviews were semi-structured. A semi-structured interview differs from structured and unstructured interviews in that it interweaves both scripted questions and open discussion to initiate questions and follow-up probes based on interviewees’ responses (Roulston, 2010). Therefore, conducting semi-structured interviews enabled me to probe for ideas about my studied phenomenon. Prior to conducting each interview, I created an interview protocol—a tool consisting of targeted questions—that addressed topics pertaining to my research inquiry and guided the direction of the interview. (See Appendices E, F, and G for examples of my interview protocols.) Given the flexibility of a semi-structured interview, I referred to the interview protocols throughout the interviews and selected the probing questions that were appropriate as the interview progressed. If a participant previously answered a question in an earlier response, I skipped over the question and moved on to the next question. I also left room for participants to share their worldviews. Being able to divert off-script opened opportunities to explore new ideas that contributed to the phenomenon of interest.

Given that the purpose of the study was to examine participants’ responses and experiences preparing secondary mathematics teacher candidates for the Secondary Mathematics edTPA while navigating professional mathematics education organization’s reform initiatives, I used phenomenological interviews—a type of interview that explores and obtains in-depth descriptions of lived experiences (Roulston, 2010). In phenomenological interviews, the interviewer conveys a “neutral but interested stance” so much so that the relationship depicted between the interviewee and interviewer is described as “pedagogical, in that the interviewer’s
role is to be a student of the interviewee, learning as much about the topic of inquiry as possible through sensitive questioning” (p. 17). Thus, the interviewer is tasked with providing a supportive environment where the participant feels comfortable providing in-depth descriptions of his or her lived experiences. To establish a supportive environment for phenomenological interviewing to occur, the “interviewer must listen carefully, follow up on participant’s responses without interrupting the story flow to gain specific details of the participant’s experiences, and generally exercise reservation in contributing to the talk” (p. 17).

When I asked my interview questions, I made sure I asked “good” questions—those that avoided leading, dichotomous, and double-barreled questions (Fontana & Frey, 1994; Payne, 1951). I also used open-ended questions to probe for in-depth descriptions of the participants’ responses and avoid single-word responses. Sparingly, I used closed questions mainly to clarify understandings. Additionally, to acquire even further understanding, I embedded participants’ words in questions and used follow-up probes to reiterate responses.

I was also cognizant of the language used in my questions; I wanted my questions to be understood by my participants. Although I acknowledge that I may have similar experiences to that of a participant preparing prospective teachers for the Secondary Mathematics edTPA, I did not want to assume that an understanding of terminology, expressions, and general content was shared. Thus, I made sure to clarify questions and responses to generate a clear understanding between the participant and me. As the data collection progressed and I interviewed more participants, I found myself slightly modifying the interview questions to address new topics and clarify previously collected data.

As requested in the participant recruitment email and initial contact made to schedule the first interview, I asked my participants at the close of the initial interview for artifacts that
reflected what they used to prepare prospective secondary mathematics teachers. The artifacts I received included course syllabi, activities, assessments, project descriptions with corresponding rubrics, course readings, and (dissociated) teacher candidates’ work samples. The collected materials served as talking points for the second interview and provided me with corroborating sources of evidence. For example, if a participant described implementing a task in a methods course that used prompts reflecting that of the Secondary Mathematics edTPA, I inquired about receiving a copy of the task’s description, assessment rubric, and possible work samples.

Prior to the second interview, I reviewed the provided artifacts and generated questions to guide a portion of my second interview protocol (see Appendix F). The questions enabled me to seek further understanding and clarification regarding how the participants used the artifacts. I also inquired about the inspiration and purpose for certain activities as well as what desired results were to be achieved from implementing the artifact. Whereas the first interview with each participant provided me with an understanding of one’s response through reflection, the second interview was artifact-elicited to draw another understanding of what each participant actually used to prepare prospective secondary mathematics teachers for the teaching profession, including the Secondary Mathematics edTPA. Another part of the second interview enabled me to explore how the participants developed prospective secondary mathematics teachers’ understandings of the social contexts of mathematics teaching and learning. I met seven participants face-to-face to conduct the second interview. I conducted the other two participants’ interviews via phone.

Following the first and second interviews, I transcribed the audio-recorded conversations to recapture through a different medium what was said. Although I may have not needed to transcribe every word spoken, I transcribed the entire conversation verbatim as not to overlook
anything that might be of value for me to reference at a later time. As described by Gibbs (2007), researchers should make the necessary time commitment to transcribe verbatim given that “ideas you have at the start of the analysis, which might lead you to decide what parts need transcribing, may well be different from those you develop later in the study” (p. 12). Additionally, engaging in transcription, although time consuming, helped me familiarize myself with the content and begin to formulate ideas pertaining to the analysis of the data.

Prior to the third (follow-up) interview, each participant received, via email, full transcripts of both interviews for review. In the member-checked transcript email (see Appendix H), I asked each participant to read through his or her transcripts and highlight anything that he or she deemed most reflective of one’s response navigating the edTPA and professional organizations’ reform initiatives in the preparation of prospective secondary mathematics teachers. By having my participants complete this task, I could see what stood out most to my participants and what best summarized their responses to reform in mathematics teacher education.

I also asked each participant to review the transcripts and edit, delete, elaborate, and clarify his or her own words, if necessary. I made sure to alert the participants that filler words and grammatical issues would not be of concern for correction (unless edits were desired) given that conversational language is quite different from text (Carlson, 2010). I also cautioned the participants that they might express feelings of self-consciousness, embarrassment, and uncertainty when reviewing their contributions; however, I assured each participant that I valued and respected each perspective for its contribution to the broader understanding. All of the participants returned their member-checked transcripts (some with more highlights, edits, deletions, and clarifications than others).
After the participants returned their reviewed transcripts, I used the feedback to guide my interpretation of the data collected, more of which I discuss in the next section. With the write-up of my initial analyses, I scheduled a third (follow-up) interview with each participant (see Appendix G for the interview protocol). The interview enabled me to member-check with my participants, yet again, the transcripts and present my initial analyses. I also confirmed participant demographics and experiences. As in the first two interviews, I audio-recorded the member-checking interview in case I needed to review a participant’s confirmed interpretation. Eight of the nine participants completed the third (follow-up) interview via phone. I met the other participant in-person per the participant’s request.

Throughout the interview data collection, I remained cautious that “most transcripts only capture the spoken aspects of the interview and miss out the setting, context, body language and general ‘feel’ of the session” (Gibbs, 2007, p. 11). Thus, I also documented my thoughts pertaining to the interview sessions via an audio recorder and in a researcher’s reflexivity diary. I noted descriptions of the setting and context in which each interview occurred as well as my interactions with the participants. Being reflexive of my interactions with the participants assisted me in my data analysis and justification of qualitative “reliability.”

To assist with data management, I used NVivo, a qualitative data analysis computer software program, to store, organize, and analyze my interview transcripts and artifacts. I learned of NVivo through my university’s library and enrolled in a tutorial workshop. I imported my data into the system and developed codes to assist with my analysis, more of which I address in the

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26 In the future, I would collect the participant’s demographic and experience information during the first interview. I initially thought I could gather the answers to the questions throughout my conversations (i.e., the first or second interviews); however, I did not directly ask about some information (e.g., place of origin, type of educational training, years as a classroom teacher) and had a few gaps in my analysis. Thus, I made sure to confirm responses during the third (follow-up) interview.
next section. In addition to NVivo, I created a binder for each participant to store a hard copy of the supporting evidence. The binders remained in a locked filing cabinet in my office. Next, I address how I conducted my data analysis.

**Data Analysis**

Analysis of qualitative data demands intellectual rigor, commitment to hard work, and thoughtful evaluation (Patton, 1987). Throughout the research process, I engaged in rigorous analysis of my collected data, which consisted of interviews, artifacts, and my researcher’s reflexivity diary. To assist with analyzing the phenomenological interview data, I used Kvale’s (1996) six steps of conducting interview analysis and his meaning-making methods.

During my first interviews with the participants, I listened to the participants describe their lived worlds, the first step of Kvale’s (1996) interview analysis. I made note of the participants’ feelings, experiences, and actions in response to the edTPA and professional organizations’ reform initiatives. However, this step suggests that few interpretations be made from both the interviewee and the interviewer given that the emphasis is on the participant telling his or her story of the topic (Kvale, 1996).

As I probed the participants for more detail during the first interviews, the participants began to discover new relationships and unveil new meanings in their responses, the second step of Kvale’s (1996) interview analysis. Here, “the interviewees themselves start[ed] to see new connections in their life worlds on the basis of their spontaneous descriptions, free of interpretation by the interviewer” (p. 189). Although I observed the participants make sense of their meanings, I refrained from adding my own interpretations to ensure my participants had uninterrupted time to complete their thoughts.
Once the participants finished their responses, I interpreted the participants’ meanings and shared my understanding with the participants, the third step of Kvale’s (1996) interview analysis. This step occurred in both the first and second interviews. The participants had opportunities to reply to my interpreted meanings and either confirm or refute my understanding. Thus, the step resulted in “a ‘self-correcting’ interview” (p. 189). I also used the gathered artifacts from the participants to corroborate my interpretations of the ways the participants prepared, instructed, and assessed their prospective secondary mathematics teachers.

For the fourth step of Kvale’s (1996) interview analysis, the researcher makes interpretations from the transcriptions. To assist with my meaning-making, I considered Kvale’s (1996) five approaches to the analysis of meaning: (a) condensation; (b) categorization; (c) narrative structuring; (d) interpretation; and (e) ad hoc methods. With meaning condensation, the interview data are compressed into shorter statements that still convey the main sense of the participants’ meanings but are rephrased in fewer words. Meaning categorization suggests for the interview data to be organized into categories that are developed in advanced or during the analysis and reflect theory or the participants’ vernacular. Narrative structuring probes for the temporal or social meanings found in the interview data and retells the participants’ shared stories. With meaning interpretation, the interview data are structured to extract speculative reasoning and decontextualize statements with theory. The ad hoc method for generating meaning uses a variety of the previously noted approaches.

For this study, I used Kvale’s (1996) ad hoc method and incorporated methods of condensation, categorization, narrative structuring, and interpretation. To ready my data for analysis, I went back through the transcripts and distinguished between essential and non-essential material. I defined essential material to be information that answered my interview
questions and contributed to my research inquiry. The non-essential material, although often interesting, was labeled as such and removed from the focus of my analysis. Of what remained, I started “developing the meanings of the interviews, bringing the subjects’ own understanding into the light as well as providing new perspectives from the researcher on the phenomena” (p. 190).

I used Kvale’s (1996) meaning categorization to organize participants’ long interview passages into categories. The categorization provided me with a structure from which I then implemented meaning condensation to further reduce the participants’ passages into shorter statements or codes. The codes reflected key words or phrases that summarized or captured the essence of what the passage communicated. In particular, I used In Vivo code—a direct use of words from the text—and descriptive code—a summarization of the primary topic (Saldaña, 2016). The coding process enabled me to group and label data in such a way that appeared manageable in both its display and response to the research questions (Grbich, 2013). Then, I organized the codes into a coding chart (see Appendix I) that assisted with my meaning-making. I used narrative structuring to cast a story describing the participants’ meanings and engaged in meaning interpretation to bridge reasoning with theory.

With my transcripts analyzed and interpreted, I conducted a third (follow-up) interview with my participants to re-interview, the fifth step of Kvale’s (1996) interview analysis. A re-interview provided an opportunity for the participants to again “self-correct” the researcher’s interpretation as well as elaborate or clarify the statements. The participants agreed with my

27 The categories addressed the following: (a) participant demographics; (b) institution description; (c) teaching methods; (d) edTPA; (e) equity; (f) access; (g) achievement; (h) identity; (i) power; (j) NCTM; and (k) AMTE.
interpretations and provided minor additions. I incorporated the additions in my analysis as I prepared for reporting on the study’s findings.

As described by Kvale (1996), the sixth (possible) step of the interview analysis reflects an opportunity for action to be taken as a result of new insight. Here, the participants begin to act on the insight gained during the interview. Although my interaction with the participants ended with the third (follow-up) interview, several participants expressed that the interview process made them reflect on their practices and the ways reform dominated the discourse of their program curricula. Some participants also wanted to familiarize themselves more with AMTE’s (2017) Standards for Preparing Teachers of Mathematics and consider implementing the recommendations into their teaching practice. Given the nature of the study, I was not able to explore if the participants followed through with such actions, for an action research study would be better suited for this last step.

As part of my data analysis, I also journaled in my researcher’s reflexivity diary and performed analytic memo writing. The analytic memo writing assisted with my reflection and extraction of relevant information to guide my conceptualization and acquire a deeper understanding of my research interest. As I coded the transcripts, I made notes in the margins to assist with moving from codes to themes that would guide my report on the findings. Additionally, the analytic memo writing enabled me to reflect on unanswered questions and frustrations with my analyses as well as contemplate future research directions (Saldaña, 2016).

With an in-depth analysis of each participant, I then considered how I would contribute theory to the phenomenon of secondary mathematics teacher educators’ responses to navigating the edTPA and professional organizations’ initiatives in my report. For organizational purposes, I grouped the participants with respect to the embedded units of analysis and narrated the various
responses given the different contexts. I then used my meaning-making and interpretations to present the overarching themes that emerged. The themes were then used to answer my research questions. I also made cross-comparisons addressing the units in relation to the themes but kept my focus on the case of secondary mathematics teacher educators in Georgia. These steps were taken to present the study in a comprehensive manner so that the reader could feel as if he or she was an active participant in the study, so much so that he or she could determine if the findings could be applied to a different context (Baxter & Jack, 2008).

**Ethical Concerns**

Throughout the study, I continuously reflected on my awareness of ethical concerns. Prior to my initial contact with the prospective participants, I submitted the necessary material to receive IRB approval. Once granted approval, I distributed the study’s participant consent form to the participants. The participant consent form advised the participants “what they are letting themselves in for, what will happen to them during the research, and what will happen to the data they provide after the research is completed” (Gibbs, 2007, p. 8). More specifically, the participant consent form made the participants aware of the research’s purpose and their role as a participant.

Given the nature of the study, each participant volunteered to participate in two interviews facilitated by the researcher, no more than an hour each, over the course of one month. Prior to the second interview, each participant shared artifacts, which took no more than 30 minutes to retrieve for the researcher. An additional 1-hour third (follow-up) interview was arranged for member-checking and validation of claims. Prior to this interview, each participant reviewed his or her interview transcripts, which took no more than 30 minutes to review. Thus,
each participant committed a total of no more than 4 hours of his or her time to participate in the research process over a time span of 3 to 4 months.28

Additionally, the participants were made aware of the risks involved with their voluntary participation, which did not extend beyond the normal risks of daily life. Participants did not receive any compensation for participating in the research process, but they knew society would benefit from the knowledge gained from the findings of the research. If at any time a participant wished to refrain from answering interview questions or terminate his or her participation in the study, he or she could without any questions. All research collected up until the point of withdrawal would also be discarded to respect the wishes of the participant.

Given that qualitative data is individual and personal, researchers must be “sensitive to the possible harm and upset their work might cause the participants” (Gibbs, 2007, p. 8). To preserve the anonymity of the participants, I identified each participant with a number and a pseudonym. I referenced the participant’s number when conducting all three interviews and made sure to relabel any identifying information (e.g., colleagues, course titles, institutions, position titles) with pseudonyms. I generated a list of the identifiers with their associated numbers and pseudonyms to keep track of any relabeled information. This list was stored in a separate file from the collected data in a locked filing cabinet. Ten years from the completion of the study, I will destroy the data, including the signed consent forms. Until then, everything will remain securely stored.

28 Participants received their transcripts approximately 3 to 4 weeks after they completed the second interview. Unfortunately, this was near the end of the semester. Some participants provided me with the member-checked transcript before the holiday break; however, I received most of the transcripts the next semester. The third (follow-up) interview was scheduled immediately after receiving the member-checked transcript. Given the break between semesters, some participants participated in the research over a period of 3 months and others over 4 months.
Given that my main method of data collection encompassed interview data, I made sure to remain ethical by staying true to what my informants shared. I checked my interview transcriptions against the audio-recordings at least twice and used member-checking to confirm the accuracy of any statements used to guide my analysis. As I retold one’s story, I remained mindful of how I negotiated another’s word with that of my own. When my memory failed me, even with the corroborated interview transcripts and notes, I took it upon my own responsibility as a researcher retelling another’s experience to reconnect with the informant and validate my understanding (Fournillier, 2017).

Additionally, for the quality of my work to be considered ethical, I remained reflexive of my researcher’s subjectivity throughout the research process. Addressing my reflexivity brought awareness to my feelings, assumptions, and perceptions that guided my actions and decisions (Darawsheh, 2014). I also used reflexivity to reflect on my interactions with my participants and how such interactions influenced my relationship with each participant. For example, I evaluated my interview interactions, including the performance of my participants as well as my own, and considered how this reflection influenced not only my next encounter with that particular participant but also my future encounters with others.

By sharing my thoughts, the factors that influenced my thoughts, and how both influenced my research process, readers are informed of how my background and experiences guided my decisions as a researcher. Thus, acknowledging the researcher’s findings as a product of the researcher’s interpretations (Jootun, McGhee, & Marland, 2009) enabled me to use reflexivity to combat my issues of subjectivity. I consider my ethical responsibilities as a researcher to ensure that appropriate trust is established between the participants and the researcher as well as that of the reader.
Qualitative “Reliability”

To ensure I produced quality work, I considered the criteria for judging the “reliability” of my qualitative research, which included credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). In credibility, the researcher must establish believable results from the participants. Given that qualitative research can be used to understand a participant’s perspective on a situation or phenomenon, the participant is the judge of credibility. I used member-checking to address the credibility of my interview transcripts and confirm initial analyses with that of my participants. The review process also led me to new understandings of the data. With new insight, I made appropriate corrections in my interpretations to increase the accuracy and build credibility.

Another consideration to address is transferability—the degree to which the findings can be generalized or transferred to other contexts (Lincoln & Guba, 1985). A case study examines participants in their unique contexts (Stake, 1994). As described by Stake (2005), “the purpose of a case report is not to represent the world, but to represent the case” (p. 460). Thus, a bounded case should not be used to generalize. To help with transferability, I provided detail describing the context, such as the institution and the participants, as well as the assumptions guiding the research process. From there, the reader could decide if the case was comparable to his or her situation.

The dependability of the research is comparable to the concept of reliability (Lincoln & Guba, 1985), which assumes that if I conducted the research twice, the same results would be made. However, qualitative researchers are not about “measuring” things twice given the ever-changing context. Therefore, I purposefully account for the unique context of my research and openly share my meaning-making steps that contributed to my interpretations and findings. I also
refrain from making comparisons with other cases outside of my context. As cautioned by Stake (2005), “conclusions about measured difference between any two cases are less to be trusted than are conclusions about a single case…[however] illustration of how a phenomenon occurs in the circumstances of several exemplars can provide valued and trustworthy knowledge” (pp. 458–459). Thus, I extend my findings among others to better understand the phenomenon of interest.

For the last consideration, I must consider confirmability—the degree to which results are consistent (Lincoln & Guba, 1985). Although I bring a unique perspective to the study, I need to make sure my results are consistent when viewed by another. Thus, I made sure to be transparent with every step taken throughout the research process so that another researcher could follow my footsteps and arrive at somewhat the same result. To attain transparency, I created a chain of evidence and supported all claims with references to participants’ shared experiences. Additionally, I triangulated my findings with varied sources of evidence, including interview transcripts, artifacts, and member-checked feedback.
CHAPTER 5
RESULTS

I report on nine secondary mathematics teacher educators from nine institutions throughout Georgia. To further contextualize the participants in their respective institutions’ settings, I describe each participant’s role at the institution and his or her shared insight regarding the institution’s initial teacher preparation program, including the methods courses, clinical field experiences, and overall mission. I also share how each participant responds to the edTPA and professional mathematics education organizations’ initiatives with respect to the preparation, instruction, and assessment of their prospective secondary mathematics teachers. In particular, I highlight common themes depicted in the participants’ shared responses and experiences. The themes address edTPA as a catalyst for: (a) motivating program modifications; (b) accommodating edTPA preparatory assignments; (c) altering awareness and discourse in teacher preparation; (d) perpetuating beneficial and detrimental teaching messages; (e) threatening academic freedom; (f) escalating stress and anxiety; (g) developing as a potential gatekeeper; and (h) dehumanizing and deprofessionalizing mathematics education. As per the professional mathematics education organizations, I discuss the participants’ views of the recent efforts of AMTE and NCTM and the way they see such initiatives leading the charge for the future of mathematics education. I close the chapter with discussion on how secondary mathematics teacher educators develop prospective secondary mathematics teachers’ understandings of the social contexts of mathematics teaching and learning, with specific attention to equity in terms of access, achievement, identity, and power.
Participants and Institutions

Participants from Large Public Institutions

For this study, I selected two participants from two large public institutions in Georgia. The participants provided a context for me to understand the roles and responsibilities of a secondary mathematics teacher educator preparing prospective secondary mathematics teachers at public institutions with an enrollment of over 20,000 students. The first participant introduced is Heather. Her institution’s demographics are described as 73% White, 10% Asian, 8% Black, 7% Hispanic, and 3% other. The second participant introduced is Patrick, where his institution’s demographics are described as 60% White, 21% Black, 9% Hispanic, 4% Asian, and 6% other. Both institutions’ students are described as traditional in that they typically enroll in the institution following high school. This description also extends to the initial teacher preparation programs at each institution. In the following sections, I contextualize each participant at his or her institution and reveal insight into the teaching practice of each one to provide a backdrop for further analysis.

Heather. Heather describes her role at her institution as a secondary mathematics teacher educator and program coordinator. Her job responsibilities include planning courses for the mathematics education program and confirming that the program is compliant with various state regulation and certification requirements. She has been at the institution for approximately a decade and continues to be integrally involved in planning the mathematics education program.

A few years prior to the edTPA being adopted by the state, Heather worked with colleagues to redesign the mathematics education program based on feedback gathered from prospective teachers who shared what they believed was needed to be effective mathematics teachers upon leaving the program. What came to the forefront was “really good content
preparation that included content that they [the prospective teachers] would be teaching, not just collegiate content” (Interview 1, October 23, 2017). Therefore, the program designed a sequence of three content-driven methods courses.

Additionally, the program wanted to provide prospective teachers with more opportunities to interact with K–12 students. Thus, the program incorporated structured field experience labs aligned with each methods course. The labs allowed prospective teachers to build on their teaching responsibilities by first tutoring students on a one-on-one basis and then instructing students in small-group and whole-class settings prior to their student teaching field experiences. The program also implemented paired student teaching field experiences to encourage reflection.

Heather typically teaches the first and third methods courses on a rotating basis; however, as a program coordinator, she is knowledgeable about all three methods courses and the student teaching semester. The first methods course focuses on learning theories and student thinking: “We start out with helping our preservice teachers to understand the importance of knowing what their students know and being able to figure out what they’re actually meaning when they’re talking to them” (Interview 1, October 23, 2017). Prospective teachers complete a learning theory assignment that requires them to work in groups to research an assigned learning theory and find illustrations of what teaching and learning might look like if a mathematics teacher employed the learning theory. They write a short paper and present their findings to the class. Prospective teachers also complete a task design that encourages them to think about student thinking and what can be done to build on students’ understandings of mathematical concepts. Thus, the course focuses on introducing prospective teachers to cognitive demand and the beginning stages of planning an individual task, not an entire lesson. The corresponding lab also
has the prospective teachers attend a local high school with their instructor and tutor one-on-one with students in three separate classes (various levels) for a total of three times each.

The second methods course focuses on topics of diversity, equity, differentiation, and assessment. In this course, “preservice teachers learn various ways to assess their students and also how to use the information that they gain in those assessments to differentiate their instruction” (Interview 1, October 23, 2017). They also talk about culturally relevant pedagogy, building an equitable classroom, and strategies for equitable pedagogies. The course also requires the prospective teachers to write lesson plans, plan assessments, and then instruct based on the assessments. The associated lab and methods course are held at a local middle school, where prospective teachers engage in small-group instruction in six teachers’ classes multiple times throughout the semester.

In the third methods course, prospective teachers address topics of formal lesson planning, unit planning, orchestrating discourse, argumentation, and supporting student reasoning. In addition, prospective teachers complete a video reflection assignment. The assignment is a peer-teaching assignment, where prospective teachers develop a lesson plan to address assigned content (i.e., probability) and teach the lesson to their peers in class. The lesson is recorded to allow the prospective teachers to watch and reflect on their teaching. More specifically, the prospective teachers are to reflect on their questioning and how their peers engaged with the task. Some of the reflection questions are similar to those asked by the edTPA; however, the assignment is not viewed by Heather as an edTPA preparatory assignment, especially given that the edTPA prompts would not make sense for the peer-teaching assignment.

For the associated lab, the prospective teachers complete a practicum field experience, where they are paired with a peer and attend a cooperating teachers’ class twice a week for one
class period. Mid-semester, the prospective teachers attend the class every day for 2 to 3 weeks. During this time, the prospective teachers teach a sequence of three lessons to the whole class. Efforts are made by the program to try to keep the paired prospective teachers in their class for the following student teaching semester.

In the student teaching semester, prospective teachers also enroll in a student teaching seminar where prospective teachers reflect on what is happening during their field experiences and connect that to ideas previously discussed in the three methods courses. This course is the only one where the prospective teachers receive support as they prepare for the edTPA. They also review SCALE’s (2016a) edTPA Secondary Mathematics Assessment Handbook during this last semester.

In the last semester of the program, prospective teachers are required to complete both an exit portfolio and the edTPA. Heather asserts:

We’re probably the only program in the college that does [the exit portfolio] because we don’t believe that edTPA is really a valid measure, and we would rather assess our students’ work than have somebody that we don’t know say whether or not they did a good job. (Interview 1, October 23, 2017)

The exit portfolio requires prospective teachers to complete an assignment that addresses their school environment (e.g., culture). Prospective teachers placed at the same school typically work together on the assignment to find out information specific to the school, the students, and the teachers. Each prospective teacher also submits a unit plan consisting of several lesson plans that

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29 I describe the focus and assignments of the program’s methods courses here to provide the reader with a context for the ways prospective teachers are prepared for teaching at this institution. There is limited mention of the edTPA throughout the methods courses as further discussed in the accommodating edTPA preparatory assignments section. Thus, I provide an in-depth description here to address some of the assignment expectations.
he or she taught throughout the student teaching field experience. The prospective teachers are asked to reflect on the implementation of the unit plan and revise the unit for future use. The framework of the unit plan is similar to what is required for the consecutive lesson plans of the edTPA.

Heather’s methods courses are typically made up of a cohort of 10 to 15 prospective teachers. In planning her methods courses, she aligns the curriculum with the program’s mission to “prepare excellent mathematics teachers to be leaders in their schools who are not afraid to step up and say, ‘Hey, I think we ought to do this, this way’ and are genuinely focused on their students’ thinking and learning” (Interview 1, October 23, 2017). She strives to equip each cohort of prospective teachers with an understanding of how to relate mathematics with real-world situations. She believes “it is important to be able to construct authentic contexts around the mathematical ideas” (Interview 2, November 6, 2017). Thus, she places a huge emphasis on the context and pulls the mathematics out of the context when she prepares her prospective teachers.

Additionally, Heather has her prospective teachers reference several resources throughout her methods courses, including Boaler and Humphreys’ (2005) Connecting Mathematical Ideas: Middle School Video Cases to Support Teaching and Learning, Middleton and Jansen’s (2011) Motivation Matters and Interests Counts: Fostering Engagement in Mathematics, Smith and Stein’s (2011) 5 Practices for Orchestrating Productive Mathematics Discussions, and other various NCTM publications and journals. These resources, along with Heather’s curriculum, tries to communicate to prospective teachers that teaching is a complex endeavor. A teacher’s role is to know how to build on what students already know and what they are thinking. Thus, a teacher must be prepared for every eventuality when stepping in the classroom.
Patrick identifies as a secondary mathematics teacher educator in the institution’s department overseeing secondary and middle grades education. He is also the program coordinator for the initial certification mathematics education programs at both undergraduate and graduate-levels. In his position, he is responsible for teaching methods courses as well as collecting and analyzing program data for accreditation reports to make sure the program is cohesive and coherent. He has only been at the institution for a couple of years but has approximately a decade of experience teaching prospective secondary mathematics teachers at an institution in another state.

As previously stated, Patrick’s institution has initial certification mathematics education programs at both undergraduate and graduate-levels. Each year, there are cohorts of approximately 15 to 20 undergraduate and 5 to 10 graduate prospective teachers enrolled. Both programs provide year-long clinical field experiences; however, each program follows a different structure given the length and expectations of the program. The graduate program begins in the summer semester and ends the following spring semester. In the fall semester, prospective teachers participate in an opening school field experience, where they attend their placement for 1 week of pre-planning and the first week of school. Then, they participate in a practicum that requires 20 hours per week, where they attend two class periods each day of the week. In the spring semester, they participate in a student teaching field experience, where they teach 40 hours per week. For the undergraduate program, prospective teachers participate in a fall practicum that is described as a three-unit clinical field experience. During the practicum, prospective teachers have a few weeks where they spend more time in the classroom than other weeks depending on the requirements of their methods course. The following spring semester,
the prospective teachers complete a student teaching field experience that requires 40 hours per week.

While in the student teaching seminar, both the undergraduate and graduate-level prospective teachers submit their edTPA 3 months into their field experience. Prospective teachers also complete an exit portfolio where they submit various signature assignments previously completed during their methods courses and their student teaching observation forms. Patrick says the main purpose of the exit portfolio is to help with collecting program data for accreditation and does not require additional work from the prospective teacher given the load of the edTPA.

According to Patrick, the faculty members who instruct prospective secondary mathematics teachers at his institution view teaching from cognitive, situative, and sociopolitical perspectives:

We embrace and want to attend to all three, but if we lean in any one direction, we’re interested in the sociopolitical elements of preparing high school math teachers as well as preparing them to understand the sociopolitical elements of their work in the field.

(Interview 1, October 18, 2017)

Furthermore, he adds, “We want our student teachers to enact the mathematical teaching practices that NCTM advocates” (Interview 1, October 18, 2017). Thus, Patrick is attuned to implementing teaching practices that complement this teaching philosophy.

Patrick describes the underlying message of his methods courses as one that raises awareness for problems of practice for mathematics teachers. He says, “Day one I try to disrupt their vision of who they are as a mathematics teacher” (Interview 1, October 18, 2017). He sees his role as a facilitator and ensures equitable access to discourse. He wants his prospective
teachers to “see themselves as a professional” who is “constantly learning” (Interview 1, October 18, 2017). He also strives to have his prospective teachers “leave with a critical perspective on mathematics education” (Interview 1, October 18, 2017).

When planning curriculum for his methods courses, Patrick incorporates mathematics content. He states: “Sometimes, it’s we do math together so we can elicit conversations about teaching. Sometimes it’s that in addition to how might you develop this sort of foundational concept for kids” (Interview 2, November 1, 2017). He emphasizes the importance for teachers to use realistic content and meaning for students to connect with the mathematics. He says: “A realistic context is far more important to me as a math educator than the real-world context. It’s space so the child can reason, can think and imagine” (Interview 2, November 1, 2017).

He also presses his prospective teachers to think about a model for learning that comes out of Carey’s (2014) How We Learn: The Surprising Truth About When, Where, and Why It Happens. Patrick shares with his prospective teachers that students must first explore a topic, muck around in it, and make some sense. He describes this process as developing conceptual understanding. He says that this understanding is then transferred to rough algorithms and time is spent practicing, which is described as procedural fluency. Applications are then used as a way to review and apply the learned content. However, he also sees the need for the initial exploration to be driven by a problem or a puzzle that provokes a student to reason in a way that one has previously not done, which leads to the new mathematical topic. He finds it is important to consider the ways mathematics is positioned as a body of knowledge external to the mathematics of being human that is acted on every day. He challenges that mathematics needs to be rehumanized as a product of human activity. This perspective extends to his view of edTPA, which is later discussed.
Participants from Medium Public Institutions

Representing the medium public institutions in Georgia, I selected two participants named Anna and Claire. Anna’s institution has demographics described as 56% White, 26% Black, 8% Hispanic, 4% Asian, and 6% other. There is a large population of non-traditional students returning to school for their undergraduate and graduate degrees. Claire’s institution is similar to Anna’s in that it offers both undergraduate and graduate programs and has demographics described as 50% White, 40% Black, 5% Hispanic, 1% Asian, and 4% other. Claire further describes the students in the secondary mathematics education programs as being primarily of minority ethnic backgrounds and traditional. I present additional information about the participants and their institutions to provide a context to aid in the analysis of their responses to my research inquiry.

Anna. Anna is a mathematics teacher educator in the institution’s mathematics department. Although her position is outside of the education department, she teaches and supervises prospective elementary, middle, and secondary mathematics teachers. She is also responsible for preparing prospective teachers for the edTPA in her methods courses. She has been at the institution for a few years; however, her institution is in the process of consolidating with another institution, which she foresees might impact programmatic changes in the near future. She says, “We are dealing with the fact that edTPA’s handled in different ways by different schools” (Interview 1, October 25, 2017).

At Anna’s institution, prospective secondary mathematics teachers can pursue two initial teacher preparation programs. The options include receiving an undergraduate degree in mathematics with a teacher certification or a graduate degree in secondary education with a concentration in mathematics. In both programs, prospective secondary mathematics teachers
take an assortment of education courses, which include technology for teachers, educational psychology, exceptional learners, planning for diverse learners, planning instruction and assessment, classroom management, and secondary mathematics methods. Whereas the undergraduate program offers a year-long practicum and student teaching field experience, the graduate program has a semester-long student teaching field experience. There are roughly five prospective secondary mathematics teachers in Anna’s methods courses.

As Anna plans for her methods course curriculum, she considers the program’s vision, which is to “give them [prospective teachers] experience as to what NCTM says in policy papers or what the state says in their documents they release and help them navigate what are best practices to use in their own classroom for students” (Interview 1, October 25, 2017). In her courses, prospective teachers learn how to interpret curriculum and write lesson plans. She states:

The methods course is focused on looking at specific types of instruction, whether it be a three-act task, a number talk, how to use manipulatives, and how to use tiered learning. So, we try to model and help students understand all of the different resources that are available to them to have good student-centered lessons. (Interview 1, October 25, 2017)

Additionally, she facilities activities and discussions that address strategies for representing, reasoning, and problem-solving with mathematics content.

Claire. Similar to Anna, Claire has been at her institution for a couple of years and also teaches prospective elementary, middle, and secondary mathematics teachers. Although she was hired as a secondary mathematics teacher educator, she has had to assume various roles in working with prospective teachers in varying grade-levels and content areas (i.e., mathematics and science). Most of Claire’s prospective teachers are undergraduate students; however, she
does prepare graduate students as well. On average, there are about 10 to 12 students accepted each year into the secondary mathematics education programs. The educational courses required of those accepted into the programs include topics of introduction to teaching, educational psychology, special education, instruction and management, classroom assessment, knowing and learning in mathematics education, classroom interactions, and instructional strategies for mathematics education. There is also a student teaching field experience and corresponding seminar.

Claire is quite fond of the educational course offerings of the institution, especially the introduction to teaching course for undergraduates that casts a wide net to recruit students potentially interested in teaching. Those interested in continuing in education enroll in Claire’s methods course that studies knowing and learning in mathematics education. In this course, prospective teachers discuss learning theories (e.g., argument-driven inquiry, behaviorism, constructivism, social constructivism), how students make sense of concepts, and student motivation (i.e., Carol Dweck’s work on mindsets). Prospective teachers are assigned activities that include developing a teaching philosophy, completing reading reflections, conducting clinical interviews, and designing lesson plans. Following this course, prospective teachers take Claire’s course on classroom interactions that looks at implementing lesson plans, examining discourse between teachers and students, and attending to equitable instruction. This course also has a field experience component that requires prospective teachers to observe and teach in a classroom for a few days.

When reviewing mathematics in Claire’s methods courses, she discusses the importance for her prospective teachers to consider the ways they present mathematical concepts:
We do talk about a lot of the ways your traditional classroom’s set up is that the procedures and the algorithms tend to come first along with the practice and then it gets applied to something. We talk a lot about how that needs to be flipped. We need to start from a basis of students already knowing certain things about math. We can either expect or find out if they know certain things about math and how it works in the real world. Here’s a context. Let’s explore the context, in terms of the math we know, the math we can utilize, and then let’s use that math to build another concept. (Interview 2, November 15, 2017)

Claire describes how this thinking is oftentimes challenging for her prospective teachers because they recall their past experiences learning about mathematics from practice focused on procedures and algorithms rather than a context. She models a different approach to prepare her prospective teachers for instruction that is student- and context-driven. She asserts, “That gets more into the realm of true problem-solving and true STEM thinking” (Interview 2, November 15, 2017).

**Participants from Small Private Institutions**

I selected three participants from small private institutions in Georgia to provide me with insight into the various ways secondary mathematics teacher educators respond to edTPA and professional organizations’ initiatives. Emily is the first participant introduced whose institution’s demographics are described as 82% White, 7% Hispanic, 5% Black, 1% Asian, and 5% other. Emily further describes the institution’s student enrollment as majority White, middle-class, traditional students who enroll in the institution immediately after high school. The second participant is Kevin whose institution’s demographics are described as 60% White, 20% Black, 8% Asian, 6% Hispanic, and 6% other. Given the mathematics education programs offered at his
institution, most prospective secondary mathematics teachers are enrolled as graduate students who are both part-time and full-time. The third participant is Sara whose institution’s demographics are similar to that of Kevin’s institution with 65% White, 26% Black, 5% Hispanic, 1% Asian, and 3% other. Comparable to Emily’s institution, the student enrollment at Sara’s institution is comprised of mainly traditional students. The described three participants from institutions of approximately 2,000 to 5,000 enrolled students provide me with a context to conduct further analysis.

Emily. Emily describes herself as a mathematics department chair and mathematics teacher educator who is responsible for preparing prospective mathematics teachers in grade-levels P–12. While at her institution for the last decade, she has closely worked with prospective secondary mathematics teachers instructing their courses, supervising field experiences, and designing curriculum that aligns with certification exams, which now includes the edTPA in addition to the Georgia Assessment for the Certification of Educators (GACE).

There are roughly 2 to 5 prospective secondary mathematics teachers in each cohort, which equates to an enrollment of 10 to 12 at any given point in the program. Prospective teachers enrolled in the program complete an undergraduate dual major in secondary education and mathematics. The education courses offered address topics of introduction to teacher education, educational psychology, exceptional learners, teaching English as a Second Language, diverse cultures, curriculum and methods for secondary education, instructional management, and educational research. The program also offers a year-long practicum and student teaching field experience. In the last year, the institution received funds to initiate a program for teaching in STEM. Prospective teachers are offered opportunities to be out in the surrounding schools and
interact with teachers at the start of their first year. The experience has encouraged recruitment to the STEM initial teacher preparation programs, which is a current focus of the institution.

When planning course curriculum for prospective secondary mathematics teachers, Emily incorporates several activities and NCTM-related publications. She structures her courses so prospective teachers are equipped with the pedagogy and mathematical content knowledge to be effective mathematics teachers. She says planning requires prospective teachers to—

Start with what is relevant and contextual to students, and then from that they build whatever necessary mathematics that they need…. You don’t start with the abstract mathematics and then try to fill the applications from that. It should be the other way around. (Interview 2, November 3, 2017)

She models this type of planning for her prospective teachers while simultaneously incorporating other assignments to prepare her prospective teachers for their edTPA.

Kevin. Kevin describes his position as a mathematics teacher educator of all levels (i.e., elementary, middle grades, and secondary). Although his institution has several campus locations, he is primarily located at one location. As a mathematics teacher educator at the institution for the last two decades, he has worked with various undergraduate and graduate-level prospective teachers. Currently, he works predominantly with graduate-level prospective teachers enrolled both part-time and full-time in the secondary education (STEM) program.

The program requires all prospective teachers, regardless of their content areas, to complete an initial field experience, a sequence of methods courses, a practicum, a student teaching field experience, and an electronic portfolio. The initial field experience provides an opportunity for prospective teachers to observe and assist students for a set number of hours at the beginning of the program. The intent behind the initial field experience is to recruit potential
prospective teachers and ensure that those interested in teaching confirm their desire before they continue progressing through the program.

As for the methods courses, prospective secondary mathematics teachers are required to take two mathematics-related methods courses, one that is general methods for mathematics teaching and another that targets geometry for middle and secondary education. There are other core courses in education that the prospective teachers must take in addition to the mathematics-related methods courses. Specific assignments from the program’s courses are compiled into an electronic portfolio, which is a requirement along with the edTPA for program completion.

Following the methods courses, the prospective teachers must complete a practicum experience that precedes their student teaching semester. During this experience, the prospective teachers spend 1 to 2 days a week in the classroom for a semester. The prospective teachers take on 5 full days of student teaching during their final semester of the program. If the prospective teacher is already teaching with a nonrenewable certificate, which is oftentimes the case, a mentor in the school acts as the cooperating teacher. Toward the end of the student teaching experience, the prospective teachers submit their edTPA.

Overall, Kevin describes the mission of his institution as one that focuses on the “transforming educator.” He says the institution encourages prospective teachers to “embrace transformation as a lifelong process, so while they are here with us, we hope they will be transformed in their beliefs about teaching and learning” (Interview 1, October 31, 2017). Furthermore, prospective teachers are encouraged to “focus on continual transformation throughout their careers and also nurture the embracement of transformation within the learners they work with” (Interview 1, October 31, 2017).
Kevin is a strong believer in the institution’s mission and makes sure he also considers transformation in his own work as a methods course instructor. Kevin makes intentional efforts to keep updated with the latest research in mathematics education and modifies his methods courses to reflect the current research. He notes, “Every time I teach a course again, I revise the syllabus” (Interview 1, October 31, 2017). He also incorporates various resources in his methods courses. He has his prospective teachers refer to websites (e.g., Georgiastandards.org, NCTM.org) to teach them about current standards and framework tasks. He selects textbooks that address progressive ways of teaching mathematics (e.g., best practices) and provides opportunities for his prospective teachers to work with various manipulatives (e.g., base-ten blocks, geoboards, tangrams, virtual).

Throughout his methods courses, Kevin communicates to prospective teachers that “there’s not one way to teach, and strong teachers build a varied repertoire of teaching strategies that they can use on their feet” (Interview 1, October 31, 2017). He says:

We might teach using one strategy one day and a different strategy the next day. We might change strategies even during one lesson, even something we had not originally planned to do because our intent is to reach the learners. (Interview 1, October 31, 2017)

Thus, he stresses the importance for his prospective teachers to recognize that there are many different types of learners, and it is the role of the teacher to be knowledgeable and skilled to know which teaching and learning strategies to adopt accordingly to best meet the needs of the learners.

Kevin also implements projects and problem-based opportunities in his methods courses. He believes in a problem-solving climate and incorporates projects that require problem-solving and critical thinking. He stresses the importance for his prospective teachers to embrace healthy
struggle as he sees it as an important part of learning: “If there’s no grappling or there’s no struggling, it’s not problem-solving. It’s just perhaps practice” (Interview 2, November 14, 2017). He also finds it important to integrate mathematics with other academic disciplines (e.g., literature, social studies) and relate mathematics to applications for purposes of introducing and reviewing mathematical concepts.

**Sara.** Sara describes her role at her institution as a secondary mathematics teacher educator and an assessment and accreditation director. She is responsible for planning program curriculum, evaluating program performance, and instructing and supervising prospective secondary mathematics teachers in their mathematics methods courses and seminars. She has been at the institution for approximately five years.

According to Sara, the mission of the institution’s education department is “creating learner-first oriented teachers” and “critical thinkers” (Interview 1, October 16, 2017). Approximately three to five prospective teachers are enrolled in the secondary education program with a concentration in mathematics; thus, the program is relatively small. The program requires the prospective secondary mathematics teachers to complete education courses that address teaching with diverse and exceptional learners, technology for the classroom, measurement and evaluation, mathematics and secondary education methods, and student teaching seminars and field experiences.

When preparing for class, Sara looks at the needs of her learners and instructs using the effective practices of a teacher that have been outlined by NCTM. She reviews pedagogy and pulls in content strands to review the mathematics. A large portion of her mathematics education methods course incorporates mathematics. She finds it important to model teaching the content so the prospective teachers can do the same in their future classrooms. She also interweaves
edTPA preparatory assignments in her courses to prepare her prospective teachers for the edTPA completed midway through their student teaching field experience.

Participants from HBCU Institutions

Two participants were selected from two HBCU institutions in Georgia. The first participant described is Bianca whose institution is identified as private and single-sex. The institution’s demographics are described as 97% Black and 3% other. The institution primarily consists of traditional students right out of high school seeking a degree from a baccalaureate college. The second participant is Maria whose institution is identified as public with demographics of 85% Black, 10% Hispanic, 4% White, and 1% other. Maria’s institution is also made up of primarily traditional students. Both institutions have approximately 3,000 undergraduate students enrolled. Next, I contextualize each participant at her institution to provide a background from which I conduct further analysis.

Bianca. Bianca describes her role at her institution as an edTPA coordinator and teacher educator who is responsible for teaching prospective secondary mathematics teachers as well as prospective teachers from other disciplines. She has been at the institution for a couple of years and has instructed prospective secondary mathematics teachers in several of the education courses and seminars. Her close work with the edTPA encouraged her to receive training as an edTPA evaluator. This experience coupled with her edTPA coordinator responsibilities enables her to lead local evaluation training with faculty members and closely work with prospective secondary mathematics teachers as they prepare and submit their edTPA.

The institution offers a bachelor’s initial teacher preparation for secondary education, where a concentration of mathematics can be pursued. Enrolled prospective secondary mathematics teachers begin their first orientation to education course in the second semester of
their sophomore year. Throughout the junior year, the prospective teachers take courses that address educational psychology, exceptional learners, and the curriculum and methods of teaching in secondary schools. The education courses have field experience components where prospective teachers have the opportunity to teach in the inner-city schools surrounding the institution, where students are 100% of minority ethnic backgrounds and receive free and reduced-priced meals. During the senior year, the prospective teachers enroll in a year-long student teaching seminar that coincides with their practicum and student teaching field experiences. At the end of the student teaching field experience, the prospective teachers submit their edTPA.

All of the education programs in the institution focus on minority teacher preparation. Common themes throughout the education courses include social justice, culturally responsive pedagogy, and advocacy for teachers. Bianca interweaves these themes into the courses she teaches. In preparing the curriculum for the courses, she uses research and evidence-based strategies. She also references resources and textbooks to ensure her prospective teachers are knowledgeable about effective teaching practices and ways to address mathematics content. When she connects mathematics with applications, she tends to start with real-world problems and builds the mathematics from there:

When you start off with a problem like flooding or you know, bridges falling, or just like some of those world crisis type things, and then they kind of brainstorm and come to some mathematical concepts that would support it, I just feel like that has been a little bit more meaningful. (Interview 2, November 16, 2017)

She also incorporates several key assignments and assessments throughout her courses to prepare her prospective teachers for success on the edTPA.
Maria. Maria describes her role at her institution as a secondary mathematics teacher educator, assessment coordinator, and interim chair. Her job responsibilities include instructing prospective secondary mathematics teachers in their mathematics methods courses, supervising them during their field experiences, and preparing them for the edTPA. She has been at the institution for approximately five years and is also a registered edTPA evaluator who completed the training to learn of the scoring requirements of the edTPA.

According to Maria, the mission of the institution’s education department is “preparing global, reflective, professional educators” (Interview 1, October 20, 2017). Thus, she asserts, “Our framework is aligned with student-centered assessment focus, integrated technology, and learning supports” (Interview 1, October 20, 2017). Prospective secondary mathematics teachers enrolled in the program, which are approximately three per cohort, are undergraduates and begin taking introductory education courses during their second year. During their third year, the prospective teachers take courses addressing the topics of educational psychology, exceptional learners, curriculum and assessment, and research methods in mathematics education. The fourth year is when they take methods courses in teaching mathematics and secondary education, which are accompanied by practicum and student teaching field experiences.

While the prospective teachers are enrolled in their methods courses, they complete edTPA preparatory assignments and a practice edTPA. Maria says, “This way we expose them and are able to provide them more feedback than we are able to during the actual submission” (Interview 1, October 20, 2017). In addition to submitting the edTPA, prospective teachers also complete a teaching portfolio assignment that requires them to assemble artifacts that have been completed throughout the program. This assignment mainly aids with collecting data for program accreditation and does not require prospective teachers to complete additional tasks.
As Maria plans for her methods courses, she uses textbooks and references NCTM journal articles. She incorporates student-centered activities to learn about hands-on teaching and research. The selected activities and assignments closely align with the tasks of the edTPA. She also has her prospective teachers practice mathematics using applications and problems to review the content.

**edTPA as a Catalyst for Eight Resonating Themes**

*Motivating Program Modifications*

According to the participants, the edTPA has been a catalyst for motivating program modifications at every institution. Although some institutions make more modifications than others, the edTPA is described as a predominant program focus that influences the redesign of program curricula, the addition of rehearsal edTPA practice (mock-edTPAs), and the development of edTPA-related programmatic support for prospective teachers. Some of the participants describe edTPA’s programmatic adoption as seamless given that their programs already prepare prospective teachers for planning, instruction, and assessment. Others describe their resistance and challenges when faced with an additional requirement to their initial teacher preparation programs. In the following sections, I share how the participants respond to the edTPA in their initial teacher preparation programs for secondary mathematics.

**edTPA as a predominant program focus.** Several of the participants share how the edTPA became a predominant focus in their institutions’ initial teacher preparation programs. Although many of the participants acknowledge that their programs already focused on preparing prospective teachers with adequate skills to effectively plan, instruct, and assess mathematics students, the added expectation of preparing prospective teachers for the edTPA forces some programs to reflect with the edTPA in mind. Others share that the focus of their programs did not
change in response to the edTPA; however, they discuss the various actions that have been taken to modify (and disregard) previous exit portfolios, tweak course syllabi, and reflect on the strengths and weaknesses of their programs with respect to the edTPA.

Although Bianca believes her institution’s initial teacher preparation program did a good job preparing effective prospective teachers before the edTPA, she notes, “It [edTPA] has a profound impact” on the current focus of the program (Interview 1, November 1, 2017). Faculty members in Bianca’s program see a benefit to “intentionally aligning it [edTPA] throughout the program” because doing so is “paramount for success” on the edTPA (Interview 1, November 1, 2017). By aligning the edTPA with the program, Bianca notices the following:

Providing quality feedback has been more of a focus than it probably was before. We focus on reteaching things to teacher candidates that they don’t master…. As a department it has helped us go back and really see that yes, we are covering these things but is it effective and to what extent? It also forces faculty to talk about things that we really wouldn’t have talked about before like academic language. (Interview 3, January 24, 2018)

However, Bianca describes how getting all faculty members on board with the edTPA has not been a smooth transition. As the edTPA coordinator, Bianca shares that she has had to convince faculty members that the edTPA was about good teaching: “A lot of people don’t like it [edTPA]. If I could just tell you how many disgruntled faculty members that I’ve had to coax, prod, massage, and exhort to buy into it” (Interview 1, November 1, 2017). Nevertheless, Bianca and her colleagues make an intentional effort to keep edTPA at the forefront of the program’s focus to best prepare their prospective teachers for the assessment.

Emily also shares how she believes the edTPA permeates her program:
There are some things that have drastically changed…. The edTPA, I think the parts that have been brought forward more, is definitely the very specific focus on conceptual understanding versus procedural fluency versus mathematical reasoning. Then also the language function and language demands, syntax. Yes, the discourse, all of that. We did not—I mean, we talked about communication and the importance of having students write and things like that in a math class, but we didn’t necessarily force them to put it in their lesson plans and things like that. (Interview 1, October 13, 2017)

Now, Emily and her colleagues focus on purposely addressing specific topics that come to the forefront of their program curricula because of edTPA’s focus.

Emily also states the edTPA is “prominently considered when we are talking about assessments that we’re going to have in our classes or things like that” (Interview 2, November 3, 2017). Before the edTPA, the program required prospective teachers to complete a capstone portfolio, but the capstone portfolio is now replaced with the edTPA. She believes the edTPA “pushes the students more than the portfolio system that we had before” (Interview 1, October 13, 2017); however, she also shares that she “missed the portfolio that students would create at the end of student teaching because there was some more personalization that happened with it. It was a nice reflective piece at the end of student teaching” (Interview 2, November 3, 2017).

Other participants discuss how they believe the edTPA did not change the focus of their programs despite programmatic decisions that encouraged the participants to modify program curriculum to include more edTPA preparation and participate in edTPA-related meetings. For instance, Kevin asserts, “I don’t think it [edTPA] has especially changed our overall focus because we were already focused on aspects incorporated into edTPA, such as differentiation, meeting the needs of learning, planning carefully, the importance of academic language, the
power of assessment, and using assessment results to make ourselves better teachers” (Interview 1, October 31, 2017). However, Kevin modifies program curricula to be more inclusive of edTPA-related practice: “edTPA has changed some of our syllabi and some of the nitty gritty of our courses because we have incorporated assignments that will help students practice and prepare specifically for edTPA” (Interview 1, October 31, 2017). He confirms that his program makes deliberate efforts to accommodate for the edTPA; however, he says: “We haven’t added entirely new content. We’ve just tweaked some of the content that was already there to be more edTPA preparatory specific” (Interview 1, October 31, 2017). Nevertheless, he believes the edTPA complements the program objectives.

Likewise, Claire claims the edTPA has not changed her program’s focus, but it has influenced what goes on in the institution’s initial teacher preparation programs. She asserts—

We incorporate prep for it [edTPA] in every program somewhere along the way. We ask them [prospective teachers] to work on a practice edTPA somewhere along the way…. We’ve completely rewritten courses to incorporate edTPA prep. We’ve looked at other assignments we’ve got and see where do they fit into the whole edTPA process. How can they be updated or changed a little bit to support edTPA? (Interview 1, October 30, 2017)

Thus, Claire recognizes that the edTPA is at the forefront of planning program initiatives. I would argue that her program’s modifications have contributed to an altered focus in her program similar to that of Kevin’s program.

Additionally, several of the participants share that they participate in meetings specifically held to discuss edTPA score reports, review sample submissions for their strengths and weaknesses, and plan what programmatic modifications might be necessary to increase future prospective teachers’ scores. Some of the meetings are held once a semester, whereas
others are held monthly. For instance, Anna mentions that she participates in monthly edTPA meetings. She says a great amount of time is spent to discuss and plan for the edTPA during these meetings because “if they [prospective teachers] are not passing the edTPA, then it looks poorly on our university” (Interview 1, October 25, 2017).

At Emily’s institution, she meets with the administration once a semester to address previous prospective teachers’ performance on the edTPA: “They will bring data from previous years and say, this is how your students did. This is it broken down by the different tasks and the different rubrics” (Interview 1, October 13, 2017). Sara and Claire also meet with their colleagues in their programs. At these meetings, Sara declares, “We talk about data all the time…. We look at it and see if we need to do program improvement or if it’s just something to point out to students for whenever they’re writing their assessment” (Interview 2, November 7, 2017). Similarly, Claire says, “We write our own growth goals around edTPA now” (Interview 1, October 30, 2017). Thus, the edTPA is a predominant focus in the participants’ programs, even to the point of influencing and altering some of the programs’ priorities.

I argue that when a high-stakes assessment takes center stage in teacher education, teacher educators must be mindful of the ways in which it influences the focus of teacher preparation programs. Despite teacher educators expressing confidence in their programs’ abilities to adequately prepare prospective secondary mathematics teachers prior to edTPA’s state-mandate, the edTPA’s targeted expectations and score reports force several teacher educators to reevaluate their programs’ strengths and weaknesses in terms of effectively preparing prospective teachers for the assessment. This response from teacher educators acknowledges the edTPA as an accountability tool to not only “measure” prospective teachers’ readiness to teach but also “measure” teacher preparation programs’ abilities to ready their
prospective teachers for success on the assessment. Thus, the assessment assumes power and control over the ways teacher preparation programs and those involved (e.g., prospective teachers, teacher educators) assess readiness to teach. As a result, the assessment’s power over teacher preparation programs perpetuates the need for prospective teachers and teacher educators to focus their efforts on preparing for the assessment. This need to focus on the edTPA appears in teacher preparation programs redesigning program curricula to align with the edTPA, adding rehearsal edTPA practice (mock-edTPAs) to their methods and practicum courses, and developing edTPA-related programmatic support for prospective teachers.

**Redesigning program curricula.** In response to programs focusing on edTPA preparation and data results, several program coordinators and teacher educators share how they have had to consider (some more than others) the redesign of their programs’ curricula to adhere to edTPA’s “proceduralized” process of teaching. In most cases, the participants map the edTPA to their programs’ courses to ensure that prospective teachers have ample exposure to edTPA’s tasks and expectations. The curriculum map serves as artifactual evidence that programs provide prospective teachers with adequate opportunities to prepare for the edTPA. Additionally, the curriculum map identifies areas where program curricula improvements can be made.

For example, Bianca communicates that she works with her faculty members as the edTPA coordinator to chart edTPA practice from the beginning of the prospective teachers’ programs. To ensure the various aspects of the edTPA are reviewed, she maps “at least three practices that [are] part of our key assignments or key assessments in our curriculum prior to their senior year” (Interview 1, November 1, 2017). As the prospective teachers reach the end of their program, Bianca shows them “the curriculum map of how we really intentionally map the classes and the assignments across the curriculum so that it’s not like this is a surprise”
(Interview 2, November 16, 2017). She states: “I do spend a great deal of time at the beginning of their senior year and actually go through the curriculum map and say, ‘You remember this assignment? Yeah, that’s Task 2. You remember this assignment? Yeah, that’s Task 1’” (Interview 1, November 1, 2017). Thus, the prospective teachers are aware of what purposeful planning has gone into the design and organization of the program curricula.

On a similar note, Sara describes how she works to reformat her course curriculum to align activities with edTPA tasks. Although she initially did not want to, Sara shares how she tweaked some assignments because her prospective teachers had trouble seeing the connection between the course activities and edTPA preparation. Her prospective teachers expressed their concerns and desires to see more “mapped edTPA practice” in an end-of-course survey. Thus, Sara’s course syllabi states which activities are aligned to specific edTPA tasks.

The administration overseeing the education department at Patrick’s institution requires programs to create early experience opportunities to assist with practicing the planning, instruction, and assessment tasks of the edTPA during each program’s methods courses. To comply with the request, the faculty members of Patrick’s program meet to create edTPA equivalent assignments that address the prompts and rubrics of edTPA’s tasks. The assignments are then placed in respective methods courses that address the concepts of each task.

Claire’s program also aligns specific edTPA tasks with course curricula. For example, in the learning theories course, Claire reviews edTPA’s Task 1 given that the course addresses lesson planning. In the classroom interactions course, Claire reviews edTPA’s Task 2 because the course offers an opportunity for prospective teachers to teach a lesson, reflect on the classroom environment, and study the discourse between teachers and students. An assessment
course not taught by Claire addresses edTPA’s Task 3. In the two courses taught by Claire, she says—

We don’t bring edTPA up until somewhere between halfway to two-thirds through the course, and that’s when it kind of takes over the course…. When the assignments to practice edTPA come out, we start linking them back to ideas we’ve already covered. (Interview 2, November 15, 2017)

Several other participants share how the edTPA is interwoven into their programs’ curricula; however, Heather expresses how her program does very little to modify for the edTPA. Heather asserts: “We have not drastically changed our program because we feel like it’s good…. Although I don’t I think it’s [edTPA’s] a valid measure, our test scores bear it out. Our students are doing fine without any additional edTPA prep” (Interview 1, October 23, 2017). Initially when the edTPA was in its pilot stage for the first year, Heather met with her colleagues from various secondary education programs to begin mapping ways to insert the edTPA into the programs’ curricula. After the panic settled, the rallied committee realized that the prospective teachers should be able to successfully complete the edTPA with what already existed in the programs. She says:

This does not mean we ignore edTPA. We have used things like looking at how our students are scoring to beef up, for instance, our focus on differentiation in the second course. We do occasionally try to use some of the vocabulary that’s in edTPA because edTPA uses vocabulary that is not the standard mathematics education vocabulary. (Interview 1, October 23, 2017)

However, when it comes to modifying curricula with edTPA preparatory assignments, she declares, “As a program we’ve put our foot down and said, ‘Well, Georgia can require this
assessment, but that doesn’t mean we have to change what we do in our classes”’ (Interview 1, October 23, 2017). She says the faculty members’ reactions could be in part because “all of us are pretty stubborn” (Interview 1, October 23, 2017), but they are also confident that their programs at the institution adequately prepare prospective teachers for teacher certification without the added requirement of the edTPA. The faculty members still review the prospective teachers’ scores and adjust discussion topics in the methods courses, but the prospective teachers do not complete assignments specifically designed to review edTPA tasks, including the prompts and the rubrics. The student teaching seminar is the only time when prospective teachers briefly review edTPA expectations while they are simultaneously completing their portfolio assessment. Heather remarks, “We just help our students to figure it out in their final semester, as opposed to letting it take over our lives and program and their lives” (Interview 2, November 6, 2017).

As efforts (some more than others) are made by program coordinators and teacher educators to redesign program curricula to adhere to edTPA’s “proceduralized” process of teaching, I caution that teacher preparation programs should be aware of the ways in which the edTPA permeates their preparation plans. When a curriculum map is used to intentionally “map edTPA practice,” the assessment, as previously discussed, assumes power in deeming what is vital to include in teacher preparation programs. While some good may come out of teacher preparation programs revamping program curricula to ensure they are addressing targeted “good” teaching practices as defined by the edTPA, I warn that program improvements based on prospective teachers’ edTPA performance may in fact miscommunicate the “what” and the “who” are of importance in teacher education. The “what” draws attention to prioritizing the content and expectations of the edTPA, while the “who” is focused on the assessment. Thus, the edTPA becomes a top-down, one-size-fits-all assessment where teacher educators and
prospective teachers must confine to the assessment rather than use the assessment as a way to showcase their strengths in teacher education.

**Adding rehearsal edTPA practice.** Most of the participants also address how their initial teacher preparation programs have added rehearsal edTPA practice (mock-edTPAs) that often equates to prospective teachers completing an entire practice edTPA prior to their student teaching field experience. For instance, Claire’s prospective secondary mathematics teachers complete a practice edTPA throughout their methods courses. She shares that a practice Task 1 is completed in the first methods course, while Task 2 and Task 3 follow in the remaining methods courses, in their respective order. In a similar manner, Kevin, Patrick, and Anna’s programs incorporate practice edTPA tasks in their methods courses, where different tasks are reviewed in courses addressing similar topics.

Sara also addresses the edTPA tasks with her prospective teachers but in a unique manner. She has her prospective teachers complete a sample edTPA in the order of Task 3, Task 2, and Task 1. She says this sequencing allows her prospective teachers to plan with the end in mind, which is a planning strategy she discusses in her methods courses. Although she recognizes that the order of the practice tasks may not lead to a cohesive portfolio, beginning with Task 3 allows her to discuss with her prospective teachers what is needed from the previous tasks to adequately prepare for Task 3. She is hopeful that this newly implemented practice design will improve the previously received lower scores in edTPA’s Task 3.

In addition to exposing prospective teachers to edTPA preparatory assignments in their methods courses, Bianca, Maria, and Emily’s programs require prospective teachers to complete an entire practice edTPA during their practicum seminars and field experiences. Some of the participants even use edTPA rubrics to evaluate the practice edTPA. For example, Maria says, “I
use the same rubrics. I’m a national evaluator, so I know how to interpret their rubrics and specifically what to ask them [the prospective teachers]” (Interview 2, November 20, 2017).

In all cases, the participants describe how setting aside time during their methods courses, seminars, and practicum field experiences to practice rehearsal edTPA tasks is two-fold. On one hand, the review allows prospective teachers to familiarize themselves with the expectations, including the prompts and rubrics. They can preview the amount of work that is needed to complete each task and plan accordingly during their student teaching field experiences. They also receive feedback from their instructors. On the other hand, the time taken to incorporate a rehearsal edTPA can add to the stress and workload centered around the edTPA for both the teacher educator and prospective teacher. Patrick says, “I think that’s a huge invasion on our time, and I think it adds to the students’ stress about being successful on the edTPA” (Interview 1, October 18, 2017).

Heather shares a similar concern to that of Patrick’s reservations about a rehearsal edTPA. She sees the edTPA as something the prospective teachers are responsible for and not the program. Thus, Heather and her colleagues in the mathematics education program “pretty much keep edTPA at arm’s length” (Interview 1, October 23, 2017). She says this action is in part because “we don’t want to teach to the test. We teach our students not to teach to the test” (Interview 1, October 23, 2017). Therefore, the program does not have prospective teachers complete a practice edTPA. She states, “We thought about it and then we decided that it would take up too much of our time that would be more profitably spent actually engaging in learning about teaching” (Interview 1, October 23, 2017).

I argue that teacher preparation programs that add rehearsal edTPA practice (mock-edTPAs) in their methods and practicum courses do so because they want to adequately prepare
their prospective teachers for success on the assessment; however, the addition of such practice may also reveal the fear behind prospective teachers not being fully equipped with the specific skills to do well on the assessment. I acknowledge this fear to highlight that the assessment is complex in that prospective teachers must be knowledgeable about the assessment’s many layers, which include content, technological, and logistical expectations. Given the high-stakes nature of the assessment, teacher preparation programs and prospective teachers rely on one another to review the assessment’s expectations; however, the varying support offered to prospective teachers may result in some prospective teachers advantaged over others due in part by program modifications to include specific support structures (e.g., rehearsal edTPA practice).

*Developing edTPA-related programmatic support for prospective teachers.* When prospective teachers are in their student teaching field experiences, several participants and their programs offer the prospective teachers various support and management opportunities to assist with completing the edTPA. Support opportunities come in the form of Saturday bootcamps, evening work sessions, excused time from student teaching, and built-in time during student teaching seminars to work on the edTPA. The type of support includes reviewing the handbook and other supplemental materials, answering technological and logistical questions, and providing workspace for prospective teachers to give one another feedback.

For example, Kevin’s program offers Saturday bootcamp sessions for prospective teachers to review edTPA’s handbook and supplemental materials, collaborate with peers to review sample portfolios, and give peer-to-peer feedback on material prepared for the edTPA. The Saturday bootcamp sessions are in addition to what is reviewed during program curricula regarding the edTPA. Kevin says the prospective teachers are receptive to the additional support,
especially when they are in the throes of completing the real edTPA and looking for technical and logistical support.

Similarly, Anna’s program offers edTPA bootcamps during the student teaching field experience semester. She says the program allows prospective teachers to miss student teaching several Fridays throughout the semester to give prospective teachers time to work on their edTPA and answer technical and logistical questions. Anna expresses concern for her prospective teachers being pulled out of their placements to work on the edTPA: “They’re given the time to manage it, but then they’re also not in the classroom or they’re missing instruction in the classroom” (Interview 2, November 1, 2017). Thus, making the edTPA more manageable for the prospective teachers has also impacted the amount of time prospective teachers could be in their student teaching placement.

In Maria’s case, she offers support sessions during the evenings for her prospective teachers. Her prospective teachers also have a seminar each Friday, where time is built into the seminar for prospective teachers to work on their edTPA. The first two weeks of the seminar are focused on prospective teachers readying their materials for Task 1. The following two weeks are focused on Task 2, and the next two weeks address Task 3. The pace of the seminar also encourages prospective teachers to stay on track with gathering and writing material for each task.

Heather’s program offers edTPA support for the first time during the prospective teachers’ student teaching semester. The prospective teachers enroll in a required student teaching seminar that reflects on the student teaching field experience. The seminar also reviews each edTPA task right as the prospective teachers prepare their materials. Some time is also built into the course schedule so prospective teachers can work on the edTPA and give each other
feedback. In addition to the support in the seminar, the institution offers walk-in sessions for edTPA technical help on a weekly basis. In particular, the sessions provide assistance with cutting and compressing videos as well as uploading the final documents to the submission platform.

In addition to the prospective teachers receiving support as they complete their edTPA, several participants also describe how their programs provide management plans to aid with pacing. For instance, Bianca provides her prospective teachers with a timeline suggesting deadlines on when to complete certain tasks. She also gives her prospective teachers writing organizers to assist with planning and structuring responses to the edTPA prompts. She finds the writing organizers to be helpful for her prospective teachers, especially those who struggle with writing.

In speaking with the teacher educators, I understand that teacher preparation programs offer various support opportunities for prospective teachers as they complete the edTPA. I find the programmatic support to be encouraging in that prospective teachers can seek assistance from their teacher educators and peers while they prepare for the assessment. Additionally, prospective teachers receive access to resources that can assist with organization and management. Although intentional efforts are made to offer prospective teachers opportunities to prepare and manage their assessment, I am concerned that the support can distract from prospective teachers’ student teaching field experiences (e.g., excused time from student teaching). Thus, support may emphasize (and de-emphasize) other aspects of the student teaching field experience. Teacher education must consider the ramifications of such programmatic support and recognize how various support opportunities can advantage some prospective teachers with time and resources that may not be accessible to others.
**Accommodating edTPA Preparatory Assignments**

With the edTPA at the forefront of initial teacher preparation programs, the participants share the various ways edTPA preparatory assignments are embedded in their methods courses, seminars, and field experiences. In most cases, the participants discuss SCALE’s (2016a) *edTPA Secondary Mathematics Assessment Handbook* and other supplemental materials as required readings or references to aid with course assignments. However, the participants also describe their efforts to accommodate previous assignments with aspects of the edTPA to offer practice opportunities for their prospective secondary mathematics teachers. In the following sections, I discuss the various ways participants review edTPA resources with their prospective teachers and accommodate course assignments for preparatory purposes.

**Reviewing edTPA’s handbook and supplemental resources.** Efforts are made by all participants and their programs to ensure prospective secondary mathematics teachers are knowledgeable about SCALE’s (2016a) *edTPA Secondary Mathematics Assessment Handbook* and other supplemental materials. In some cases, the participants assign sections of the resources for prospective teachers to review as course assignments. Other times, the prospective teachers are asked to review the resources on their own or reference the resources as needed to complete edTPA-related assignments.

For instance, Kevin states, “We, faculty, I think discuss it [edTPA] in every single course that the students take, not just the methods courses” (Interview 1, October 31, 2017). As he reflects on his own efforts to address the edTPA in his methods courses, he shares that he has his prospective teachers read SCALE’s (2016a) *edTPA Secondary Mathematics Assessment Handbook* and SCALE’s (2016b) *Making Good Choices: A Support Guide for edTPA Candidates*. Prospective teachers review the *Making Good Choices* document on their own
because Kevin notes that there is not enough time in class to talk about every single aspect of the document. However, he does make time in his methods courses to briefly review the handbook’s prompts and rubrics: “I show them all of the rubrics, but I guess the ones that we discuss most heavily are the ones related to academic language and student-centered instruction” (Interview 1, October 31, 2017).

Similar to Kevin, Patrick and Sara have their prospective teachers review the edTPA handbook in their methods courses. As a request from Patrick’s administration, prospective teachers must read the handbook in the first methods course. He declares, “One of the things we do in the class on learning about learning is have them read the edTPA handbook,” which is the first time it is “baked into a class” (Interview 1, October 18, 2017). Sara also includes the handbook and Making Good Choices as required texts on her methods course syllabus. Thus, the edTPA resources are acknowledged as important class texts, even so much that in Emily’s institution some faculty members have “gone so far as to even have T-shirts made up that say, ‘Read the Handbook’ because they probably feel like they’re saying all the time, that answer’s in the handbook. Look at the handbook” (Interview 1, October 13, 2017).

Although some participants do not assign edTPA-related resources as required readings, there is expectation that prospective teachers review the resources to complete course assignments. For example, Maria and Bianca use the edTPA prompts and rubrics in their methods courses so that the prospective teachers become familiar with the expectations and do not feel overwhelmed with having to review the resources for the first time while completing their practice edTPA. Bianca asserts, “I kind of spoon feed it [edTPA resources]” (Interview 1, November 1, 2017).
In a similar manner, Claire shares how she references the handbook in class discussion, especially in the last third of each class that is dedicated to familiarizing prospective teachers with the edTPA. She says, “It [edTPA handbook] basically goes everywhere with me” (Interview 1, October 30, 2017), and she hopes the same is for her prospective teachers. To familiarize her prospective teachers with the handbook, she has them complete an edTPA scavenger hunt. With this activity, she discloses:

I’m asking them to spend a lot of time with this book because there’s no way you’re really conquering edTPA if the book is frightening. Part of what I’m trying to do with those initial assignments is just—you can just turn the pages. You can just look for things. It’s okay just to spend some time with the book. It’s a weird assignment because it’s really low-level. The only goal of that assignment is just to get them to be willing to just simply open the book because the urge would be to just put it aside until however many weeks before you have to submit an edTPA and convince yourself you can just digest it then. (Interview 2, November 15, 2017)

Thus, Claire’s prospective teachers are encouraged to review the handbook and learn of the edTPA’s expectations.

As evident from the participants, SCALE’s edTPA handbook and other supplemental material appear as important (and required) readings in methods courses. The teacher educators believe they have a responsibility to make prospective teachers aware of the resources, even to a point of having to “spoon feed it” and assign activities to familiarize prospective teachers with the material. I acknowledge that teacher educators include and reference edTPA’s resources because they want their prospective teachers to be knowledgeable about the assessment’s multifaceted expectations. While I recognize the support as helpful, I am also cautious of such
activities stifling other assignments and readings that could be addressed instead to assist prospective teachers in developing other knowledge vital to teaching.

*Adapting assignments with edTPA practice.* In addition to reviewing SCALE’s edTPA handbook and supplemental readings, the participants also share their experiences adapting assignments with edTPA-related practice to ready their prospective secondary mathematics teachers for the edTPA. Some participants incorporate edTPA preparatory assignments into their courses that match (or closely match) edTPA’s Context for Learning and the tasks’ commentary prompts. Several participants and their programs have also redesigned lesson plan templates to meet the requests of the edTPA. As the participants share their rationales for incorporating edTPA preparatory assignments, most disclose that they purposefully incorporate various requirements of the edTPA to familiarize their prospective teachers with the expectations. They also want to provide feedback that alludes to edTPA’s rubrics so that the prospective teachers can prepare themselves for success on the assessment. Next, I describe various assignments that have been intentionally adapted with edTPA-related practice.

As Patrick reflects on his methods course, he states: “We have a couple assignments that are meant to almost be mini edTPA assignments. More or less they plan. They videotape themselves… Then, there’s one that’s focused on assessment. We have those sort of structural practices” (Interview 2, November 1, 2017). To practice planning, Patrick has his prospective teachers write a 3-day lesson segment. The prospective teachers then have an opportunity to teach their lesson segment, which is video recorded. Afterwards, the prospective teachers are asked to critique their instruction. The entire 3-day lesson segment is designed and scored with edTPA’s criteria in mind. Additionally, his prospective teachers complete another activity where they identify elements of edTPA’s Context for Learning. As the prospective teachers write about
their students, he also has them complete a funds of knowledge piece. He wants his prospective teachers to focus on different ways of approaching a lesson plan, one that is not focused on students’ misconceptions but rather on their assets. Although he incorporates edTPA practice in his assignments, he notes, “I’m very intentional on focusing on good teaching over focusing on edTPA prep” (Interview 2, November 1, 2017).

Kevin purposefully incorporates edTPA preparatory assignments that review all three of edTPA’s tasks. He has his prospective teachers complete a 2-day connected learning segment assignment that is modeled after edTPA task expectations. In the assignment, prospective teachers must compile a “context for learning,” two lesson plans, and a reflective commentary. The descriptors describing the context for learning and the reflective commentary align with the prompts of edTPA’s Context for Learning and Task 1: Planning Commentary. He claims, “We developed that whole template for the 2-day connected learning segment to give candidates opportunities to explore some of the expectations they’ll see when they get to edTPA” (Interview 2, November 14, 2017). When asked if the assignment existed before the edTPA, he states that it did exist, but “it has been tweaked in the recent past by a committee of faculty to more deliberately reflect edTPA language and help students think forwardly about edTPA” (Interview 2, November 14, 2017).

Kevin also has his prospective teachers complete a video critique assignment, which reviews edTPA’s Task 2: Instruction. The prospective teachers video themselves teaching a lesson and answer reflective questions about their instructional decisions. More specifically, they reflect on communication skills by analyzing both teacher and student actions (e.g., attentiveness, body language, comments, facial expressions, movement around the room, questions). They also reflect on the developmental appropriateness of the lesson, the selected
modes of teaching (e.g., direct instruction, inductive inquiry), classroom management, and the overall effectiveness of the lesson. The assignment allows the prospective teachers to reflect on their teaching strengths and challenges as well as practice videotaping while instructing a lesson.

Additionally, Kevin gives an analysis assignment in which prospective teachers distribute an assessment to their learners. Then they complete reflective commentary that addresses student feedback and how the results of the assessment are used to develop re-teaching plans. When compared with the edTPA, this assignment aligns with the prompts of edTPA’s Task 3: Assessment Commentary. He notes:

Those particular assignments were not exactly in my courses prior to edTPA. There may be similar type assignments, but now I must confess that they are designed specifically to help students with edTPA. I think helping them prepare for edTPA will also help them be stronger teachers in general. (Interview 1, October 31, 2017)

Similar to Patrick and Kevin, Bianca’s program has her prospective secondary mathematics teachers complete “three to five learning segments throughout [the] program, so that they can really practice looking at deepening student understanding” (Interview 1, November 1, 2017). One of the learning segments addresses a differentiated lesson plan in which the prospective teachers must plan for three students with learning exceptionalities. The lesson plan template associated with the assignment is aligned with edTPA expectations. Bianca gives her prospective teachers feedback on the assignment through the lens of an edTPA scorer: “I tend to give them feedback in reference to where they’re weakest at or just corrected feedback on what I feel like they did a great job in and what types of things can make it a lot stronger” (Interview 2, November 16, 2017). She also finds time in her course to invite peers who previously submitted the edTPA to meet with her prospective teachers: “Our previous candidates
come back [and] give their testimonials. We look at previous candidates’ submissions and talk about the strengths, weaknesses, and the challenges” (Interview 1, November 1, 2017).

Maria acknowledges that the edTPA is “a very rigorous assignment” (Interview 1, October 20, 2017) so she makes intentional efforts to plan ways to support her prospective teachers during her methods courses. From her analysis of previous prospective teachers’ scores on the edTPA, she realized that Task 2 was more of a challenge over the other tasks. Thus, Maria now implements targeted activities in hopes of improving her prospective teachers’ instructional practices. For example, Maria has her prospective teachers complete a peer microteaching activity where peers critique one another’s instruction. The lessons are also video recorded for the prospective teachers to review and reflect. Additionally, she assigns her prospective teachers a video reflection that mirrors the prompts of Task 2. The prospective teachers review a 40-minute video of a mathematics class and write about the classroom environment. In their reflection, they analyze teacher actions and classroom discourse. She says the activity allows the prospective teachers to reflect like an edTPA evaluator. Next year, Maria plans to use a video software system that will allow prospective teachers to upload their video clips and enable them to analyze their instruction at specific timestamps. She believes the video software system will assist the prospective teachers as they complete the commentary portion of Task 2.

In Sara’s case, she has her prospective teachers complete various edTPA preparatory assignments aligned to edTPA’s tasks. With respect to planning, she has her prospective teachers complete a cultural community and student asset table. This table helps her prospective teachers think about edTPA’s Context for Learning and how to use the knowledge of their students to inform their teaching when completing Task 1. To review edTPA’s Task 2 expectations, Sara assigns a similar assignment to Maria in that she has her prospective teachers watch videos of
teachers online and reflect on what is going on in the classroom. Following this activity, the prospective teachers video themselves teaching a lesson. They write about their classroom environment and score themselves using Task 2’s rubrics. For edTPA’s Task 3, she states:

One example activity I do is I have them collect an assessment or create an assessment…. They bring the assessment and the set of data. I have them go ahead and analyze it in Excel. We look at trends. Then figure out what the objectives would be on the top. What did this address? How they would grade it. Maybe if they were using a rubric or something else. Then I have them look at Task 3 and try and go ahead and answer—they don’t have to write out but just jot some notes down. We come back. We have a discussion. (Interview 1, October 16, 2017)

In all of the assignments, Sara’s prospective teachers work to some extent preparing for aspects of the edTPA.

Emily also purposefully adapts her course assignments to the edTPA. She reveals that she “pull[s] pieces out of the edTPA, especially at the junior level, that they [prospective teachers] have historically struggled with, seeing the connections and making that part of assignments now” (Interview 1, October 13, 2017). Typically, she does not have her prospective teachers work on the tasks in their entirety until their practice edTPA during their practicum. In her methods courses, she notes: “Mostly what I do is pull out specific ones. I’ll tell them, this is an edTPA prompt, and so we’re practicing making sure you address this, this, and this” (Interview 1, October 13, 2017).

Furthermore, Emily assigns her prospective teachers a diagnostic interview activity. As a follow-up to their interview with a student, the prospective teachers answer similar prompts
found in edTPA’s commentaries. She also assigns a lesson study assignment where the prospective teachers work in pairs to create, teach, and revise a lesson plan. She states:

The partners would each pick something that in their separate student teaching placements they would both be covering. They created a lesson. Then one of them would teach it while the other one went and observed in their classroom…. Then they would sit down afterward and revise it. Then the second person would teach it. Then they would sit down and reflect on it afterwards. It was a process where they got to see it taught in different locations but the same lesson, and they were both part of the revision process.

(Interview 2, November 3, 2017)

The commentary piece of the lesson study assignment requires the prospective teachers to answer various prompts pulled from the commentaries of edTPA’s tasks. Emily assesses the assignment using the corresponding edTPA rubrics for the prompts.

Anna’s prospective teachers also complete edTPA preparatory assignments to review all three of edTPA’s tasks. In Anna’s methods course, she prepares her prospective teachers for edTPA’s Context for Learning, Task 1, and Task 2. Task 3 of the edTPA is discussed in the course on assessment. To review the expectations for edTPA’s Context for Learning, Anna uses a context for learning assignment to generate conversations about students’ characteristics as diverse learners and the ways planning must support varied students’ learning needs. A program initiated expectation is for prospective teachers to plan a mini-unit with 10 days of consecutive lessons. While Anna’s prospective teachers plan their lessons, they review the difference between conceptual understanding, procedural fluency, and mathematical reasoning and problem-solving skills (see Figure 3). She states, “We have them write their 10-day unit and then go through and highlight which lessons are conceptual, which ones are fluency, which ones are
problem-solving and reasoning so that they can see the progression for themselves” (Interview 1, October 25, 2017).

Figure 3: Targeted edTPA Practice. Reviewing the difference between conceptual understanding, procedural fluency, and mathematical reasoning and problem-solving skills in preparation for the edTPA.

To prepare for edTPA’s Task 2, Anna’s prospective teachers complete a classroom observation reflection activity. The activity requires them to observe their cooperating teachers’ interactions with students and assess the discourse and classroom environment. She believes the practice of observing and critiquing their cooperating teachers with Task 2 in mind will prepare them to assess themselves for the edTPA. Although Anna does not teach the assessment course, she is aware that the prospective teachers complete a mini-Task 3 assignment. For this assignment, the prospective teachers gather data from a lesson they taught and complete individual and whole-class analyses.

Similar to the other participants, Claire notes how she has had to purposefully think of ways to adapt her course assignments to ready her prospective teachers for the edTPA:

Assignments I brought with me from before, I'll lay them out and I'll look at them in terms of these [edTPA’s] rubrics now. I’ll look and see if I need to change the assignment
a little bit or tweak my language to be more in line with what I know they’re going to be focused on here. (Interview 1, October 30, 2017)

For instance, Claire assigns her prospective teachers clinical interviews that she implemented at her previous institution. The clinical interviews allow prospective teachers to interact with students and learn of their prior mathematical knowledge as well as their personal, cultural, and community assets. Following the interviews, Claire has her prospective teachers apply their learned insight to create a lesson plan with the students and edTPA in mind:

As they’re creating the lesson plan, they’re going back and forth between the rubric and the planning commentary trying to figure out, “What will I say about this in the planning commentary when I get to it? What parts of the rubric show up on my lesson plan? What parts show up on the commentary? How am I going to make it clear that I’m doing what the rubrics are asking me to do?” (Interview 1, October 30, 2017)

She then has her prospective teachers complete edTPA’s Task 1 commentary for practice. She also has her prospective teachers choose a 10-minute video clip where they practice writing the commentary portion of Task 2.

In both assignments, Claire uses the corresponding edTPA rubrics to assign grades. She notes:

If I’m giving students mostly scores of—I see it as a three [or] could be a four if…I would go ahead and score that part of it as an A. If I’m seeing ones to twos, I would score it as a B. If I’m seeing things solidly in the ones or I feel like I can’t get it on the rubric, that’s when they score C’s from me. I’m trying to put those together, and give them something reasonable because I realized I can’t expect them to score fours and fives at this point. They’re just overwhelmed by the documents, and they’re not even dealing
with a full set of the documents. They’re just dealing with a cut-down version. Yeah, I try to not be ridiculous in how I associate my grades and scores. (Interview 2, November 15, 2017)

Claire’s statements indicate that she is not only tailoring assignments with edTPA-related preparation, but she is also using edTPA’s rubrics for feedback and grade purposes.

In summary, most of the teacher educators make intentional efforts to accommodate course assignments with targeted edTPA practice. The redesign of course assignments can be two-fold. On the one hand, teacher educators may find themselves improving assignments with deliberate practice that emphasizes “good” teaching practices. I attribute this response as a beneficial outcome of the edTPA. However, on the other hand, adaptations to course assignments with continual reference to the edTPA may miscommunicate that doing such practice is to prepare for the edTPA rather than to prepare for good teaching. A look at the context in which the assessment is situated can contribute to an understanding of what is communicated about why such teaching practices are learned and in what manners. With a high-stakes assessment, I contend that the context is politically charged and, as a result, teacher educators feel it is their duty to prepare good teachers for the classroom as well as teachers who are successful on the edTPA, which is reflected in their implemented edTPA preparatory assignments.

**Altering Awareness and Discourse in Teacher Preparation**

The edTPA is also described by the participants as a catalyst for altering the teacher educators’ awareness and discourse in teacher preparation. Some participants attribute the edTPA to refocusing their teaching practices. Although most of the participants share that they believed they adequately prepared prospective teachers to be effective future mathematics teachers before the edTPA, they acknowledge that the edTPA has helped to illuminate their
strengths and areas for improvement (e.g., academic language, assessment, feedback). The participants also share how the edTPA has infiltrated into the discourse of their teacher preparation programs. For the most part the discourse is not described as a negative impact; however, the idea that a high-stakes assessment can influence course discussion and curricula highlights the dominating power of such an assessment tool. In the following sections, I discuss the various ways the participants are personally influenced by the edTPA.

**Refocusing teacher educators’ teaching practices.** Several of the participants acknowledge that the edTPA has encouraged them to refocus their teaching practices so that they appropriately model and address what is deemed “good” teaching. Although most of the participants disclose that they believed they did a good job discussing planning, instruction, and assessment prior to the edTPA, they express how the edTPA has helped them “proceduralize” the process in their instruction. They also discuss the various ways edTPA assisted with identifying areas for growth in their methods courses.

For instance, Kevin notes that the edTPA raised awareness of the way he addressed assessment when preparing prospective teachers to gather and use data to analyze their students’ misconceptions and guide improvements in their future teaching:

> Of course, I have always known that it [assessment] is important, but as a professor I don’t think I deliberately included enough assignments in the course that gave my own students really healthy practice with that, such as looking at student work from formative and summative assessments and analyzing the gathered data to find better ways to teach. (Interview 3, January 5, 2018)

Thus, Kevin makes intentional efforts now to address assessment in a way that he may not have prior to the edTPA.
To Patrick, the edTPA gives him a framework to present the concept of teaching in terms of planning, instruction, and assessment. He states, “Granted I’m sure I was thinking that way, but the edTPA forces that framework even further” (Interview 3, January 9, 2018). He also attributes the edTPA to bringing more awareness to feedback—“I’ve become more focused on being thoughtful about helping them [prospective teachers] think about the feedback they give and being able to do it in a timely effective way” (Interview 1, October 18, 2017). Although he acknowledges his increased attention to the feedback his prospective teachers give, he also reflects on his own feedback and the driving force behind it:

I spend a lot of time giving feedback in response to edTPA rubrics instead of in response to good teaching…. Yet I know my students need to jump through this hoop, so I try to make sure they are able to jump through. (Interview 1, October 18, 2017)

Similar to Patrick, Sara notes that the edTPA encourages her to be intentional with the feedback she gives to her prospective teachers:

I think what it has taught me is that they [prospective teachers] are not really reflecting on their own practice at the depth I thought they were. Without the outside accountability, I would read something and have a conversation with someone and let it go. Now, it’s more I need to know that you didn’t address this and I need to know can you. (Interview 3, January 23, 2018)

Sara is mindful that others will assess her prospective teachers. Thus, she wants to make sure her prospective teachers know how to communicate their ideas. She also says, “I don’t think I emphasized academic language in the specificity that the edTPA does” (Interview 3, January 23, 2018). Therefore, Sara tries to refocus the way she addresses academic language with her prospective teachers.
As Sara reflects on the way edTPA makes her rethink some concepts and teaching practices, she also notes her concern for the edTPA impacting the way she teaches her courses. She asserts, “There’s some teaching to the test” (Interview 2, November 7, 2017) because of the uniqueness of the assessment. She feels as through the content is still the same, but the way prospective teachers must work with the content in a rigid structure requires her to also prepare them for the requirements:

It’s just how we have to teach it…. Now, it’s not just that we’re teaching those concepts and skills, [but] it’s that we’re teaching how to also do well on the portfolio. How to answer the questions in a way that the understanding rubric level progressions would then match. (Interview 1, October 16, 2017)

Reminiscent of Sara’s increased awareness of feedback, Claire also mentions how she makes sure her prospective teachers are able to communicate their ideas through their writings—

I don’t necessarily look at a written response to an article now as an opportunity for a person to only explore the research that’s out there and relate it back to me and try to synthesize it with some other research…. Now, I’m looking more for the ability to communicate because I know someone else is going to read the student’s writing who doesn’t know the student. I know the student. I have conversations with them every class period. If they write something and it’s written a little awkwardly, I understand what they’re saying. In the past, I would’ve had more of a tendency to work with what I could read. Now, I make comments on that. I have a lot more of a tendency now to make comments on what’s not written clearly or what’s not tied back to the article very well. If they find something in an article and I believe they’ve misinterpreted it, I’m a lot more likely to say, “Can you go back and take a look at that again because I’m not sure you
supported your argument well?” That’s all due to edTPA because now I realize other people that don’t know them are going to be trying to understand them through their writing. (Interview 1, October 30, 2017)

Thus, the added pressure of knowing outside evaluators will assess Claire’s prospective teachers encourages her to reconsider her own feedback to her prospective teachers.

The participants acknowledge that the edTPA has influenced them to refocus their teaching practices with respect to academic language, assessment, and feedback. Although the participants recognize that “good” teaching practices depicted in the edTPA are nothing new, the way the edTPA reconfigures such practices into an assessment reaffirms certain expectations of their own preparation. I argue that the “refocusing” is not a bad thing; however, if teacher educators end up “teaching to the test,” certain practices not stressed on the edTPA will fall to the wayside. Thus, the edTPA can simultaneously reinforce and de-emphasize certain agendas.

**edTPA discourse.** The participants say that edTPA discourse is consistently used by faculty members and prospective teachers and, as a result, permeates program curricula. Some participants “fight” the discourse because they feel the edTPA is not necessary to communicate their programs’ objectives. Others feel as if they have no choice but to use the language of the edTPA to best prepare their prospective teachers for the assessment. Next, I discuss what the participants share about edTPA in the discourse of their teacher preparation programs.

When asked about the edTPA, Patrick replies, “You would think there was nothing else” (Interview 1, October 18, 2017). He shares his concern that the edTPA has dominated the discourse of his program. Furthermore, he says, “Basically the edTPA is the discourse…so we’re living inside trying to fight that discourse, but it’s present in our being [and] in our actions. It’s present in our kids who are—that’s what they’re nervous about” (Interview 1, October 18, 2017).
Patrick believes “good mathematics teacher preparation can happen without the edTPA” (Interview 2, November 1, 2017). He asserts, “I’m not hoping on them [prospective teachers] knowing what thing to put down on a paper for a test” (Interview 2, November 1, 2017). He disagrees with some of edTPA’s language and wants his prospective teachers to think differently. For instance, he states, “If you have an asset-based belief system, then your pre-assessment, using edTPA language, looks for student conceptions, not misconceptions” (Interview 2, November 1, 2017). Thus, he focuses his efforts on equipping prospective teachers with effective mathematics teaching practices, whether he uses the language of the edTPA or not.

Several of the participants find themselves using the discourse of the edTPA to familiarize their prospective teachers with the vocabulary of the assessment. For example, Bianca notes, “I talk about edTPA in everything…. I show the candidates the connection between what they’ve already done and edTPA so they don’t think or feel psychologically that this is a new exercise” (Interview 1, November 1, 2017). Likewise, Heather recognizes that she uses edTPA vernacular—“I have to think about different vocabulary and different ways of talking about things with my students because they have to pass the standardized assessment at the end” (Interview 2, November 6, 2017).

Comparable to the other participants, Anna mentions that she uses the vocabulary of the edTPA during her methods courses “so that when they [prospective teachers] get to edTPA, it’s not something foreign” (Interview 3, January 9, 2018). She also reflects on the various ways edTPA is embedded into her conversation:

I think that it [edTPA] has overall changed how we talk about our instruction to make sure that we’re focused on parts of the lesson plan and then how they transfer to edTPA. If we’re teaching about language demands, we mention that that will be used as part of
edTPA…. I think it has made us more deliberate in using the verbiage of edTPA or making sure that we hit on all the different parts throughout the methods course.

(Interview 1, October 25, 2017)

As communicated in her statement, Anna foresees her role as a teacher educator in assisting prospective teachers to understand and appropriately use the vocabulary of the edTPA. Thus, she interweaves the edTPA in her instruction.

Some participants also find the edTPA as a means to justify why they use specific language and discuss particular concepts in their courses. For instance, Sara states that she continues to teach the concepts she taught before the edTPA, but now she sees herself “using the edTPA verbiage in it” (Interview 1, October 16, 2017). She notes:

One benefit as an educator that I see is you have an outside authority reinforcing some of the things you say in class. I can say that it’s important to teach problem-solving and to use those process standards, but now that there’s an external performance assessment that Georgia depends on, whether or not they get their licenses if they pass, it just gives it a little bit more weight. It’s not just me saying it, but the state of Georgia’s saying it too.

(Interview 2, November 7, 2017)

Thus, edTPA’s recognition as a national assessment is being used by some teacher educators to validate its discourse in mathematics teacher preparation.

I argue that an assessment that infiltrates teacher preparation discourse and provides a rationale for why certain topics appear in teacher preparation must be acknowledged for its power and control over teacher preparation. When teacher educators use the discourse of the edTPA, they focus their attention to a select perspective of what is deemed necessary to ensure teachers are ready for the classroom. I acknowledge that the edTPA is but one of many
perspectives with good intentions to improve teacher education; however, when one perspective
dominates the conversation, I caution that other efforts may be placed on the backburner. Then,
the discourse of teacher education becomes standardized working toward set goals. Teacher
education must consider who speaks on behalf of the profession, what this means for the
profession, and how the profession will be forever impacted by the political agenda.

**Perpetuating Beneficial and Detrimental Teaching Messages**

The edTPA is a complex assessment in that it has many parts and requirements. To ease
the confusion, many participants and their programs break up the assessment into manageable
tasks with explicit instructions as to what must be done to satisfy prompts and rubrics. In making
the assessment comprehensible, some participants say they feel as if they end up creating a
“laundry list” for their prospective teachers to “check the boxes.” Teaching then becomes about
rationalizing one’s actions to items on a list rather than “good” practice, even if they are one and
the same. The list becomes problematic when it prioritizes some concepts and de-emphasizes
others (e.g., equity, mathematics content, technology). Worst yet, when the list is completed and
receives a stamp of approval, one may feel as though the job is done. In this case, prospective
teachers who equate a passing edTPA score with their readiness to teach may be given a false
pretense that they are in fact ready to teach or feel as if reflection is superfluous upon entry into
the profession. In the following sections, I discuss the various ways participants respond to the
edTPA perpetuating beneficial and detrimental teaching messages.

**Strengths (and wished improvements) of edTPA’s focus.** According to the participants,
the edTPA draws attention to several good teaching practices and can be used as a lever to
ensure prospective teachers have access to specific field experience opportunities. However, the
assessment is also believed to overlook some practices that are important in evaluating effective
mathematics teachers (e.g., mathematical content knowledge, technology). The participants share their mixed reviews of edTPA’s focus, including what they believe the edTPA communicates well and the areas for wished improvements.

Some teacher educators describe how the edTPA is used as a lever to have prospective teachers implement tasks that they may not have been able to employ otherwise in their cooperating teachers’ classrooms. According to Sara, sometimes cooperating teachers do not collaborate as much as they should with their prospective teachers. They may not co-plan lessons and assignments because they use what has been given to them or previously created over the years. Given that the prospective teachers must write detailed lesson plans and design assignments specific to their students’ needs, the prospective teachers must collaborate more with their cooperating teachers to create and incorporate new tasks and strategies that closely align with specific goals of the edTPA.

Patrick adds:

We always are encouraging [prospective teachers] to use the lever of I have to be able to do this for the edTPA. I have to be able to put the kids in groups to manage their discussions and give larger problems and have students present and critique their reasoning. We teach them to use that language as a strategy for disrupting the norms.

(Interview 1, October 18, 2017)

Thus, the edTPA is used by some participants as a lever to defend what prospective teachers need to implement during their student teaching field experiences despite what the cooperating teachers do (or do not do) in the classroom.

In addition, several teacher educators discuss what the edTPA does and does not communicate and what this means for the teaching and learning of mathematics. For instance,
Kevin believes “two of the major themes of edTPA are academic language and student-centered instruction” (Interview 1, October 31, 2017). He recognizes that both themes are valued in good teaching practices and agrees with its focus. He asserts:

I think it [edTPA] communicates that all of our learners are individuals, unique individuals, and we need to be in tune with that, be willing to differentiate instruction to meet the needs of the learners, be willing to use assessment data in a reflective manner; not just put a grade in the grade book but in a reflective manner to make ourselves better teachers. I think the notion of reaching all learners and meeting their needs is a big part of the theme. (Interview 1, October 31, 2017)

Furthermore, Kevin says, “It’s not perfect, but I think the overall vision and mission of it are positive” (Interview 1, October 31, 2017). Ultimately, Kevin views the edTPA as a pedagogy assessment. Despite all of his preparation to ensure his prospective teachers are ready for the assessment, he declares, “I want my students to realize that these skills and strategies are important whether or not edTPA exists and even if it completely goes away, I still want them to be able to do all of this” (Interview 2, November 14, 2017). He is at times fearful that this message may be misconstrued with great focus on preparing for the edTPA.

Bianca believes the edTPA communicates the basics of planning, instruction, and assessment well. She believes it makes you a responsive and reflective practitioner and focuses on students being the central focus of the lesson. She also says, “I think it does a really good job of making assessment as a tool and a resource for intentional instruction” (Interview 1, November 1, 2017).

Similarly, Emily sees the edTPA as a resource for her prospective teachers:
I think it helps them consider on a very detail oriented level the different aspects that go into being a good teacher: being student-centered; focusing on individual students and groups of students; how they’re going to plan; how they’re going to assess; [and] how they’re going to do these different aspects of teaching but with the students in mind rather than just the subject area for content. I think it helps them focus in that regard. (Interview 2, November 3, 2017)

Emily also believes edTPA helps her prospective teachers plan for differentiation by recognizing students with “labels”:

They understand maybe when you have labels on kids, how to help an ELL student. They understand maybe things that you could do to address certain learning disabilities. When there’s a label involved, they recognize the need for differentiation. If there’s not a label, then it’s a lot harder to get them to recognize that not all of the students are going to be the same, but they need to have similar opportunities. (Interview 2, November 3, 2017)

Although I am not fond of Emily’s use of “labels” and argue that such a word could do more harm with regards to isolating students, I recognize that she is addressing targeted differentiation, which is important to ensure all students have opportunities to learn.

Likewise, Anna believes edTPA does a wonderful job with preparing prospective teachers to teach with students in mind:

It makes them [prospective teachers] look at the students for their assets, not for their deficits. It focuses on what the students can do, not what they’re missing…. It’s a positive talking piece of looking at data and looking at the students and how can they get them to the standard, which is the goal of teaching. (Interview 1, October 25, 2017)
Although Anna sees edTPA focusing on students’ assets, Patrick interprets the edTPA differently. He sees the edTPA focusing on standards and what students cannot do (yet):

It treats lesson planning like you decide the standard and then you write an objective because they ask you to write an objective, but around here it seems like the standard is all you’re thinking about. Then you pick an activity and decide how you’re going to differentiate. Then you decide how you’re going to provide language support and how you’re going to collect assessment data. That’s not lesson planning to me. That has skipped the core pieces of lesson planning, which is how are you going to manage student-to-student discourse while they’re engaged in these tasks? How are you going to connect different ways students are thinking to one another, and how are you going to summarize in the end. (Interview 1, October 18, 2017)

Thus, Patrick believes the edTPA perpetuates the system of schooling as teaching to standards. He says, “It tells our students that lesson planning is those box things” (Interview 1, October 18, 2017). He also believes that the focus on student misconception assumes a deficit perspective, which is unproductive in teaching mathematics.

Despite the consensus that edTPA focuses on good teaching practices, the participants feel that the assessment lacks focus when it comes to pedagogically addressing mathematics content and technology. For instance, Maria states, “edTPA is not measuring their content pedagogy knowledge” (Interview 1, October 20, 2017). Likewise, Heather remarks:

It lacks a content focus, frankly. Students can teach a lesson in which they do all those things that they’re supposed to do. They show that they have procedural fluency, conceptual understanding, reasoning, and problem-solving. Their math could be completely wrong and nobody’s going to say anything…. I’m pretty sure there is no
checks and balances on whether they’re actually teaching the mathematical idea in an appropriate way for that level of students. (Interview 1, October 23, 2017)

She wishes focus could be placed on building the mathematical concepts in an appropriate manner, but she does not see this emphasized in edTPA’s rubrics. She notes edTPA’s requirement for prospective teachers to interweave conceptual understanding, procedural fluency, and mathematical reasoning and problem-solving in their lessons, but she shares the following concern:

To tell a beginning teacher that you need to demonstrate procedural fluency, conceptual understanding, reasoning, and problem-solving in the same tiny snippet of time, that’s really just setting them up for failure. Sure, could a student demonstrate procedural fluency, conceptual understanding, reasoning, and problem-solving in the same problem? Sure. You can’t demonstrate that the teacher actually was facilitating the development of all of those things in that time. It’s just impossible. (Interview 1, October 23, 2017)

Participants also comment on edTPA’s lack of technology focus. For instance, Maria shares that “edTPA doesn’t care at all about technology. That’s not a component they are interested about, although it’s so important nowadays” (Interview 1, October 20, 2017). This comment is supported by Sara who notes, “For technology, I don’t think there’s real emphasis” (Interview 2, November 7, 2017). Both participants want to make sure their prospective teachers know how to use appropriate technology tools to communicate and represent mathematical concepts in different ways, and they feel as if the edTPA does not convey this same message.

Thus, the teacher educators reveal mixed reviews of edTPA’s focus and what it does and does not communicate about the teaching and learning of mathematics. The edTPA is recognized by most teacher educators as a resource for intentional instruction. Teacher educators share that
the edTPA draws attention to academic language, student-centered instruction, and differentiation, which are described as “good” teaching practices; however, the edTPA is also recognized for not focusing on prospective teachers’ mathematical content knowledge and technology skills. If such concepts are not stressed in the assessment, do they not have merit in what is needed to be effective mathematics teachers? The messages pertaining to what knowledge and skills are necessary of prospective teachers perpetuates what is valued in teaching mathematics.

**An address for equity?** Several teacher educators also express their concerns for the way the edTPA addresses equity. As noted in SCALE’s (2016d) *Understanding Rubric Level Progressions: Secondary Mathematics edTPA*, the edTPA acknowledges the need for prospective teachers to reflect on what their students bring to the classroom (e.g., learning strengths and needs, personal/cultural/community assets, prior academic learning), which is further described by SCALE (n.d.) as edTPA recognizing culturally relevant pedagogical practices. Although edTPA’s rubrics address issues of equity, certain expectations appear in the rubrics of higher scores (i.e., four and five). Prospective teachers know that they can aim for such scores but not need them to pass. Next, I discuss the participants’ comments revealing mixed reviews of edTPA’s address for equity.

When reflecting on equity as it appears in the edTPA, Kevin says, “In print that’s a focus…. I think that’s seen as a theme: equitable teaching; meeting the needs of learners; the importance of differentiation; [and] the importance of the context for learning. I think that is meant to be a goal” (Interview 2, November 14, 2017). Furthermore, he shares:

The edTPA asks the candidate to think about the cultural lives of our students, their interests, their educational experiences in the past, and their language needs…. I think
equity is a thread that runs through it. It may not be stated as precisely as it could be, but I think that is the thread that runs through it…. I’m hoping when they get to edTPA, they will think equity and say, “Oh, I see. If I plan like this and teach like this and assess like this, I will be nurturing equity.” (Interview 1, October 31, 2017)

Kevin believes his prospective teachers do reflect on equity as they complete the edTPA; however, he also expresses concern that the edTPA is not explicit in its address. The same can be said for his address of equity in terms of acknowledging students’ mathematical identities:

I think it probably does in a roundabout way because it has the teacher candidates write about the emotional, social, and cultural needs of their learners as well as talk about prior knowledge and any misconceptions that they discover that the students might have. The lesson plans that they write really need to be student-centered and get the students actively involved, and there’s a notion of nurturing conversation and collaboration, communication among the learners, and all of that helps develop mathematical identity…. I think the notion is embedded in edTPA, whether or not it is specifically stated. (Interview 2, November 14, 2017)

Other participants acknowledge similar responses to Kevin in that equity is considered in terms of addressing students’ needs and backgrounds. For instance, Claire claims:

Some of the rubrics deal specifically with how are you going to address the different learnings of your students? How are you going to address the different backgrounds of your students? The way it seems to me is it’s left somewhat open, in that you can read—that you’re supposed to address the different background needs of your students. You could look at that in terms of culture. You could look at it in terms of language. You can look at it in terms of learning disabilities or learning differences. There’s openness in
those rubrics as to which angle you take to address that. (Interview 2, November 15, 2017)

Here, Claire interprets edTPA’s address for equity as evident but not explicit. Likewise, Sara states:

It’s there, if you look at how they differentiate, like, including differentiation and using cultural assets and things like that; so you can make an argument for that there, but that doesn’t mean students have an awareness of what they’re doing and why they’re doing it. They could just be checking off the box. I would like to know can they talk about what equity in the math classroom means. I would add that in there. (Interview 2, November 7, 2017)

Sara makes a point to have her prospective teachers talk about equity in teaching and learning mathematics even though it may not be at the forefront of edTPA because she says, “It’s important enough that I include it in my class” (Interview 1, October 16, 2017).

Several participants also share their concerns for the edTPA not addressing equity and enabling prospective teachers to pass without attention to equitable teaching. For example, Heather contends, “I don’t think doing edTPA helps our students to think at all about equitable teaching” (Interview 2, November 6, 2017). Similarly, Bianca notes, “You could not be equitable and still get a three on edTPA…. I just feel like just because you passed edTPA doesn’t mean you’re equitable” (Interview 2, November 16, 2017). Likewise, Patrick shares his concern that “the edTPA doesn’t ask any equity, directly equity questions” (Interview 2, November 1, 2017). He also states that “you would not see a AMTE’s standard on understanding the social historical inequities in mathematics education show up on edTPA” (Interview 1, October 18, 2017). Additionally, he admits to using the edTPA to highlight its flaws with his prospective teachers:
The edTPA on its own does not help my students deal with equity, access, and social justice concerns in the classroom. It perpetuates problematic views on students and learning I think that speak to equity issues…. However, the edTPA actually helps me to develop critical future teachers. They understand the edTPA is not telling them anything about being good teachers, and they’re experiencing that at the moment. That allows a huge lever to talk about children and tests and schools. (Interview 1, October 18, 2017)

In summary, most teacher educators express that the edTPA addresses equity but not in an explicit manner. Some participants note that prospective teachers could still pass the edTPA without scoring high on the rubrics that ask prospective teachers to address both students’ prior academic learning and personal/cultural/community assets (i.e., edTPA’s Secondary Mathematics Rubrics 3 and 7). I am not suggesting that edTPA scores be raised; instead, I believe issues addressing equity must be specified in the lower scores and embedded throughout more of the rubrics. I further challenge the edTPA to provide a space to address what equity in the mathematics classroom means and ways prospective teachers use mathematics to address issues pertaining to social injustices.

**Checking boxes and equating passing scores with readiness to teach.** Several participants express their concerns for prospective teachers justifying their actions for the edTPA instead of employing good teaching practices. I argue that the edTPA echoes good teaching practices; however, prospective teachers must also make the same connection. The participants recognize their responsibility in bridging the connection, but they also experience difficulties when the program curricula and the discourse of teacher preparation is infiltrated with the edTPA. Next, I discuss the participants’ comments relaying concerns for prospective teachers “checking boxes” and equating passing scores with readiness to teach.
Patrick thinks the edTPA is “an easy thing to do” because he feels his program has “created a laundry list and checked all the boxes” (Interview 1, October 18, 2017). As a result, his prospective teachers follow suit. However, he detests how he finds himself making note of concepts learned in class and acknowledging them for their connection to the edTPA:

We are consistently connecting certain things back to a section of the edTPA…. We’re getting the students to focus on the edTPA instead of understanding why those things are valuable to do. We’re promoting it by saying, “And don’t forget to make note of this to put it on the edTPA.” That becomes the reason they’re taking note of it. (Interview 1, October 18, 2017)

Patrick sees himself and his prospective teachers associating actions with purposes for the edTPA. He feels tension in doing so because he wants to prepare his prospective teachers; however, he recognizes such actions send the wrong message about why such practices are taught.

Patrick also discusses his concerns for what messages the edTPA scores communicate. He says, “If you a get a 52, what that means to me mostly is that you know how to read instructions and spit back out extremely well” (Interview 2, November 1, 2017). Thus, Patrick believes the scores do not reflect one’s ability to teach, only follow directions. Furthermore, Patrick claims:

It assigns some people who are ready to teach a non-passing score and it assigns people who are not ready to teach a passing score. More insidiously, it teaches these preservice teachers that if you can fill out these forms or answer these questions or get a passing score on the edTPA, you are ready to teach. That little message right there may be the
worst thing that edTPA is doing right now is it’s telling young people who are—they’re novices at this—that you are ready to teach. (Interview 2, November 1, 2017)

Thus, the edTPA “creates this environment where passing the edTPA equates to being a good teacher…. And it also sort of creates this now you’re done stage” (Interview 3, January 9, 2018).

I believe these messages are detrimental to the idea of continuous reflection required by teachers practicing in the field.

Similarly, Anna feels that she ends up teaching her prospective teachers about the edTPA, which takes away from opportunities to discuss other concepts:

We’re trying to teach them about edTPA instead of doing those things like you asked earlier, talking about equity [and] talking about how to reach all their learners. Instead, we’re talking about what the documents are, what they look like, [and] where they’ll find them. There’s a little bit more hand holding and not getting to those deeper levels of questions that I would like to. (Interview 2, November 1, 2017)

She also has concerns that the edTPA only provides a snippet of prospective teachers’ knowledge and skills teaching. If a prospective teacher receives a passing score, that does not mean that reflects his or her progress throughout the program. The opposite is also true:

I had a person last year where I had to put her on an improvement plan. I had to extend her semester, and she passed edTPA with a 40. To me, her edTPA wasn’t a measure of what she could do in the classroom at all. She even said to me, “I can’t believe I passed.” She got a 40. Then a student who failed is probably one of the best student teachers that we’ve had in a while. She had a job before she even graduated, but then she failed edTPA. I don’t think that was a reflection of her as a teacher. (Interview 1, October 25, 2017)
When prospective teachers receive their scores, they may receive mixed messages when it comes to their readiness to teach. Additionally, Anna shares that the prospective teachers who do pass may not reflect on their scores. She asserts, “They will get the score, and they look at that final number. That’s it. In three years now, I have never had a conversation with a student about a question about why they did well on something” (Interview 2, November 1, 2017).

Teacher educators recognize that the high-stakes nature of edTPA forces them to refer to the edTPA, which thereby accentuates to prospective teachers that such discourse and preparation occur for the assessment rather than because they are good teaching practices. Efforts are made by the teacher educators to make the connection that they are one and the same, but the hype of the edTPA can generate a challenge for teacher educators, especially when they feel as if the edTPA is “baked into the class.” When prospective teachers associate their actions with rationale for the edTPA, teaching then equates to proving they can do well on an assessment. Given that the assessment is a measure of one’s readiness to teach (SCALE, 2014a), prospective teachers who receive a passing score may believe they are ready to teach. I argue that this message may in fact be detrimental to beginning teachers who then walk into the classroom with a false pretense that they can teach, especially when they may have experienced difficulties throughout their teacher preparation programs and student teaching field experiences. The opposite is also true. Those who do not pass may have experienced difficult times with the assessment but have “proof” otherwise that they are ready to teach. Teacher education must be careful of what messages the edTPA communicates when it is deemed an accountability tool and used to measure teacher readiness.
**Threatening Academic Freedom**

Several of the participants discuss the edTPA in relation to their academic freedom. Whereas most express that they feel the edTPA does not restrict their freedom per se to incorporate their own ideas in their programs’ curricula, they simultaneously state their concerns for the edTPA threatening the implementation of other activities due to time restrictions. I argue that such concerns equate to threatening academic freedom. Next, I discuss participants’ mixed responses to the edTPA impacting their academic freedom.

Claire sees the edTPA as a valid measure of good teaching that aligns with her teaching philosophy. When planning for her methods courses, she finds herself reflecting on the edTPA and implementing intentional edTPA-related practice. Despite purposeful efforts to accommodate for the edTPA, she believes the edTPA has not impacted her academic freedom as a secondary mathematics teacher educator. At the same time, she shares that she would implement other assignments in her methods courses if she did not have to spend the last third of each course reviewing for the edTPA. When asked what she might do instead, she shares:

One of the things I have yet to do is design a project they [prospective teachers] can work on that’s specifically asking them to attend to something that’s important to them in terms of cultural identity and in terms of social justice. It’s not there in my courses, but it’s one of those things. (Interview 2, November 15, 2017)

In talking about this project further, she shares her concern for how to fit the project in her course that is already packed with edTPA preparatory assignments. She notes that implementing such a project will be challenging for her with respect to planning. She also believes the project may overwhelm her prospective teachers with another assignment.
Similarly, Patrick shares how he used to do an activity at his previous institution in another state where he would pair prospective teachers with a teacher in a local school. Each prospective teacher would write a lesson plan for one another to implement. The writer of the lesson plan would sit and observe the lesson being taught by his or her peer. The prospective teachers would have the opportunity to reflect during the teaching of the lesson. They would imagine being in their peer’s shoes and contemplate what might have been done differently and how to best communicate that in the lesson plan. Patrick shares how he wishes to implement this activity in his current institution but has not found a way to align it with the edTPA. If he implements the assignment as is, he feels that his prospective teachers will look for the connection of the assignment to the edTPA given that they are “focused on filling in the edTPA boxes” (Interview 1, October 18, 2017). Overall, Patrick believes that he must make intentional efforts to implement new and previous activities around the edTPA. He notes: “I don’t think the edTPA is really causing me to lose opportunities to teach something that I would like to. Things just sort of mold around and now edTPA is part of the language” (Interview 1, October 18, 2017). He describes the “molding” as an additional responsibility for a teacher educator in a state with the edTPA.

Kevin does not feel that his modifications to assignments have purposefully made him remove content he felt was important to address in his methods courses. Instead, he states, “It may even make us focus more precisely on some important aspects of teaching than before edTPA existed” (Interview 1, October 31, 2017). However, he notes that he has heard colleagues say that they feel they are limited in time to incorporate other activities and projects that they wish they could do: “Some faculty members say, ‘Oh I would love to be able to do this, but I want to spend time on the edTPA preparation’” (Interview 1, October 31, 2017). In particular,
the faculty members wish to have their graduate-level prospective teachers engage with more educational research. For instance, he shares that “we used to have them do a mini action research project that has since been modified heavily and replaced with some more edTPA focused assignments” (Interview 1, October 31, 2017). Thus, the edTPA has limited some faculty members’ desire to explore other avenues with their prospective teachers.

Whereas the other participants express that the edTPA does not limit their academic freedom despite their concerns, Maria explicitly states otherwise. She shares that the edTPA greatly impacts her academic freedom when preparing her methods courses:

In order to be sure the students are prepared for edTPA, we need to implement different types of assessments in my courses that mirror these tasks from edTPA. I need to be sure my students are receiving certain instruction in critical areas instead of, for example, exploring in this direction or other directions. It limits the faculty’s freedom on choosing their own assessment tools or assignments that represent more of their philosophies of teaching. (Interview 3, January 16, 2018)

As a result, Maria asserts, “I feel like I teach to the test sometimes, instead of actually teaching them [prospective teachers] math or how to teach math” (Interview 1, October 20, 2017). Without the edTPA, she indicates, “I would do more experiments, more research, [and] more content-specific strategies” (Interview 2, November 20, 2017). Thus, Maria feels that the edTPA preparation takes time away from her ability to address other topics in her methods courses.

Although most of the teacher educators acknowledge that the edTPA does not threaten their academic freedom, they do note how they have had to “mold” the edTPA around their methods course assignments. The extra planning that goes into adjusting assignments to simultaneously practice for the edTPA requires them to be strategic with their planning. If the
effort is not taken by the teacher educator to tailor the assignments with edTPA-related practice, it appears as if the assignments are placed on the backburner and not incorporated. I assert that the edTPA threatens academic freedom when teacher educators feel as if they cannot implement these or other assignments due to time constraints and a lack of alignment with the edTPA. The same applies when teacher educators wish to use their own assessment tools but feel as if they must use the rubrics of the edTPA to evaluate their prospective teachers. Teacher education must consider the various ways teacher preparation is influenced by the edTPA as well as what power this assessment has over teacher educators implementing what they believe is best for their prospective teachers.

*Escalating Stress and Anxiety*

The teacher educators also share concerns for the edTPA increasing the stress and anxiety of both teacher educators and prospective teachers. They recognize that Georgia’s adoption of a high-stakes assessment tied to teacher certification will undoubtedly add to the workload and pressure of prospective teachers completing specified requirements to receive their teaching licenses; however, the participants express that they are unaware of the extent to which that pressure will inadvertently affect them. Although not all of the participants feel personally affected by the stress, quite a few discuss their angst. Next, I discuss the various ways the edTPA influences the mental well-being of the participants and their prospective teachers.

Kevin believes the way edTPA is implemented as a high-stakes assessment may be detrimental to prospective teachers. His concern is that “it causes a huge amount of anxiety for our teacher candidates” (Interview 1, October 31, 2017), which triggers him to be anxious:

I feel obligated to make sure that I help prepare my candidates to be successful on it [edTPA], so therefore I have tweaked some of my assignments and my courses. I guess it
also builds some anxiety within me because when my candidates are going through edTPA, during their student teaching experience, I’m not permitted to help them. I’m not permitted to give feedback on their work. That causes anxiety because I want to help, of course. I want my candidates to do as well as they can. I guess it impacts me by building some anxiety and by having the feeling compelled to restructure some of the assignments in my courses. (Interview 1, October 31, 2017)

Thus, Kevin acknowledges that the edTPA causes him anxiety given that he wants to support his prospective teachers for the assessment. However, he must adhere to SCALE’s (2018b) faculty guidelines and policies for edTPA support, which restricts him from providing the feedback he wishes he could give to his prospective teachers. To combat this restriction, he restructures the assignments in his methods courses to offer the guidance he believes his prospective teachers need to prepare for the assessment. Kevin also feels pressure from his provost who talks about the importance of prospective teachers passing the edTPA. Kevin states, “They think about numbers and enrollment and success, of course, but it does put pressure on us to retain students and make sure they do as well as they possibly can with our support” (Interview 1, October 31, 2017).

In a similar manner, Patrick feels nervous because of his prospective teachers’ anxiety and, thus, relates what he is teaching to the edTPA. He says: “It raises the anxiety for our students, and that makes me feel nervous. I want to feel like I’m drawing connections from what we’re learning to edTPA consistently” (Interview 1, October 18, 2017). Patrick is then conflicted because he feels as if he is putting more focus on the edTPA than on other aspects of learning effective mathematics teaching practices.
Claire shares that her program makes intentional efforts to combat prospective teachers’ stress by incorporating edTPA management-type support:

We’ve seen that it can create a stress. I can see if it’s left on its own and not really dealt with directly, it could be such a great source of anxiety. I think what we’re trying to do is not do that [and] bring it into the program and make it just part of their reality so that the anxiety about it over time becomes more managed or at least spread out over time to some extent. (Interview 1, October 30, 2017)

She believes that her program does a good job at supporting the prospective teachers when it comes to reducing stress. The program also does the same for the faculty members; however, she notes that she still feels the stress of making sure her prospective teachers do well, especially with respect to their scores:

You know your numbers need to look basically in line with other people’s numbers.

There’s stress within the numbers…. There is definitely the stress of—“Well, how do we improve what’s not going well? How do we make sure we’re still in the game [and] that our students are doing as well as anybody does?” (Interview 1, October 30, 2017)

Claire attributes edTPA scores as not only reflecting prospective teachers’ success but also the success of her instruction as well as that of the program preparing prospective teachers for the assessment.

Counter to the previous responses, Emily believes the edTPA causes stress for her prospective teachers, but it does not cause her stress:

I don’t know that I personally feel a lot of pressure, and maybe that’s because our program has done a very good job of dispersing that pressure…. When a student doesn’t
do well, it is not coming back to one particular faculty member. We see it as more of a programmatic issue. (Interview 1, October 13, 2017)

Emily does remind me that she resides in the institution’s mathematics department and not in the education department. However, both departments collaborate with one another and identify specific roles to ensure each is assisting one another in preparing the prospective teachers.

On a similar note, Sara and Anna also believe their prospective teachers are stressed from the high-stakes assessment; however, they do not personally experience additional stress. Anna shares that her prospective teachers are not only stressed with completing the assessment, but they are also “fearful of telling a prospective employer if they didn’t pass edTPA” (Interview 1, October 25, 2017). This fear adds to the prospective teachers’ anxieties of whether they will pass edTPA and how their future careers might be impacted if they do not pass the assessment.

In summary, the teacher educators express mixed reactions to the edTPA influencing their mental well-being. Some of the teacher educators share that they feel stressed and anxious because their prospective teachers feel stressed and anxious. They want to fully prepare their prospective teachers for the assessment, which adds stress to their responsibilities as teacher educators. I contend that the stress experienced by the teacher educators is a consequence of the edTPA being a high-stakes assessment. Teacher educators feel as if their prospective teachers’ scores reflect the ways in which they and their teacher preparation programs prepare the candidates. As for the prospective teachers, their described stress and anxiety is understandable, especially with a score as a determining factor in if they receive a teaching license. Teacher education must be mindful of the implications of a high-stakes assessment on all involved. Adequate support needs to be offered to prospective teachers as well as teacher educators so that the mental well-being of all involved is not compromised.
Developing as a Potential Gatekeeper

Several participants express concerns that the edTPA serves as a potential gatekeeper for prospective teachers seeking entry into the teaching profession. They continuously observe prospective teachers struggle to make the financial commitment and navigate the writing demands of the assessment. In the following sections, I discuss participants’ evaluations of edTPA as a “good” measure of one’s readiness to teach. I also address the participants’ concerns that the edTPA could be a potential deterrent to the teaching profession.

edTPA as a good measure of one’s readiness to teach? The edTPA is a performance-based assessment that requires prospective teachers to demonstrate their readiness to teach (SCALE, 2014a). While some participants believe the edTPA is an appropriate tool to measure one’s readiness to teach, other participants perceive the edTPA as just the opposite. Amongst the mixed reviews, participants question if the edTPA is preventing potentially good teachers from entering the profession. They also raise concerns about evaluator scoring, edTPA class selection, and if the edTPA should be a determining factor in prospective teachers receiving certification.

Anna believes the edTPA is not a reflective measure of whether a prospective teacher is ready to handle all of the responsibilities of being a teacher:

I don’t think it [edTPA] measures how they are able to modify instruction on a day-to-day basis. I don’t think it measures how many of our students, or most of our students, have to plan for multiple classes at one time. This is just looking at one class. (Interview 2, November 1, 2017)

She also mentions how prospective teachers can be guilty of strategically selecting and staging their class, which does not accurately reflect their teaching abilities:
They’ve talked about, oh, so-and-so just told me to send the bad kids out of the room while I’m videotaping so they don’t have a problem…. Because edTPA says they only need one student with needs in the class, then they’ll pick a gifted class because a student that’s gifted has needs. So, they’re not necessarily picking an authentic, real world, this is everyday instruction class. They’re picking what’s easiest for them. (Interview 1, October 25, 2017)

Anna is also fearful that some prospective teachers may be at a disadvantage depending on their assigned placement:

We had a student last year that didn’t pass and it was—my gut is that she didn’t pass because she was teaching a remedial course and the students never really got to the level of the standard where they needed to be to meet the standard. (Interview 1, October 25, 2017)

Anna watched this student adapt her edTPA to the needs of the students in her placement but then failed the edTPA most likely due to the situation. Thus, Anna asserts: “It [edTPA] is not a true indicator of their capacity or their entire semester as a student teacher. It’s just one measure of how they do. A measure of what they can put on print” (Interview 3, January 9, 2018).

Patrick, Maria, and Heather also share concerns for the edTPA being a questionable measure of whether or not a prospective teacher is ready to teach. Patrick states: “There are going to be so many very well qualified teachers who would be good teachers but do not pass edTPA. We just lose too many opportunities” (Interview 3, January 9, 2018). He also says how such assessments end up “eliminating anybody who doesn’t fit the mold of what we’re trying to prepare. These tests leave out some wonderful African American students, some wonderful very different thinkers” (Interview 1, October 18, 2017). Maria shares that the edTPA is just one
measure if prospective teachers “have good working skills and can accomplish an assignment” (Interview 3, January 16, 2018), but it does not address one’s mathematics knowledge. Likewise, Heather asserts, “I don’t think who gets a high score is necessarily a good teacher or who gets a lower score is a bad teacher” (Interview 3, February 8, 2018). She, similar to Anna, has also observed prospective teachers strategically selecting their classes for the edTPA. She shares how her prospective teachers “ended up choosing their classes based upon which ones they thought would behave the best for the videotaping” (Interview 1, October 23, 2017).

Kevin believes “all of the components of the edTPA are important in one’s readiness to teach” (Interview 2, November 14, 2017). Thus, he does not disagree with assessing prospective teachers regarding edTPA’s targeted expectations. However, he does raise caution that the edTPA is not flawless: “I don’t think it is a perfect instrument yet. I think there is room for improvement” (Interview 3, January 5, 2018). His main concern is that the edTPA is handled in a way that causes too much anxiety and stress. He sees the edTPA addressing professionalism but says, “It’s not doing so often in a nurturing and friendly climate” (Interview 2, November 14, 2017). Therefore, Kevin believes there may be other ways to develop and assess professionalism that removes the pressure from high-stakes assessments.

Kevin also expresses concern for the evaluators:

We hope, fingers crossed, that they are using their careful training and their professionalism to score them [teacher candidates] appropriately. In that regard, if that’s the way it happens, and I hope it does, our candidates are assessed through a fair system where people have been well trained. But in another sense, those scorers don’t know the candidates, and they don’t know the students within the schools. Even though they read about the school climate, it’s just not the same as being within the school and feeling the
climate. That’s probably a detriment to some degree. If a person in another state far away is assessing our candidate who is doing student teaching in a very inner-city school here, that person might not be able to relate to the climate. That probably has some impact on the scoring that is done, I would think, because even though the scorers are well trained, they are still human beings, and we are all flawed. I wish the scoring could be done by people in Georgia who knew more about the Georgia schools, but I know it’s not just a Georgia exam. (Interview 1, October 31, 2017)

Thus, Kevin acknowledges the advantages and disadvantages of evaluators removed from the setting of the institution. He suggests that the school’s context weighs heavily on how one communicates the setting in edTPA’s Context for Learning. He notes that humans are the scorers, which means “it’s probably impossible to have standardization and reliability across the scorers” (Interview 2, November 14, 2017). Therefore, he contends, “I just wish there was a way that we knew that the scoring would be valid and fair for all” (Interview 2, November 14, 2017).

Although Bianca notes, “I’m okay with it from an instrument standpoint” (Interview 1, November 1, 2017), she believes the profession would have good teachers in the classrooms without the edTPA. She also shares her concerns for the evaluation process:

There’s been times that I’ve seen scores that I don’t agree with. I have to kind of explain to my candidates just the human element of using a rubric in the score, and depending on how expert they [the evaluators] are in the content area, you can get a lot of variation.

(Interview 1, November 1, 2017)

As a reminder, Bianca is trained as an edTPA evaluator, and she notes the human aspect of variation in administering a score.
Similar to Bianca, Claire believes the edTPA is a fair assessment because of the “reasonable” passing scores:

It’s a good roadmap as to what would really make an amazing teacher, if you can get there. For me, a big part of being able to deal with that is the way they’ve set the passing scores. I mean, I am a huge believer in failure and partial success. I think they’ve left that open. I mean, you don’t have to make fives on these rubrics. You don’t even have to pass the majority of them. You can walk away with a lot of twos on a lot of rubrics, as long as you have some threes and maybe a four thrown in. I think they’re looking for evidence that you’re on your way, that you know what it is that would qualify as being a high-level teacher, and that you’re willing to progress in that direction. (Interview 1, October 30, 2017)

She notes that SCALE makes it “clear, maybe overly clear, exactly what they’re expecting in order to have someone pass” (Interview 1, October 30, 2017). Thus, Claire sees the edTPA as an achievable assessment.

In summary, the teacher educators share mixed reviews of edTPA as a good measure of one’s readiness to teach. Some feel as though the edTPA provides insight into prospective teachers’ pedagogy knowledge and skills in a fair manner, while others believe it is just one snapshot of prospective teachers’ abilities. They argue that the edTPA does not accurately reflect prospective teachers’ capabilities throughout their teacher preparation programs’ coursework and field experiences. Additionally, when prospective teachers feel the need to strategically select and stage their classes for the edTPA, such actions are done out of concern that their teaching situations are not “ideal” for edTPA’s evaluation purposes. However, these actions perpetuate the idea that classrooms of students who are well-behaved and have homogenous learning
strengths and needs are the norm. Today’s diverse classrooms need teachers who are equipped to handle complex situations in which they can tend to all students’ needs. Attention must be drawn to what is being measured, who is being measured, and how its implications affect the teaching profession.

**Testing writing competency.** Several participants see the edTPA as a writing competency assessment. Although SCALE (2016b) explicitly stated that “the rubrics do not address the quality of your writing (and you will not be penalized for errors in spelling, grammar, or syntax),” those submitting the assessment are encouraged to “be mindful that your written work reflects your thinking and your professionalism” (p. 5). Some participants are concerned that the writing aspect of the edTPA serves as a potential gatekeeper for prospective secondary mathematics teachers, especially for minorities and those with insufficient writing backgrounds.

For instance, Sara shares that the edTPA can be a challenge for those with disadvantaged writing backgrounds:

If you don’t have a strong background in writing, I can see that the edTPA is a challenge. You might be great at lesson planning, coming up with creative ideas, and engaging students but then having to write out these narratives might be a challenge…. Another concern is if you have a disability or if you have a background where you weren’t taught the writing skills in K–12 settings. Then you are at a disadvantage and it has nothing to do with you as a professional leading a class…. The potential for it to exclude minority teachers if they come from schools where they were underprepared would be my biggest concern. (Interview 3, January 23, 2018)

Similar to Sara, Claire also expresses concern for the writing background of prospective teachers who are particularly interested in mathematics:
We know, in particular, with our math and science majors, they don’t usually come to us with a strong writing background. They’re at a disadvantage right there in trying to get by edTPA…. If you’re trying to work through edTPA and you cannot communicate that in a written format, you may not pass because of that. (Interview 1, October 30, 2017)

Claire’s mention of written communication being tied to scores is reflective of Heather’s response:

edTPA tests if you can write, tell a coherent story using good vocabulary, and write it out as a good argument. Well, let’s think about our secondary mathematics teachers. They’re not trained writers. Now do we include writing in our classes? Absolutely, they complain about it…. As much as they [SCALE] want to say that how it’s written doesn’t matter, that is so not true. It’s written communication. Obviously, if you are not communicating it as well as somebody else, that’s going to affect your score. (Interview 1, October 23, 2017)

Thus, Heather describes edTPA as a writing assessment, which is comparable to Bianca’s comment:

You might have a great teacher with great scores and student achievement in the classroom who may not be as reflective in the written form that edTPA requires. I feel like edTPA’s commentary can be more of a writing competency than a teaching competency. (Interview 3, January 24, 2018)

The teacher educators express their concerns for their prospective teachers having to navigate the writing demands of the edTPA. They mention how those with a weak writing background may be disadvantaged over others who have skills in writing coherent arguments with the vocabulary of the edTPA. In particular, the teacher educators are worried that the
writing emphasis could exclude prospective teachers with learning disabilities, minority backgrounds, and interests in STEM fields in which writing may not be a strength. I am also cautious that those who do not “fit the mold” of good writers may face difficulties in the written portions of the edTPA. I believe that writing and communicating are important aspects of professionalism, but I also believe that there are other factors that are just as, if not more, important in the teaching and learning of mathematics. Mathematics teacher education must consider who benefits from the demands of the edTPA and who may be excluded from the profession.

**edTPA as a deterrent to the teaching profession?** Most of the participants see the edTPA as another hurdle prospective teachers must complete to acquire entry into the teaching profession. Although the participants do not know if interested future teachers change their career trajectories because of the edTPA requirement, the participants can reflect on the prospective teachers who have entered their programs and shared input with respect to the edTPA. Next, I discuss the participants’ responses to the edTPA being a potential deterrent to the teaching profession.

Kevin notes that to his knowledge, no prospective secondary mathematics teachers have backed out of the program because of the edTPA. However, he has known of prospective teachers who have not passed all tasks of the edTPA. As a result, the prospective teachers resubmitted certain tasks. They still graduated from the institution with their degrees, but they were not certified and were issued a temporary, nonrenewable certificate until they passed the edTPA. He is unaware of what has become of those who did not pass the assessment while at his institution. He hopes they eventually pass the edTPA and have the opportunity to pursue their teaching careers in Georgia.
Similar to Kevin’s story, Emily, Sara, and Anna believe that the edTPA has not deterred prospective secondary mathematics teachers from completing their institutions’ teacher preparation programs. However, some participants share other stories. For instance, Claire reveals that she is aware of a couple of prospective teachers who changed their career trajectories when in her program because of the edTPA:

I know of a couple…. When I was working in a seminar class, one of the students in that class spoke of someone from the previous year who decided to go for a different career because they didn’t want to do edTPA. They just walked away from the whole thing because of that. Then there was another student I knew of at the time who didn’t pass by one point, who did not want to retake any part of it or do any part of it again. Walked away from everything completely. (Interview 1, October 30, 2017)

Knowing of at least one prospective teacher who might have felt defeated from a score and left the profession because of the situation does not help teacher recruitment. Kevin also shares this concern. He feels that the added pressure of ever-increasing expectations negatively impacts those wishing to enter the profession, which directly affects the teaching shortage. He wishes that “people could go into teaching and really simply teach the young men and the young women in the classrooms and find joy in the teaching…. But because of all the stress, all the requirements on people, that’s part of the reason why people shy away from it” (Interview 1, October 31, 2017). He suggests that the teaching profession finds a way to “lessen this shortage and encourage more people into the profession” (Interview 1, October 31, 2017).

Additionally, Bianca believes that edTPA’s financial commitment, in addition to other requirements and their expenses, impacts teacher recruitment and retention:
I think we have a recruitment and retention issue…. It’s kind of like we need you but you’re going to have to pay before you come in…. It can feel like hazing a little bit, like another test and another three hundred dollars… It has a negative effect on our shortages especially in the STEM areas. (Interview 2, November 16, 2017)

She believes that there are too many hurdles prospective teachers need to complete before they enter the profession. She foresees the hurdles possibly preventing those interested in teaching because of the financial commitment.

Teacher education must be mindful of the demands placed on prospective teachers. Although high expectations can advance the profession, they can also be a deterrent to those wanting to take part in educating the next generation. Some of the teacher educators view the edTPA as a deterrent for some prospective teachers because it is yet another hurdle and financial expense that must be cleared before prospective teachers can be certified to teach. I agree that teacher education needs to have high expectations for those pursuing a teaching degree. I would want my children to be taught by teachers who meet and exceed the qualifications; however, I also want my children to have teachers and not be thrown into classrooms overflowing with students because of teacher shortages. A healthy balance is needed, and a solution is rather complex. More research from prospective teachers themselves into whether the edTPA is deterring them from the profession could help teacher education explore the ramifications of a high-stakes assessment on prospective teachers pursuing teaching.

**Dehumanizing and Deprofessionalizing Mathematics Education**

The edTPA is thought by some of the participants as a catalyst to dehumanize and deprofessionalize mathematics education. Although the participants acknowledge the edTPA for its good intentions, there is concern by some that the edTPA may actually be doing more harm
than good. In the following sections, I share how the edTPA acts as a “mirror” reflecting the focus of instructors (e.g., teacher educators, prospective teachers) away from who they are instructing (e.g., prospective teachers, students) and back on themselves. Although the mirror can aid with one’s personal reflection on what the edTPA deems “good” teaching, it can also distract from why certain practices are being implemented in the first place (i.e., teaching to the test). Thus, a distorted image results when the focus is on the assessment itself rather than the human, thereby, dehumanizing the practice. Additionally, I discuss how the participants foresee the “TPA” in edTPA as “Threatening Professional Authority” in education.

**Dehumanizing the practice.** According to the participants, the edTPA can be a distraction in rationalizing specified practices in both P–12 and teacher preparation settings. Several teacher educators acknowledge that they intentionally make note of the edTPA, which, in turn, communicates to their prospective teachers that they should implement or reference a particular action for purposes of the edTPA. Although the teacher educators recognize the danger in relating practices to the edTPA, they feel as though they must adequately prepare their prospective teachers for the edTPA, which requires them to make such comments. The teacher educators also observe their prospective teachers doing the same in their student teaching, which perpetuates the idea of teaching to the test rather than teaching the students. As prospective teachers reflect on their student teaching field experiences, they share with their teacher educators that the edTPA helps them see themselves (i.e., mirror) as teachers meeting standardized expectations, but it also limits them from fully focusing on the students, which I contend dehumanizes the practice.
For instance, Patrick believes “edTPA serves as one additional barrier between teacher and child, further dehumanizing our practice” (Interview 1, October 18, 2017). He supports this statement with—

During my classes, I mention, “Use this to put it on your edTPA.” I hate that because what I’m doing is I’m making the purpose of this for your edTPA, not for teaching. Not for teaching well, not for learning how to listen to kids, and not for learning how to have this teacher relationship with another human being. I am turning my students’ focus on the edTPA. (Interview 1, October 18, 2017)

Patrick cringes on the inside when he purposely draws attention to the edTPA. However, he recognizes that he must do so, to a certain extent, to prepare his prospective teachers for the assessment. As a result, he asserts: “It’s causing me to focus less on them [prospective teachers] as humans and more on what they need to put on paper…. It causes me to stop seeing my students as people and more as a widget or a measure” (Interview 2, November 1, 2017).

Similarly, Bianca discusses that standardized performance assessments end up “moving the teacher’s focus from the students and the students’ growth, understanding, and learning” (Interview 1, November 1, 2017). As a result, she says, “We are neglecting the citizens in our classroom” because “the holistic nature of a classroom environment is being chipped away at because of all the pressure” (Interview 1, November 1, 2017). She sees the focus turning to achievement scores in both mathematics teacher preparation and school mathematics. The pressure of achievement on an assessment takes away from the needs of those who are being taught.

Several other participants share their concerns for the edTPA funnelling prospective teachers’ attention to specific tasks and measures rather than seeing teaching for its whole
picture. For instance, Anna declares: “They see it [edTPA] as something to get done. They see it as something that they have to pass, where it doesn’t necessarily connect in their minds to the big picture. They don’t see why they’re doing it” (Interview 1, October 25, 2017). Anna notes that the attention of prospective teachers is drawn to completing criteria for the edTPA rather than engaging in teaching practices that best benefit the students.

Similarly, Heather believes the edTPA impacts prospective teachers’ abilities to reflect on the totality of their student teaching experiences and identify who is the focus of their teaching (i.e., edTPA or the students). She describes how there is so much focus on prospective teachers completing administrative duties (i.e., administering and collecting permission slips), writing lessons, videoing, and self-reflecting in explicit ways for specific days that “it [edTPA] hinders their ability to think of their experience as a whole in student teaching” (Interview 1, October 23, 2017). Her prospective teachers return to her after they submit their edTPA and say, “This is horrible for our students because we are spending so much time, energy, and angst on edTPA that we’re not actually attending to our students’ thinking in the ways that we could or that we want to” (Interview 1, October 23, 2017). Instead, the prospective teachers focus on incorporating tasks with the edTPA in mind. Thus, Heather believes the edTPA distorts prospective teachers’ views of teaching as a humanizing pedagogy.

Several teacher educators describe the edTPA as a distraction when recognizing the purpose of teaching. This statement could be said for both the participants preparing their prospective teachers and the prospective teachers preparing their students. I do not see the distraction as intentional in any aspect by SCALE; instead, I see it as a result of having a high-stakes assessment permeate teacher preparation. However, the profession must make intentional efforts to recognize what messages are sent about why certain teaching actions are taken and for
whom, standardized expectations or students. When the “who” becomes focused on meeting specified needs of an assessment rather than meeting the learning needs of students, the profession needs to consider the influence of edTPA dehumanizing the practice of teaching.

**edTPA as “Threatening Professional Authority” in education.** Several of the participants express concerns for the “TPA” in edTPA “Threatening Professional Authority” in education. Most of the comments are attributed to the assessments being outsourced for evaluation, which thereby degrades the professional judgment of teacher educators. Next, I discuss a few participants’ remarks about the edTPA depprofessionalizing the teaching profession. I also find it important to note that the participants who express the most concern for the edTPA depprofessionalizing teacher education are associated with the large public institutions. They are also the participants who resist the edTPA as much as they can.

Heather is quick to say that “edTPA is not good for our field” (Interview 1, October 23, 2017). She supports this statement with the following:

I think edTPA is very different from, say, the bar exam for law. Primarily because, in a field like law, the bar exam is “Do you have the knowledge it takes to do this?” It does not address whether you can stand up in front of a jury and deliver a closing argument that is effective. We’re trying to say that we can measure, essentially, “Can you stand up in front of a jury and deliver a closing argument that’s effective” and that random people from around the country can better judge that than people who see you teaching day in and day out on a regular basis. I don’t think this serves to professionalize teaching at all. I think it, perhaps, does the opposite. It says, “We need one more way to determine if your students are good enough to be a teacher,” and, if anything, it depprofessionalizes mathematics educators. Yeah, educators. I don’t know how it could professionalize
teaching if it’s deprofessionalizing those who are educating our teachers. (Interview 2, November 6, 2017)

Heather believes the edTPA questions teacher educators’ abilities to assess their prospective teachers and, as a result, “takes away from our professional judgment when it comes to who should be certified to teach” (Interview 3, February 8, 2018).

Additionally, Heather believes the implementation of edTPA in Georgia offends the qualifications of her position:

To a great extent, I do feel that Georgia’s implementation of edTPA, in some sense, deprofessionalized or at least called into question the judgment of mathematics teacher educators here in the state of Georgia. I don’t appreciate that. I feel like I was in school for a long time. I studied teaching. I’m pretty sure I’m qualified to tell you if you’re going to be okay as a teacher. Now, sure, do sometimes personal opinions come in there? Sure. They do. I’m pretty committed to preparing quality teachers…. It’s offensive to have this external assessment placed on us without any sort of consideration of whether it was needed, it was effective, or it was valid. (Interview 2, November 6, 2017)

Heather not only finds her professional judgment threatened but also her power in who decides if her prospective teachers are ready to teach:

One of my biggest oppositions to edTPA is that they’re taking the assessment of our students away from us. Essentially saying that we as faculty in mathematics education cannot reliably say whether somebody should be a teacher or not. Some random retired high school teacher in South Dakota can tell better…. I actually find it insulting…. I have worked with this student for at least one, maybe two, maybe three semesters. I have
watched them teach. I have talked to them about teaching. I think I probably have a better idea of whether they should be a teacher or not. (Interview 1, October 23, 2017)

Patrick is also concerned that “it [edTPA] entirely works against professionalizing the teaching field” (Interview 1, October 18, 2017). He believes edTPA perpetuates the idea that teaching is a measurable action that threatens the human aspect of pedagogy:

If we turn teaching into a bunch of measurable tasks and behaviors, what we’re doing is we’re creating this thing called “teacher” that then could be automated and programmed. Teaching is not reducible to these measurable tasks. Further, by reducing it so that it can become programmed, meaning a computer could do it, is partly, to me, that’s very deprofessionalizing. It’s reducing it to minuscule algorithms that anything could do.

(Interview 2, November 1, 2017)

When attention is drawn away from the human relationships of teaching, Patrick believes what remains is a “teacher” seen as a measurable object, which deprofessionalizes the work of a teacher.

Several teacher educators voice concerns for the “TPA” in edTPA “Threatening Professional Authority” in education. The teacher educators recognize that prior to the edTPA they had the power to determine who was ready to teach. Now, power is placed in an external evaluator’s hands to determine if one has the knowledge and skills to be an effective teacher. However, the external evaluators only receive a packaged portfolio that has been fine-tuned to showcase a snapshot of one’s abilities. Some teacher educators feel as though the edTPA is not a true representation of one’s readiness to teach, which can only be determined by those who work with the prospective teachers throughout their coursework and field experiences. Although I acknowledge the benefit in having an external evaluator who is “unbiased” and removed from
the situation, I stress that the external evaluator is in fact “removed” from the situation and does not know the prospective teacher on a personal level. Thus, a prospective teacher may receive a score that inaccurately reflects his or her performance as observed by those in the prospective teacher’s teacher preparation program, which brings into question whether the professional judgment of teacher educators is valued.

I can easily see why teacher educators feel as through their own training and professional authority is challenged, which discredits teacher educators’ professional opinions. Furthermore, if teaching is associated to “measurable” tasks that can be technologically programmed and replicated, the profession may be deprofessionalizing the very practice it wishes to professionalize. I suggest further research in the validity of the assessment and reflection from the teacher education community to examine the implications of the assessment in professionalizing (and deprofessionalizing) the field.

**Professional Organizations’ Initiatives and the Future of Mathematics Education**

When asked about professional organizations’ initiatives to advance mathematics teaching and learning, most of the participants state they are receptive to the recently proposed recommendations. The participants comment on “standards” and the various ways standards are used as frameworks to align their teacher preparation programs. While most participants indicate that they are knowledgeable about NCTM’s *Curriculum and Evaluation Standards for School Mathematics* (1989), *Principles and Standards for School Mathematics* (2000), and *Principles to Actions: Ensuring Mathematical Success for All* (2014), only a few participants share that they know of AMTE’s (2017) *Standards for Preparing Teachers of Mathematics*. Next, I discuss the various ways participants respond to the professional organizations’ initiatives and embed the works of AMTE and NCTM in their methods courses.
Heather believes professional organizations’ initiatives, in recent years, turned their attention to mathematical modeling, classroom discourse, teaching for social justice, culturally relevant pedagogy, and equity. Although great strides have been made in mathematics education to address these concepts, she sees the need for even more research and push from professional organizations to help teachers implement these concepts on more of a practical level. She believes “having an outside pressure like edTPA could tend to interfere with any reform initiatives because it limits programs’ freedom to do what they think is best for their students, including aligning with professional organizations’ standards” (Interview 2, November 6, 2017). Thus, she warns that the profession must be intentional with what (and who) it aligns with to advance the field.

When asked about NCTM, Heather describes herself as a long-time member who regularly reads their journals (i.e., Mathematics Teaching in the Middle School, Mathematics Teacher, and the Journal for Research and Mathematics Education). She also has her prospective teachers read articles from NCTM’s journals and discuss the current research, which typically focuses on assessment, differentiation, discourse, technology, and equity. In describing how she selects NCTM material for her courses, she states, “We have a focus for our methods classes and then we choose resources from NCTM and other places that support our focus as opposed to using NCTM materials to shape our focus” (Interview 1, October 23, 2017). Thus, Heather’s program strategically uses NCTM material as a resource to enhance the curricula led by her program’s initiatives.

Heather is also involved with AMTE and believes AMTE communicates similar messages to NCTM. She has reviewed AMTE’s (2017) Standards for Preparing Teachers of Mathematics and acknowledges the document for its “pretty high equity threshold” (Interview 2,
November 6, 2017). However, she believes further work is needed to address ways to prepare prospective teachers to be equitable in their teaching.

Patrick acknowledges the great efforts by professional organizations to “put out some policy documents that can nudge the status quo just a little bit” (Interview 2, November 1, 2017). In particular, he comments on AMTE’s (2017) *Standards for Preparing Teachers of Mathematics* and how Standard C. 4. encourages prospective teachers to develop critical perspectives on mathematics education. He feels that AMTE eloquently identifies what is needed for prospective teachers (and teacher preparation programs) to advance equity in the mathematics classroom.

As for his reflection on NCTM, Patrick shares how he initially respected NCTM’s (2000) *Principles and Standards* but became critical of the equity stance given that its focus backtracked from NCTM’s (1989) *Curriculum and Evaluation Standards*. However, he is pleased with NCTM’s (2014) *Principles to Actions*, including the explicit push against tracking and the emphasis on building conceptual understanding before procedural fluency. He also asserts, “There’s nice lip service given to access and equity issues” (Interview 1, October 18, 2017).

Thus, he uses the document in his methods courses and has his prospective teachers review the Mathematics Teaching Practices, which include: (a) establish mathematics goals to focus learning; (b) implement tasks that promote reasoning and problem-solving; (c) use and connect mathematical representations; (d) facilitate meaningful mathematical discourse; (e) pose purposeful questions; (f) build procedural fluency from conceptual understanding; (g) support productive struggle in learning mathematics; and (h) elicit and use evidence of student thinking. He also encourages his prospective teachers to write about the eight teaching practices in their edTPA. He declares: “It’s painful every time I remind them [prospective teachers] to cite this
chart, cite this thing in the book, but that’s sort of the game we’re playing right now. Play the game so they can change it” (Interview 2, November 1, 2017).

When reflecting on edTPA in relation to AMTE and NCTM, Patrick states: “I don’t see contradictions, or if there are contradictions, I don’t see things that are really irreconcilable. However, maybe only 5% of AMTE and NCTM stuff are evident in the edTPA. edTPA is far more generalist-focused” (Interview 1, October 18, 2017). He believes his program prepares prospective secondary mathematics teachers with the recommendations proposed by AMTE and NCTM. He is confident in his belief because most of the faculty members at his institution are active in the organizations and know of their efforts. Thus, he does not have concern that the edTPA will impact the initiatives of professional organizations as long as faculty members in teacher preparation programs remain committed to the agendas of professional organizations.

Kevin believes the professional organizations’ initiatives positively impact the direction of mathematics teacher preparation: “The standards give us wonderful frameworks around which to design our programs, our curricula, our course requirements, our field experiences, and our expectations for our teacher candidates” (Interview 2, November 14, 2017). He is a strong advocate for professional organizations’ efforts to standardize the teaching profession and believes that “standards, when used appropriately by university faculty, impact teacher preparation in positive, strong ways” (Interview 2, November 14, 2017).

Kevin is aware of AMTE’s (2017) Standards for Preparing Teachers of Mathematics; however, he has not taken the time to look the standards up and explore them. He says, “I think going forward, I will make more of an effort to intentionally include them” (Interview 2, November 14, 2017). When it comes to NCTM, Kevin remarks, “I’m a big believer in NCTM
and talk about it a lot” (Interview 1, November 14, 2017). He is aware of NCTM’s (2014) 
*Principles to Actions*, but he does not incorporate the text into his course material.

Kevin believes NCTM communicates that “there are many correct ways to teach, and we should strive for equity, care for our students, and view them as unique individuals. Each student can do mathematics and deserves the strongest mathematics instruction we can provide” (Interview 1, October 31, 2017). With respect to NCTM’s (2000) *Principles and Standards*, he states, “I don’t suppose there is a perfect set of standards, but I believe in the vision” (Interview 1, October 31, 2017). Furthermore, he claims: “Even before those [standards] existed, I believe good teachers, strong teachers always enacted those sorts of practices in the classroom; however, I think now they have a new power because they’re called standards” (Interview 1, October 31, 2017).

Emily describes the recent efforts of AMTE and NCTM as taking on big advocacy roles: “It seems like they’re trying to push good professional standards for different teacher preparation programs [and] being that voice in the community” (Interview 1, October 13, 2017). From her own personal experience, Emily shares how she has benefited from professional organizations’ initiatives to advance professionally:

I have been fairly tightly [*sic*] associated with some of these organizations. They made me think and reflect on my own practice a lot more. I certainly received more resources to make changes in my teaching. I don’t know that I would have had the ability to change as much or improve as much had I not had those organizations making me think about it. (Interview 2, November 3, 2017)

Emily sees NCTM as a resource to support and enhance her class activities and discussions. In particular, she uses NCTM’s (2014) *Principles to Actions* as a textbook and
incorporates various online resources (e.g., Illuminations). For instance, she uses NCTM’s Professional Learning Toolkit online to address concepts in *Principles to Actions* and engage with teaching and learning modules. She says, “We’ll work through a task, talk about the theoretical aspects of whatever the teacher’s actions were, things like that, and then see a video where a teacher is actually doing that in the classroom” (Interview 1, October 13, 2017). She also has her prospective teachers complete an article presentation project where they pick an article from one of NCTM’s journals and present the ideas expressed in the article to the class. As part of the activity they have to tie the reading to an instructional strategy or assessment strategy discussed in class.

Bianca and Maria acknowledge the role of standards in mathematics education and how they influence what is included in their teacher preparation programs. For instance, Bianca asserts: “The standards really kind of dictates what we expose our candidates to. I would say that definitely happens because if it’s there, we discuss it…. So definitely that shapes discussions and activities that we put in our programs” (Interview 2, November 16, 2017). Maria also describes how she refers to standards (e.g., NCTM’s Mathematics Teaching Practices) and incorporates them into her courses so that prospective teachers are made aware of their expectations to address each practice when teaching their students. Neither participants indicate that they are knowledgeable about AMTE or the recent release of AMTE’s (2017) *Standards for Preparing Teachers of Mathematics*.

Similar to Bianca and Maria, Sara and Anna are also not aware of AMTE or AMTE’s (2017) *Standards for Preparing Teachers of Mathematics*. However, both participants reference NCTM material in their coursework. In particular, Sara has her prospective teachers read NCTM’s (2014) *Principles to Actions*. She also has her prospective teachers review NCTM’s
(2000) *Principles and Standards* and discuss the five content standards (i.e., Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability) and the five process standards (i.e., problem-solving, reasoning and proof, communication, connections, and representations). Although Anna also reviews NCTM’s (2000) *Principles and Standards* with her prospective teachers, she does not incorporate NCTM’s (2014) *Principles to Actions* in her methods courses, mainly because she has not reviewed the document herself. However, she does have her prospective teachers review NCTM’s position papers addressing technology and equity. She is fond of the way NCTM “advocates for standards-based quality instruction for all students” and believes “that’s the big picture of what we need to be doing as educators” (Interview 1, October 25, 2017).

Claire sees AMTE as “devoted to equity in mathematics education” (Interview 1, October 30, 2017). Although she has not reviewed AMTE’s (2017) *Standards for Preparing Teachers of Mathematics*, she attended a past annual conference meeting and knows of AMTE’s recent focus in equity. As for her awareness of NCTM, Claire incorporates many readings from NCTM’s journals and publications; however, she has yet to find a way to incorporate NCTM’s (2014) *Principles to Actions* in her methods courses. When she reflects on the initiatives proposed by the various groups, she declares: “I don’t see the discrepancy between edTPA [and] between the things that NCTM is trying to put out there…but I think they’re all moving in the right direction. To me, they look like they’re moving in the same direction” (Interview 1, October 30, 2017).

Overall, the participants see professional organizations advancing the field of mathematics teaching and learning. Although some participants acknowledge professional organizations’ initiatives more than others, the participants make intentional efforts to make themselves as well as their prospective teachers aware of professional organizations’ agendas
and resources. To no surprise, the participants are more knowledgeable about NCTM in comparison to AMTE; however, NCTM entered the field more than 70 years before AMTE. Additionally, AMTE’s (2017) *Standards for Preparing Teachers of Mathematics* had not yet been released a year when I spoke with the participants. While further examination in due time may provide more information, several participants share how their efforts to address the proposed recommendations of AMTE and NCTM are not compromised when simultaneously preparing prospective teachers for the edTPA. To a certain extent, the reform initiatives of AMTE, NCTM, and edTPA appear to complement each other, yet more needs to be done to see how they can work in unison to advance mathematics education.

**Equity in Mathematics Education**

To learn of the various ways the participants develop their prospective secondary mathematics teachers’ understandings of the social contexts of mathematics teaching and learning, I ask for insight into what they do (and do not do) in their methods courses to address issues of equity. The varied responses reaffirm the complexity surrounding this concept. Some participants describe the numerous ways they embed specific activities to ignite equity conversation amongst their prospective teachers, while others share their desires to do more. In the following sections, I use Gutiérrez’s (2007a) equity framework to acknowledge the various dimensions of equity and what participants do to address issues of access, achievement, identity, and power in their methods courses. To guide the analysis, I use Gutiérrez’s dominant and critical axes to place certain efforts. The axes not only serve for organizational purposes but also highlight where efforts are made to advance prospective teachers’ awareness of equity in mathematics teaching.
**Equity’s Dominant Axis**

As the participants discuss equity, concepts of access and achievement are most notably mentioned. Although both concepts fall on Gutiérrez’s (2007a) dominant axis, I am not surprised that these concepts dominated the equity conversation, especially given that equity initially focused on standards, curriculum, instructional practices, and assessment (NCTM, 2000, 2014). However, advocating for access to mathematics also means more attention must be devoted to the human aspect of opportunity, including acknowledgment of students’ mathematical identities and their empowerment to use mathematics (the critical axis). Next, I discuss the participants’ efforts to address access in the mathematics classroom. I also share how the participants associate access with achievement and provide supports (e.g., differentiation) to encourage excellence for each and every student.

In Sara’s methods courses, she talks about equity in terms of both achievement and access. With regards to achievement, she addresses how mathematics can serve as a gatekeeper to career opportunities when students do not “achieve” in mathematics. For instance, she discusses “Algebra One being a gatekeeper to college, and then college math being a gatekeeper to the higher-paying jobs” (Interview 2, November 7, 2017). She also has her prospective teachers complete an equity report that requires them to collect data from the NAEP database and look for discrepancies in achievement. Prospective teachers then analyze the data to see the ways performance, race, and class attribute to the “achievement gap” and how counternarratives can be used to challenge the discourse.

Sara also facilitates discussion regarding access in mathematics classrooms by presenting a situation in which prospective teachers complete computations using a non-Western numeral system. Some prospective teachers have access to supports that help them translate numbers and
complete the arithmetic, while others are not provided additional supports. The prospective
teachers without the supports typically exhibit more discipline problems. At the end of the
discussion, the prospective teachers discuss why that may be and if having access (or not) to the
content in that context contributed to the off-task behavior and the inability to engage with the
mathematics. Thus, the activity addresses access in that teachers must be prepared to breakdown
language barriers so that each and every student can achieve success when learning mathematics.

Similar to Sara, Bianca also addresses concepts of achievement and access with her
prospective teachers. In particular, she facilitates conversations connecting career success with
achievement in school. She talks about career opportunities for those who receive their GED in
comparison to those who attend trade school and a 4-year college. Her prospective teachers
discuss what careers are associated with the degrees and how achievement in mathematics can
serve as a gatekeeper for some in pursuing their careers.

Bianca also has her prospective teachers read articles addressing access in terms of
readily available resources that their students may or may not have in their communities. She
facilitates a class discussion where her prospective teachers review The State of America’s
Children Report, which talks about issues related to homelessness, poverty, hunger, crime, health
concerns, and death. She also has them research the free and reduced-price meals data of the
schools they are placed in for their clinical field experiences. Her rationale behind the activity is
to “get them into the mindset of saying these human beings are coming with more than just
academic knowledge” (Interview 2, November 16, 2017). She also has her prospective teachers
create a resource handbook to aid with locating agencies and services in case their students or
their students’ families need assistance with homelessness. Thus, the prospective teachers are
exposed to civic volunteerism and learning about the communities in which they teach.
Kevin describes access with his prospective teachers as “being able to participate in some form or fashion” (Interview 2, November 14, 2017). He preaches that every student can do mathematics:

It’s not a world where some people can do math and others cannot. It’s not a world where math is only for the academically elite. Everybody can do math and should do math, and teachers should know how to embrace that and plan lessons, tasks, and opportunities that all can do. (Interview 2, November 14, 2017)

To ensure his prospective teachers provide opportunities for all to engage with the mathematics, he shares how to implement self-differentiated tasks, which he describes as follows:

A self-differentiated task is a task that is designed to have a low floor and as high of a ceiling as is necessary so that all students can do it in one form or another…. It differentiates itself. It’s accessible to all. You don’t have to say you all are the slow group, so I want you to do it this way; and you all are the high group, and I want you to do it this way…. If you design a rich task that differentiates itself, it is accessible to all, and those who need to grow can grow. Those who are already performing at a high level can deepen their understanding without even moving on to new topics. (Interview 2, November 14, 2017)

Thus, Kevin believes mathematics teaching should encompass high expectations focused on individualized learning with appropriate support provided to each and every student.

In addition to addressing self-differentiated tasks, Kevin has his prospective teachers watch videos from NCTM’s website and the Teaching Channel. After watching the videos, he asks his teachers the following questions:
What resonated with you about this teacher’s teaching? What did this teacher do, in your opinion, that nurtured equity or showed that he or she embraces equity in the classroom? Did you see anything that you felt was not equitable or where the teacher may not have accentuated the talents of individual students as much as he or she should have?

(Interview 2, November 14, 2017)

The prospective teachers talk about their responses and reflect on their own teaching experiences. As the prospective teachers write their lesson plans, Kevin asks his prospective teachers what they have done to ensure that they implement accessible and equitable teaching practices.

Patrick and Heather both spend time in their methods courses discussing the dangers of tracking and how school systems are structured in ways that are inequitable for some students, especially those who are marginalized. More specifically, Patrick facilitates purposeful discussion in his courses that address issues of why White students are at one end of the hall and Black students are at the other end. Similarly, Heather stresses the importance for mathematical tasks to be open-access and require high cognitive demand. Prospective teachers talk about access in terms of students having the ability to engage in mathematical activity that is appropriate for their strengths and needs. She also shares how AMTE and NCTM encourage “removing barriers and allowing students—no matter what their language at home is or no matter how they’ve done in the past—allowing them to actually engage authentically with mathematics” (Interview 2, November 6, 2017).

Additionally, Claire, Anna, and Emily facilitate discussions with their prospective teachers about access in terms of advancement and how students should be given opportunities to mathematically advance in school. For instance, Claire mentions how she discusses scaffolding
with her prospective teachers and how teachers are responsible for providing high-level thinking opportunities with appropriate differentiation. Likewise, Anna encourages her prospective teachers to break down barriers that may limit students’ opportunities to progress in the mathematics classroom. Similarly, Emily shares with her prospective teachers that “students that have already mastered content should be encouraged to push further even if that means beyond the normal curriculum. Everyone should be challenged to advance” (Interview 2, November 3, 2017). Thus, the participants intentionally include activities and discussions about access and achievement in their methods courses to emphasize the importance of attending to equity.

**Equity’s Critical Axis**

When addressing equity in terms of identity and power, I place the concepts together on what is identified by Gutiérrez (2007a) as the critical axis. This critical axis recognizes opportunities for self-identification in the mathematics curriculum and self-empowerment to use mathematics as an analytical tool to critique the world. To address equitable teaching with respect to identity, the teacher educators comment on specific ways they prepare prospective teachers to identify growth mindsets; address inclusive and culturally responsive mathematics instruction; and recognize students’ mathematical, cultural, and linguistic strengths and resources. They also describe how they work with their teacher preparation programs to place prospective teachers in diverse settings to expose them to students of many backgrounds. Next, I discuss the specific ways the participants broaden prospective teachers’ awareness of equity in terms of identity.

Emily has her prospective teachers complete various assignments that address equity with respect to identity. For instance, she has her prospective teachers read sections from Horn’s (2012) *Strength in Numbers: Collaborative Learning in Secondary Mathematics*. She then uses
the book to facilitate discussions of a growth mindset versus a fixed mindset and how students can receive labels (e.g., dumb, smart) with different expectations that are not equitable. She also has her prospective teachers complete a Beliefs Reflection assignment that requires them to answer questions from an instrument that gives insight into their philosophy of teaching and learning. The instrument and the reflection piece bring awareness to prospective teachers’ various mathematics teaching and learning philosophies.

As for acknowledging cultural awareness, Emily purposefully infuses culture into her mathematics lessons to model strategies for prospective teachers to do the same with their students. For example, she incorporates games from around the world when she reviews probability in her methods courses. She also travels abroad with her prospective teachers, which is encouraged by the teacher preparation program. While abroad, she leads discussions about the similarities and differences between cultures. The discussions open the door to opportunities to talk about equity issues with respect to students’ cultures.

In Claire’s methods courses, she assists her prospective teachers in developing growth mindsets. She also addresses deficit-based thinking and helps her prospective teachers dismantle the labels of students identified as experts and non-experts in mathematics:

They only have experience with their own kind of thinking…. I’ve tried to ask them to step back and understand that not all of your students, who can handle an honors class, intellectually, are going to be just like you were as a student. (Interview 2, November 15, 2017)

To facilitate this conversation, Claire has her prospective teachers complete a clinical interview assignment that requires them to diagnose two students’ knowledge of mathematical concepts. The assignment reveals students’ mathematical strengths and, thereby, communicates to
prospective teachers the need for them to know their students to be able to capitalize on their assets when teaching mathematics. Additionally, she recently began addressing culturally relevant pedagogy and has her prospective teachers read Gutstein and colleagues’ (2005) *Equity in School Mathematics Education: How Can Research Contribute?*

Similar to Emily and Claire, Heather also addresses mindsets and furthers the conversation with readings that discuss mathematical identities. In particular, she has her class read Middleton and Jansen’s (2011) *Motivation Matters and Interests Counts*. From the reading, the class discusses “students’ mathematical identities and the fact that every student is motivated. They might not be motivated to do what you want them to do, but every student is motivated” (Interview 2, November 6, 2017). She strategizes ways for prospective teachers to learn what motivates their students and how such knowledge can be used to generate student interest in learning mathematics.

To address identity in Bianca’s methods courses, she has her prospective teachers reflect on their experiences learning mathematics. She states: “We do things like have them talk about their experience, their favorite math teacher, or the worst situations…. Having them talk about that helps them see how that impacts their instruction, their perceptions, even their enthusiasm about the subject” (Interview 2, November 16, 2017). She also mentions that she addresses culturally responsive mathematics instruction as a theme interwoven into her courses.

Anna incorporates an activity in her methods courses where she has her prospective teachers analyze mathematical textbooks and other various resources. The prospective teachers are asked to look at the texts and critique their content organization and presentation. In reviewing the content, she encourages her prospective teachers to also look at word problems and how they relate (or not) to the students. As the prospective teachers share their critiques, they
strategize ways to ensure texts are inclusive, interesting, and mathematically appropriate for their students.

Kevin believes it is important for his prospective teachers to develop positive mathematical identities themselves so they can then help their students develop positive mathematical identities. He acknowledges that this belief is a theme found throughout his methods coursework, and he addresses this theme by having his prospective teachers focus on what students do know and bring to the classroom. He talks about the curse of knowledge and how having knowledge about mathematical concepts makes it challenging for teachers to reflect on the ways they once learned new content. To combat this challenge, he facilitates discussion about positive mindsets. He believes there is so much negativity in the world toward mathematics and that it has become normalized with people wearing a badge of honor that they do not enjoy mathematics. Thus, he asks for his prospective teachers to challenge the discourse and model positive mathematical identities for their students.

Similarly, Maria also finds it important for prospective teachers to have positive mathematical identities and ensure their students have opportunities to explore their own mathematical identities. She encourages her prospective teachers to be open to different strategies students may share when practicing mathematics. To facilitate this conversation with her prospective teachers, she shares of a time when her son felt dismissed because he approached a mathematical problem using a strategy that did not align with what the teacher had in mind:

It happened to my son. He came home and said, “Mom, the teacher said that’s not correct.” I said, “No, it is correct, but it’s a different method.” You can imagine how frustrated a student may become when he or she has a way to solve the problem but the
teacher is not able to prize and recognize. You can over time lose the student that might do very well. (Interview 2, November 20, 2017)

Thus, she informs her prospective teachers of their responsibilities to help students identify their talents and share their ideas, where they can be inventors rather than discoverers.

Other participants have their prospective teachers complete various activities that provide opportunities for the prospective teachers to self-reflect on their mathematical identities and contemplate who they identify as mathematicians. For instance, prospective teachers in Patrick’s methods courses write their own mathematical autobiography. The assignment provides an opportunity for his prospective teachers to recognize and reflect on their own mathematical identities. In a similar manner, Sara has her prospective teachers complete a “Draw-A-Model-Mathematician” activity. From the activity, Sara’s prospective teachers talk about who they identify as mathematicians and why they draw stereotypical White males and not themselves or their students. She follows up the conversation later in her course with her prospective teachers reading Irving’s (2014) *Waking Up White and Finding Myself in the Story of Race*.

When the focus turns to the participants addressing issues of power, privilege, race and racism, and other systems of oppression in their methods courses, the participants share their difficulties in identifying specific times when they discuss these concepts with their prospective teachers. Of those who shared, most reference haphazard discussions and readings. Nevertheless, most of the participants recognize the importance for prospective teachers to be aware of equity in terms of power, but they feel as if their current efforts are not fully adequate. They believe they sufficiently talk to their prospective teachers about being students’ advocates for equity and social justice in school systems, but they also rely on other courses in their teacher preparation programs to communicate equity in terms of power. Next, I discuss the participants’ actions (or
lack thereof) to discuss issues of power, privilege, race and racism, and other systems of oppression in mathematics education.

Claire admits, “Some of these ideas about equity in math and social justice in math are things that I’m just now learning about more deeply” (Interview 2, November 15, 2017). Although Claire is expanding her own research in social justice issues, Claire recognizes that power structures have limited students in school:

I think for adults to make decisions for children about their futures that limit them, it just seems wrong to me. I think most of those limitations end up, if you look at them very deeply, they end up being about maintaining the power structure. Whether people realize it or not, they’re participating in maintaining a power structure. (Interview 2, November 15, 2017)

When asked if she communicates this idea in her methods courses, she says she provides opportunities for her prospective teachers to share their own school experiences in terms of access and privilege. For instance, Claire shares that one of her prospective teachers said:

In my school, this little group of us were in a little hothouse. We all moved together, and we basically knew each other. We didn’t know everybody else, and we moved from one advanced class to the next; one AP to the next; one honors to the next. That was just the group of us, and we had gone through middle and high school together. (Interview 2, November 15, 2017)

This experience was then compared to another prospective teacher in Claire’s class. Claire recalls the particular prospective teacher sharing how she tried to get in those classes but was told how she “really shouldn’t take that [because] it would be too hard for [her]” (Interview 2, November 15, 2017). From this conversation, the prospective teachers talk about privilege and
realize that they have experienced (or not experienced) being in a privileged group. Although the conversation does make some uncomfortable, Claire is adamant that her prospective teachers understand that in the teaching profession, a teacher is “irresponsible if you’re not willing to deal with it [privilege]. If you’re not willing to examine it from every angle and make an honest attempt to see privilege where it exists” (Interview 2, November 15, 2017). By opening the floor to her prospective teachers to share their stories, she finds ways to discuss power and privilege.

Emily, similar to Claire, also has her prospective teachers share their own experiences with privilege and racial inequities. She notes how it can be difficult to discuss such important topics, but she makes the effort to create a welcoming environment in which her prospective teachers can share:

I have a few Black students who can speak to some of the racial tension that they had felt.
I have some female students who talked about what it’s like being a female in the class.
We try to have a comfortable enough environment to where they can talk about their own personal experiences, which helps them understand each other and then carry that forward into their classes. (Interview 2, November 3, 2017)

She also encourages her prospective teachers to share their experiences while practicing in the field:

One of our students, when they started student teaching, they noticed that they were in a gifted classroom, and every one of the students in there was White. I think he noticed it in particular because he is not White. Because we were having some of these conversations with student teachers on campus, it was something he brought up. Then we talked about what could you do in a teacher position to help that. It was funny because at the same time his teacher was also thinking through these things. He said he went back the next
week and all of a sudden there were students of different colors in the class. He asked the teacher, “Where did all these students come from?” She had just gone down the list and said, “These students have good grades and high enough test scores,” and started calling parents and saying, “Your child should really be in this class.” It was good because we had already talked about some of those things. He was able to go back and have a very meaningful conversation with his cooperating teacher as well about it. (Interview 2, November 3, 2017)

Additionally, Emily facilitates discussion about power in regards to what mathematics is privileged in society and who is recognized for the mathematics. She talks with her prospective teachers about the Leibniz and Newton controversy about who invented calculus. She describes how women and other mathematicians from outside of Europe were also making advances in mathematics; however, these mathematicians were not credited in mathematics history because European mathematics dominated the field. This conversation brings to light mathematics as a political activity.

Similar to Emily, Heather believes mathematics is a political activity and states, “By virtue of attempting to open up mathematics to everyone, you’re engaging in a political activity because you’re challenging the status quo” (Interview 2, November 6, 2017). To help her prospective teachers make note of mathematics as a political activity and address their own deficit-based thinking, she facilitates an activity called Race Cards. The activity consists of cards of different themes (i.e., attributes, grade-levels, mathematics courses, and race and gender). The attributes describe socioeconomic status, mental and physical health, family dynamics, club involvement, behavior, and sexuality. Prospective teachers are divided into groups where each person receives one race and gender card, one grade-level card, one mathematics course card,
and three attribute cards. Everyone simultaneously turns over their race and gender cards and shares their initial reactions. Then the group discusses which “student” might be more privileged within the school based on the characteristic. Then everyone simultaneously turns over the grade-level and mathematics course cards and repeats the discussion. For the last three rounds, all group members simultaneously turn over one attribute card and discuss. Other questions for discussion include: What are your preconceptions of the student? Who has an easier time walking around the school? Who is more likely to be thought of to take honors classes? What are teachers’ expectations of the student? Who has more power of influence over his/her peers? and How would you teach this student? The prospective teachers challenge the stereotypes and discuss equity and access in the mathematics classroom. Following the activity, the prospective teachers discuss ways to be change agents and fight for their students, even if it means challenging the status quo.

Kevin uses a textbook in his methods courses that consists of chapters with a focus on issues of access and inequities in learning mathematics. He has his prospective teachers read about women in mathematics throughout history and how their opportunities have been unfairly stifled. He also talks about the same for minorities and socioeconomically different types of students. He notes: “We talk about myths in mathematics education, like the myth that boys are better at math than girls, children with learning disabilities cannot learn mathematics, and children from lower socioeconomic areas don’t learn mathematics well” (Interview 2, November 14, 2017). Kevin uses such conversations to then address teachers’ responsibilities as advocates for their students. In his methods courses, he says: “We are there for the students. It’s not about you. It’s about the students. You’re there to support them and be their nurturer, be their advocate,
speak on behalf of them, and want things to be better for them” (Interview 2, November 14, 2017).

Kevin also talks about school policies and the fact that not all policies are fair for every student, but he does little to address ways to challenge policies. He mentions how his prospective teachers are typically the ones wanting to discuss policy issues further, but he feels that there is so much else on the agenda. He declares: “I think there will always be difficulties, policies, stresses, controversies. That’s not my greatest area of expertise, though. We acknowledge it. I guess it’s not a major theme in the courses I teach” (Interview 2, November 14, 2017). Thus, Kevin often shies away from the policy conversations because they can become heated and uncomfortable. The same can be said for his conversations regarding issues of race:

I don’t specifically talk about race in my classes, but I do talk about how many people over the years have been neglected or not given the opportunities that they should’ve been given to study and learn mathematics, embrace mathematics. In fact, many people have been discouraged over the years. So, we talk about that in a general sort of way. We don’t get into heated debates or discussions about it. (Interview 2, November 14, 2017)

Prospective teachers in Kevin’s methods courses are also assigned a project where they must select an article from a NCTM journal to read, critique, and present to the class. He shares that his prospective teachers choose topics that address learning mathematics (e.g., gender inequities, stereotypes in mathematics). As his prospective teachers present their findings from the article, conversations of power and privilege often surface. He uses the opportunity to have such discussions, but most of the time discussions surrounding issues of power and privilege are unplanned. He states, “I haven’t deliberately incorporated that, but maybe I should” (Interview 2, November 14, 2017). Thus, Kevin acknowledges the importance of helping his prospective
teachers build awareness of issues addressing power and privilege in mathematics education; however, he recognizes the need for such discussion to be more intentional.

Patrick follows the work of other mathematics education researchers (e.g., Jo Boaler, Rico Gutstein, Rochelle Gutiérrez) and incorporates several of their writings in his methods courses to address issues of power. He has his prospective teachers discuss “What is the mathematics that has been chosen for us to learn?” (Interview 1, October 18, 2017). Similar to Emily, he talks about European mathematics being the mathematics of the dominant society and how this perpetuates opportunity for those in the dominant society. To facilitate this conversation, he has his prospective teachers work on an angle activity. As his prospective teachers complete the activity, he questions why degrees are used as opposed to other possibilities to describe and measure an angle. Thus, his prospective teachers “turn a critical eye into the mathematics that is chosen to be taught” and recognize “an ethnomathematics perspective” (Interview 2, November 1, 2017).

Patrick also talks about the ways “mathematics education functions within a larger spectrum of power dynamics” (Interview 1, October 18, 2017). He wishes for his prospective teachers to “recognize that it’s a perpetuation of White privilege or White supremacy” but he asserts, “I don’t have a nice lesson that’s digging into that well yet” (Interview 2, November 1, 2017). Thus, Patrick is still exploring this space, but he is confident that in time he will find ways to advance these conversations in his methods courses, especially with the assistance of AMTE’s standards.

While Bianca, Anna, and Sara see mathematics as a political activity, they provide vague discussion as to how they prepare their prospective teachers to explore power, privilege, race and racism, and other systems of oppression in their teacher preparation. For instance, Anna
mentions, “I try to give them some time and some focus on looking at what are the political powers, what has happened historically to look at current standards, and why that’s important for them as a teacher” (Interview 2, November 1, 2017). Maria, on the other hand, does not see mathematics as a political activity and does not go into detail about how she addresses equity from this lens.

Insight into the ways the participants develop prospective secondary mathematics teachers’ understandings of the social contexts in mathematics teaching and learning reveals the strengths and areas for improvement in addressing equity in mathematics education. With the aid of current teacher education reform initiatives, the profession continues to advance the conversation of equity; however, teacher educators must be intentional in their efforts to broaden prospective teachers’ awareness of equity in terms of access, achievement, identity, and power. With an understanding that Gutiérrez’s (2007a) dominant and critical axes are needed to critique the status quo, society can begin to rewrite the narratives to include each and every student.
CHAPTER 6
DISCUSSION
Reflecting Back to Move Forward

Teacher education reform is a controversial and highly politicized issue, especially with the advancement of teacher performance assessments used as accountability tools to improve teacher performance (Cochran-Smith et al., 2013). With the release of edTPA as the first nationally available, educator-designed teacher performance assessment to measure prospective teachers’ readiness to teach (SCALE, 2014a), the edTPA fell into the hands of state departments of education and policymakers who adopted the assessment for various purposes (e.g., program approval/accreditation, program completion/graduation, teacher certification). Institutions of higher education, teacher educators, and prospective teachers are forced to respond to the assessment. Coupled with reform recommendations from professional mathematics education organizations (e.g., AMTE, NCTM), mathematics teacher educators are left to tread water and navigate the changing currents of teacher preparation.

In this study, I used a qualitative case study framed within a sociopolitical perspective to critically examine how nine secondary mathematics teacher educators from various institutions (i.e., large public, medium public, small private, and HBCUs) respond to edTPA and professional organizations’ reform initiatives (e.g., AMTE, 2017; NCTM, 2000, 2014) when preparing their prospective secondary mathematics teachers for teacher certification. Additionally, I conversed with the participants to gather an understanding of how they develop their prospective secondary mathematics teachers’ understanding of the social contexts of mathematics teaching and learning as they respond to such reform efforts.
From each participant, I collected data through multiple interviews and artifact elicitation that I synthesized through a sociopolitical lens. More specifically, I used an assemblage of Felton-Koestler’s (2017) What, Who, and How (WWH) framework and Gutiérrez’s (2007a) equity framework to view the social and political dimensions of particular reform efforts in mathematics education. Felton-Koestler’s WWH framework permitted me to explore the participants’ constructed responses to mathematics teaching and learning as a social and political activity. Likewise, Gutiérrez’s equity framework provided a lens to critically explore the social contexts of mathematics teaching and learning by means of mapping equity onto dominant and critical axes.

Data analysis identified eight resonating themes that revealed the edTPA as a catalyst for: (a) motivating program modifications; (b) accommodating edTPA preparatory assignments; (c) altering awareness and discourse in teacher preparation; (d) perpetuating beneficial and detrimental teaching messages; (e) threatening academic freedom; (f) escalating stress and anxiety; (g) developing as a potential gatekeeper; and (h) dehumanizing and deprofessionalizing mathematics education. Additionally, the participants’ efforts to address social contexts with respect to equity revealed strengths and areas for improvement. Next, I reflect back on the findings of the study and conjecture what the results mean for a profession moving forward in an era of reform.

Of the themes identified, the first recognizes the edTPA as a catalyst for motivating teacher preparation program modifications. Although the participants describe the edTPA permeating their programs in various ways, most of the teacher educators indicate that edTPA often takes centerstage as a predominant focus. With edTPA in the spotlight, the teacher educators redesign program curricula to ensure they equip their prospective teachers with the
skills to plan, instruct, and assess as depicted by edTPA’s “proceduralized” process. This response is similarly found in other research that described teacher performance assessments as blueprints for program curricula realignment (e.g., Ledwell & Oyler, 2016; Liu & Milman, 2013; Peck et al., 2010). The teacher educators also share how they use data from the assessment to guide their program curricula changes and inform their instruction, which is evidenced by other researchers (e.g., Darling-Hammond, 2010; Peck & McDonald, 2013). Additionally, the teacher educators reveal their programs’ efforts to add rehearsal edTPA practice (mock-edTPAs) and edTPA-related programmatic support so prospective teachers have opportunities to familiarize themselves with the assessment’s expectations and processes. Such initiatives disclose the various ways teacher preparation programs respond to program curricula changes when modifying for the edTPA (Ledwell & Oyler, 2016) and implement different support structures (Ratner & Kolman, 2016). I caution that varied programmatic support may advantage some prospective teachers with time and resources that may not be accessible to others. Furthermore, when a teacher performance assessment obtains enough power to generate program modifications tailored to its agenda, I argue that teacher education must evaluate the assessment’s influence on a program’s focus. Program modifications derived from a top-down, one-size-fits-all assessment may miscommunicate the “what” and the “who” are of importance in teacher education.

The next theme identified addresses the exorbitant amount of effort taken by some teacher educators to accommodate edTPA preparatory assignments in their methods courses, seminars, and clinical field experiences to prepare their prospective teachers for the assessment. Similar efforts are also reported by other researchers examining the integration of teacher performance assessments in curriculum and instruction (e.g., An, 2016; Barron, 2015). Whereas
recommendations are made by Darling-Hammond and Snyder (2000) to embed assessment-related practice throughout program curricula as not to treat the assessment as program add-ons. I contend that time spent familiarizing prospective teachers with the structure and terminology of the assessment encourages the development and implementation of test-driven curriculum. When instructional time is used to discuss SCALE’s (2016a) edTPA Secondary Mathematics Assessment Handbook and other supplemental materials, valuable time may be taken away from engaging in mathematical and pedagogical learning opportunities (Gurl et al., 2016) and addressing other pertinent content, such as the instructional practices of effective mathematics teachers as proposed by professional organizations (e.g., AMTE, 2017; NCTM, 2000, 2014). Thus, teacher educators’ efforts to accommodate preparatory assignments tailored to the content and expectations of the teacher performance assessments reaffirms that such assessments take priority in mathematics teacher preparation. Therefore, teacher educators are responsible for preparing good teachers for the classroom as well as teachers who are successful on teacher performance assessments.

The edTPA is also described as a catalyst for altering teacher educators’ awareness and discourse in teacher preparation. Several teacher educators share how the edTPA encourages them to refocus their teaching practices to ensure that they model for their prospective teachers the “proceduralized” process of planning, instruction, and assessment; academic language; feedback; and reflection. While I acknowledge that the “refocusing” can aid in improving practice, I caution how an outcome-based assessment may inadvertently encourage teacher educators and prospective teachers to “teach to the test,” which is similarly warned by other researchers (e.g., Gurl et al., 2016; Lit & Lotan, 2013). The teacher educators also comment on the ways the edTPA influences their discourse in teacher preparation. The adoption of test-
specific language not only standardizes what is discussed in teacher preparation but also narrows faculty members’ thinking about instruction (Kornfeld et al., 2007). While other researchers have said that a common language increases accountability and aids with standardizing the measure of prospective teachers’ teaching readiness (Peck et al., 2014; Whittaker & Nelson, 2013), I advise that such language can potentially restrict and depersonalize class conversation that may further develop skills for the classroom. When a high-stakes assessment influences not only the program curricula but also who teaches the curriculum and the classroom discourse, efforts must be made to examine the dominating power of such an assessment tool in higher education.

Additionally, teacher educators describe the edTPA as a catalyst for perpetuating both beneficial and detrimental teaching messages. The teacher educators note that the edTPA draws attention to “good” teaching practices (e.g., academic language, differentiation, student-centered instruction) and raises awareness for prospective teachers to reflect on what their students bring to the classroom (e.g., learning strengths and needs, personal/cultural/community assets, prior academic learning). Similar insight is reported by other researchers (e.g., Chung, 2008; Lin, 2015) who have studied the learning opportunities of teacher performance assessments. While focus on such concepts may be pertinent to good teaching, some teacher educators believe that the edTPA does not place enough focus on other concepts (e.g., equity, mathematical content knowledge, technology skills) that are then questioned for their merit in preparing effective mathematics teachers. Furthermore, the edTPA may miscommunicate to prospective teachers that they rationalize their actions to items on a list (i.e., “check the boxes”) rather than good practice, even if they are one and the same. Thus, teacher education must be mindful of what the edTPA communicates as an accountability tool used to measure teacher readiness and denote specified skills valued in teaching mathematics.
The edTPA is also described as threatening teacher educators’ academic freedom. While some participants explicitly state they do not believe the edTPA restricts their freedom to incorporate their own ideas and activities into their programs, they simultaneously assert that they face difficulty finding time to implement other activities that do not specifically align with edTPA preparation. Thus, teacher educators feel as though they must focus their attention on assignments tailored to edTPA-related practice rather than address other important initiatives (e.g., equity, multicultural education, racism, social justice), as evidenced by other researchers (e.g., An, 2016; Dover & Schultz, 2016; Greenblatt & O’Hara, 2015; Liu & Milman, 2013; Tuck & Gorlewksi, 2016). I argue that the inability to incorporate other assignments that have not been “molded” to the edTPA threatens teacher educators’ academic freedom, which is similarly discussed by An (2016) and Greenblatt (2016). Teacher education must consider what power teacher performance assessments have over teacher educators implementing what they believe is best for their prospective teachers. Additionally, efforts must be made to further explore the impact of teacher performance assessments narrowing pedagogical instruction (Dover & Schultz, 2016; Lachuk & Koellner, 2015; Lit & Lotan, 2013; Madeloni & Gorlewski, 2013) and limiting the criteria for evaluating prospective teachers (Gorlewski & Gorlewski, 2015).

As with any assessment linked to high-stakes ramifications, the edTPA is also described as a contributor for escalating stress and anxiety for both teacher educators and prospective teachers. Although Georgia piloted the edTPA prior to making the assessment consequential for prospective teachers, the teacher educators had to learn of the assessment’s expectations alongside their prospective teachers, some even after the piloting stage. Regardless, several teacher educators express how they are still learning of the assessment and exploring better ways to equip their prospective teachers with the confidence and skills needed to complete the
assessment, which is similarly discussed by Lachuk and Koellner (2015). As teacher educators assume their roles preparing their prospective teachers for their future careers, the teacher educators describe how they experience stress and anxiety with respect to the edTPA. They also share that their prospective teachers feel the same way, as evidenced by other researchers (e.g., Auslander, Smith, & Smith, 2018; Meuwissen et al., 2015; Okhremtchouk et al., 2009). Furthermore, some of the teacher educators see their prospective teachers’ performance as a direct link to their own performance and that of their teacher preparation programs, which contributes to the stress of the teacher educators. Other factors of stress and anxiety are attributed to time constraints, administrative pressure, teaching to the test, and the desire to aid prospective teachers during the assessment. Thus, teacher education must recognize the implications of a high-stakes assessment on both teacher educators and prospective teachers and provide adequate support for the mental well-being of all involved (Greenblatt, 2016).

Another theme identified describes edTPA as a potential gatekeeper. While the edTPA is said to measure one’s readiness to teach and advance professionalism, it also serves as a barrier preventing access to teacher certification (Ratner & Kolman, 2016). Prospective teachers who are denied access because of their scores may not be “ready” for the classroom or may not fit the mold of what is deemed ready by the assessment. The edTPA is described by some teacher educators as more of a “writing competency” than a “teaching competency” assessment. Prospective teachers who may not have the writing skills to reflect in the written form that edTPA requires may be at a disadvantage over others with the skills. Thus, time is spent in teacher preparation programs to learn how to write the “right way” for the assessment (Auslander et al., 2018, p. 132). Although the edTPA acknowledges that “the rubrics do not address the quality of your writing” (SCALE, 2016b, p. 5), prospective teachers who experience difficulties
addressing the specifics of the rubrics (e.g., vocabulary) may struggle with passing the assessment. The assessment then becomes about proving one’s ability to write a defense for their teaching rather than about how one actually teaches in the classroom. Additionally, edTPA as a financial hurdle may be a deterrent to those wanting to teach but who may not have the monetary means to do so.

For the last theme, the edTPA is thought by some of the teacher educators as a catalyst to dehumanize and deprofessionalize mathematics education. To communicate how the edTPA dehumanizes the practice of teaching, I relate the edTPA to that of a “mirror” reflecting the focus of instructors away from those whom they are instructing and back on themselves. Although the mirror aids with prospective teachers’ personal reflections on what the edTPA deems “good” teaching, it also makes it challenging to focus on the students’ needs on the other side of the mirror, thereby depersonalizing the curriculum (Madeloni & Gorlewski, 2013). When attention is drawn to meeting the needs of the assessment rather than the human, the practice becomes dehumanized, which counters professional organizations’ initiatives (e.g., AMTE, 2017; NCTM, 2000, 2014) advancing the instructional practices of effective mathematics teachers.

Additionally, the “TPA” in edTPA can be described as “Threatening Professional Authority” in education. Some of the teacher educators see the edTPA as an outsourced assessment that degrades their professional judgment and discredits their professional opinions in the evaluation of their prospective teachers’ readiness for the classroom. When standardized teacher performance assessments take power away from stakeholders (Greenblatt, 2015), the initiatives employed to professionalize teaching and teacher education harm the progress being made elsewhere in the field to implement new pedagogical instruction that extends beyond set agendas. With raised concerns for teacher performance assessments deprofessionalizing teacher
education (e.g., Cochran-Smith et al., 2013; Jordan & Hawley, 2016; Madeloni & Gorlewski, 2013), teacher education must take a long look in the mirror and then seek what and who lies on the other side.

In addition to navigating the demands of the edTPA, teacher educators must also consider professional organizations’ recommendations for reform (e.g., AMTE, 2017; NCTM, 2000, 2014). While all of the participants indicate that they are familiar with NCTM and use several of its resources to enhance and support their methods courses, only a few of the participants comment on AMTE and AMTE’s (2017) *Standards for Preparing Teachers of Mathematics*. The participants acknowledge that the professional organizations’ standards and recommendations are used as resources and frameworks for many of the participants’ teacher preparation programs. Of the participants aware of AMTE’s agenda, the participants recognize AMTE for its focus on developing mathematics teachers’ critical perspectives and advancing equity in the mathematics classroom. Thus, the teacher educators believe professional organizations are positively influencing the direction of mathematics teacher preparation programs.

In response to AMTE’s (2017) recommendation that beginning mathematics teachers be knowledgeable about the social contexts of mathematics teaching and learning with respect to equity, teacher educators must also examine how they address this initiative in their methods coursework. While many participants share the various ways they address equity in terms of access and achievement, they also disclose how they turn their attention (some more than others) to issues of identity and power. Although teacher educators incorporate activities and discussions pertaining to topics of access, the “achievement gap,” and mathematical identities, they mention issues of power, privilege, race and racism, and other systems of oppression in vague terms, which is similarly reported by other researchers (e.g., Civil, Bartell, Bullock, & Fernandes,
2018). The participants recognize that certain areas of their current efforts are not adequately discussed. With awareness that Gutiérrez’s (2007a) dominant (i.e., access and achievement) and critical (i.e., identity and power) axes are equally important to address equity, mathematics teacher education must look for ways to advance conversations of equity in the teaching and learning of mathematics.

**Limitations**

As I reflect on the limitations of my study, I consider my participants and their varied experiences preparing prospective secondary mathematics teachers. I acknowledge that I purposefully selected participants who taught at various institutions of higher education (i.e., large public, medium public, small private, and HBCUs) in hopes of gathering insight from different contexts in Georgia. I recognize that my embedded, single-case study design only reflects the shared input of nine participants and, therefore, does not necessarily reflect all, or even the majority, of the secondary mathematics teacher educators throughout the state. However, the study’s design is indeed purposeful in that it is not meant to generalize beyond its unique contexts. Thus, I use the descriptive, instrumental case study for purposes of understanding a phenomenon in the real-world context of my participants.

When speaking with my participants, I also recognize that their responses to my inquiry are uniquely shaped by their experiences and the expectations of their teacher preparation programs. Some participants have experience teaching prospective teachers seeking certification in various grade-levels and content disciplines. Although this study focuses on secondary mathematics teacher educators preparing their prospective teachers for the Secondary Mathematics edTPA, I acknowledge that my participants’ responses are largely influenced by these varied experiences, including their review of different edTPA handbooks. I also understand
that institutions place specific demands on teacher educators that influence the way they respond to the edTPA and professional organizations’ reform initiatives. Thus, I provide a description of the participants’ backgrounds as well as information pertaining to their teacher preparation programs in hopes of being transparent with the context of the teacher educators’ responses and communicating potential limitations.

I also note that I solely gathered the perspectives of secondary mathematics teacher educators reflecting on the various ways they navigate reform initiatives while preparing prospective secondary mathematics teachers for certification. Although the perspectives provide me with first-hand insight into how secondary mathematics teacher educators respond, input from others (e.g., administrative deans, department chairs, prospective teachers) engaging with secondary mathematics teacher educators may offer a different perspective. For instance, if I expanded my research participants to include prospective secondary mathematics teachers, I could inquire about what they observe their instructors doing to prepare them for the edTPA. They may also discuss the various ways their instructors use the discourse of the edTPA and vocalize what they have heard their instructors communicate to them about edTPA-related issues (e.g., altered teaching practices, concerns for gatekeeping, increased anxiety, modified coursework). Such insight could assist with expanding and triangulating data, a further research interest of mine.

Additionally, my data collection included multiple interviews with and artifact elicitation from the nine participants. I acknowledge that these methods of inquiry are but only a few that I could have used to collect my data. Although I am confident that my selected methods sufficiently enabled me to examine my inquiry, I recognize that other methods of data collection (e.g., participant observations) could have also been used to aid with my overall understanding of
how secondary mathematics teacher educators respond to reform efforts in mathematics teacher education. For example, the use of participant observations could have assisted with observing classroom discourse and identifying references to edTPA test-specific language as well as noting conversations and activities that address equity.

When formulating my research plan, I contemplated the previously discussed alternative methods and extensions to explore my inquiry. I knew if I broadened my participant pool and accumulated various modes of data, I would have to commit more resources and time to aid with collecting and analyzing my data. I knew that conducting such research would be beyond the feasibility for me to gather in my given timeframe. Thus, I note these observations to acknowledge the limitations of my study and address avenues in which I can further my research.

**Suggestions for Further Research**

Existing research on teaching performance assessments have largely focused on teacher preparation programs, faculty members, and prospective teachers responding to various assessments (e.g., California Teaching Performance Assessment, Fresno Assessment of Student Teachers, Performance Assessment for California Teachers, Teacher Work Sample) that have not traversed national implementation such as that of the edTPA. As recognized by SCALE (2014a), the edTPA is the first nationally available assessment to measure prospective teachers’ readiness to teach. With roughly 775 teacher preparation programs in 40 states and the District of Columbia using the edTPA and/or other similar teacher performance assessments in various ways (AACTE, n.d.-b), research is needed to critically examine how all involved are affected by the policy- mandates surrounding teacher performance assessments.

This study aimed to contribute to the emergent research on edTPA by examining the various ways secondary mathematics teacher educators respond to edTPA while navigating other
reform efforts led by professional organizations in mathematics education (e.g., AMTE, 2017; NCTM, 2000, 2014). While I focused my attention on nine secondary mathematics teacher educators in the state of Georgia, I recognize that this study could be conducted in other states that use the edTPA and/or other teacher performance assessments as program completion and licensure requirements to elicit responses to my inquiry. Furthermore, research revealing secondary mathematics teacher educators’ responses in states with varying high-stakes ramifications (e.g., teacher certification) could provide insight into how an assessment’s power may evoke different responses in different contexts.

I also recognize that this study targeted secondary mathematics teacher educators’ responses, which is but one perspective of many involved in mathematics teacher preparation. Widening the focus to include the perspectives of others involved with preparing prospective secondary mathematics teachers (e.g., administrative deans, cooperating teachers, department chairs) could provide further insight into what is being done in response to reform initiatives. Additionally, prospective teachers can provide a unique perspective of the ways in which reform efforts have influenced their views of mathematics teaching and learning, including the focus and expectations of being ready for the mathematics classroom. Research examining prospective teachers’ insights into reform initiatives and the ways they observe such initiatives influencing their teacher educators and teacher preparation programs can assist with identifying potential solutions that rectify problematic deficiencies and concerns.

As for understanding how secondary mathematics teacher educators develop prospective secondary mathematics teachers’ understandings of the social contexts with respect to equity, continued research could be done to highlight specific initiatives, discussions, and activities that could then be disseminated throughout the mathematics education community. Additionally,
research could be directed at those who contribute to the recommendations of professional organizations in an effort to learn of the intentions behind particular initiatives and problematize what still must be done to advance the field. Thus, this study serves as a stepping stone to critically explore the many reform efforts being made in mathematics teacher education.

**Concluding Remarks**

*Education is political in the best sense of that word.*

—Shirley Hill

As I reflect on my gained insight from this study, I recognize that there are many lessons to be learned about the recent reform efforts in teacher education. Broadly speaking, preparing teachers for future generations is a daunting and complex endeavor. Compiling a list of required knowledge and skills for prospective teachers to execute prior to entering the classroom could extend for miles. Targeting certain items on the list can help the profession identify, in a manageable way, the characteristics of “good” teaching practices (e.g., academic language, differentiation, student-centered instruction). The developers of teacher performance assessments have adopted these “lists” and created measures that could be used to evaluate the practices deemed important for prospective teachers’ readiness to teach. While teacher performance assessments may appear from the outside as if the teaching profession has developed accountability tools with well-defined expectations and clear agendas, thereby professionalizing the field, those on the inside see that there may be pitfalls to such standardized assessments, such as how the assessments evoke test-driven curriculum (Gurl et al., 2016; Lit & Lotan, 2013), stress and anxiety (Auslander et al., 2018; Meuwissen et al., 2015; Okhremtchouk et al., 2009), potential gatekeeping (Ratner & Kolman, 2016), and dehumanized and depersonalized teaching practices (Madeloni & Gorlewski, 2013).
Clearly, the implementation of teacher performance assessments has beneficial and troubling effects on teacher preparation, as evidenced in this study. The assessments’ high-stakes pressure may curtail the depth and breadth of what needs to be addressed in curriculum to best prepare future mathematics teachers for twenty-first century classrooms. As warned by Lit and Lotan (2013), “a narrow and rigid correspondence between the curriculum and the summative examination restricts conceptualizations and understandings of other valid principles of teaching for learning” (p. 66). Thus, narrowed curriculum in teacher education may close windows to diverse perspectives and other important initiatives, such as social justice, multicultural education, equity, and racism (An, 2016; Dover & Schultz, 2016; Greenblatt & O’Hara, 2015; Liu & Milman, 2013; Tuck & Gorlewksi, 2016).

Knowing that teacher performance assessments depict teaching as a standardized practice that succumbs to measurable tasks, many teacher educators feel as though they are responsible for not only preparing good teachers for the classroom but also teachers who are successful on such assessments. To ensure prospective teachers are familiar with assessment expectations linked to their entry into the teaching profession, teacher educators purposefully modify program curricula (An, 2016; Barron, 2015), use test-specific language (Kornfeld et al., 2007), and alter teaching practices to ensure their prospective teachers learn the expectations of the assessments. I recognize that there are observed benefits to teacher performance assessments, such as increasing collaboration among faculty members to refocus program goals (Guaglianone et al., 2009; Peck et al., 2010) and generating learning opportunities for prospective teachers (Chung, 2008; Lin, 2015); however, there are alarming concerns that must also be taken into consideration. Thus, teacher education must problematize these concerns and examine teacher performance assessments from multiple perspectives, including a sociopolitical lens. From this perspective,
teacher education can critically analyze the ways such assessments influence what is defined and
privileged as “good” teaching practices, who is prioritized and measured, and how the agenda of
such assessments revolutionize, for better and for worse, the direction of teacher preparation.

Teacher education must also ensure that specific agendas (i.e., teacher performance
assessments) do not dominate and prevent other important initiatives, such as the proposed
recommendations of professional organizations (e.g., AMTE, NCTM), from derailing new
advancements made in the teaching and learning of mathematics. In recent decades, professional
organizations have turned their attention to mathematics as a social phenomenon, as evidenced in
various reform initiatives (e.g., AMTE, 2017; NCTM, 2000, 2014). A look at mathematics as a
social activity encourages mathematics teachers to incorporate real-world applications and help
students make sense of their personal lives with respect to mathematics (Chronaki, 1999).
Additionally, the social aspect acknowledges mathematics for its authentic contexts rooted in
cultural experiences (Lerman, 1998), which can be incorporated into curriculum to make
mathematical concepts tangible and relatable for each and every student. Mathematics from a
sociopolitical lens can also be used to aid students in recognizing their own social roles as
mathematically literate citizens (Chronaki, 1999). Students can use mathematics as an analytical
tool to challenge the status quo and critique other issues, such as equity, discrimination,
resistance, and oppression (Frankenstein, 1990; Gutstein, 2003, 2006).

For students to engage with mathematics in the described various ways, mathematics
teachers must be equipped with the knowledge and skills to teach mathematics from its social
and political contexts (Gutiérrez, 2013b). Thus, mathematics teacher education must provide
prospective teachers with opportunities to see mathematics as something more than a
“depoliticized body of knowledge” (Felton & Koestler, 2012, p. 25). Prospective teachers need
the space to grapple with the social and political dimensions of mathematics and critique what is mathematics’ purpose, for whom it represents and impacts, and how it relates to other applications. To understand mathematics as more than static facts and procedures, opportunities must be made for prospective teachers to strategize and implement pedagogical instruction that allows students to contextualize mathematical ideas and explore their own mathematical stories as well as others. Prospective teachers must also learn how to design curriculum that enables students to engage with mathematics and recognize its socio-cultural, -historical, and -political implications.

To ensure prospective teachers have opportunities to develop and advance their understandings of the social contexts of mathematics teaching and learning, intentional efforts must be made in mathematics teacher education to assist prospective teachers with exploring the complexities of mathematics, which include examining equity in terms of access, achievement, identity, and power (Gutiérrez, 2007a). I acknowledge that finding the time and resources to plan for such activities and discussions can be challenging, especially when high-stakes teacher performance assessments often take centerstage in methods courses, seminars, and clinical field experiences. Thus, teacher educators must engage in a balancing act, where they find themselves simultaneously providing enough support to help prospective teachers “play the game” while also making sure that too much support does not hinder prospective teachers from exploring other pertinent concepts. With opportunities to critically challenge and further examine the implications of reform initiatives, teacher educators and educational researchers can work to “change the game” and better prepare the next generation of teachers in mathematics education.
REFERENCES


Association of Mathematics Teacher Educators. (n.d.). Brief history of AMTE. Retrieved from https://amte.net/about/history


Civil, M., Bartell, T., Bullock, E., & Fernandes, A. (2018, February). *AMTE Equity Committee exploration: To what extent are AMTE members addressing/meeting indicators toward equity?* Presentation at the 22nd annual meeting of the Association of Mathematics Teacher Educators Conference, Houston, TX.


APPENDICES

Appendix A

Research Recruitment Email

Dear [Insert Name],

I am a doctoral candidate at Georgia State University completing dissertation research (under the direction of Dr. David Stinson) to examine how secondary mathematics teacher educators throughout the state of Georgia respond to the edTPA and professional organizations’ reform initiatives when preparing prospective secondary mathematics teachers for teacher certification. From my research on your institution’s webpage, I believe you may be a perfect candidate.

I am looking to recruit participants who actively prepare prospective secondary mathematics teachers for the Secondary Mathematics edTPA as methods course instructors and/or program coordinators. Participants must also be knowledgeable about the reform efforts of the National Council of Teachers of Mathematics and/or the Association of Mathematics Teacher Educators.

If interested, you will be asked to participate in a total of three interviews, no more than an hour each. You will also be asked to share artifacts (e.g., course syllabi, activities, assessments, projects, dissociated teacher candidates’ work samples). The third (follow-up) interview will discuss the member-checked transcripts and initial analyses.

As a graduate of the University of Georgia (B.S.Ed. Mathematics Education) and Georgia State University (M.Ed. Mathematics Education), researching Georgia’s mathematics teacher preparation with the aid of your help will enable me to explore my research interests as well as gather insight into how I can best guide future mathematics teachers in my upcoming career.

If you are interested in volunteering as a participant for my dissertation research (or know of anyone who might meet the study’s criteria), please respond so I can provide you with further information. Feel free to contact me if you have any questions at 678-779-8230 or amickle1@student.gsu.edu. I appreciate your time and look forward to hearing from you.

Thank you,

Alesia Mickle Moldavan

Georgia State University
College of Education and Human Development
Department of Middle and Secondary Education

Email: amickle1@student.gsu.edu
Phone: 678-779-8230
Appendix B

Recruitment Follow-Up Email

Dear [Insert Name],

I wanted to follow up with you to see if you had a moment to review my dissertation recruitment email and see if you could assist me. If you have any questions or concerns, please feel free to contact me at 678-779-8230 or amickle1@student.gsu.edu. If you wish to meet in-person to further discuss the study, I would be more than happy to visit you at [Insert Institution]. Again, I greatly appreciate your time and look forward to hearing from you.

Thank you,

Alesia Mickle Moldavan

Georgia State University
College of Education and Human Development
Department of Middle and Secondary Education

Email: amickle1@student.gsu.edu
Phone: 678-779-8230
Appendix C

Participant Confirmation Email

Dear [Insert Name],

Thank you for volunteering to participate in my dissertation research to examine how secondary mathematics teacher educators throughout the state of Georgia respond to the edTPA and professional organizations’ reform initiatives when preparing prospective secondary mathematics teachers for teacher certification.

To begin the study, I would like to schedule the first interview, which will last no more than an hour. Please provide me with your preferred date, time, and location (preferably your office) to conduct the first interview.

Following the interview, I also ask that you share some artifacts (e.g., course syllabi, activities, assessments, projects, dissociated teacher candidates’ work samples) that reflect what you use to prepare, instruct, and assess prospective secondary mathematics teachers. The collected artifacts will serve as talking points for the second interview.

Additional information about the research process can be found in the attached Participant Consent Form, which is enclosed for your review. Prior to the start of the first interview, I will provide you with a copy of this form and ask you to sign another copy for my records. If you have any further questions about your participation in this study, please feel free to contact me at 678-779-8230 or amickle1@student.gsu.edu.

Again, I greatly appreciate your time and look forward to hearing from you to schedule the first interview.

Thank you,

Alesia Mickle Moldavan

Georgia State University
College of Education and Human Development
Department of Middle and Secondary Education

Email: amickle1@student.gsu.edu
Phone: 678-779-8230
Appendix D
Georgia State University
College of Education and Human Development
Department of Middle and Secondary Education
Participant Consent Form

Title: Navigating Reform in Mathematics Teacher Education: Teacher Educators’ Responses to edTPA and Professional Organizations’ Initiatives

Principal Investigator: Dr. David W. Stinson
Student Investigator: Ms. Alesia Mickle Moldavan

I. Purpose:
You are invited to participate in a study. The reason for this study is to examine how secondary mathematics teacher educators throughout the state of Georgia respond to the edTPA and professional organizations’ reform initiatives when preparing prospective secondary mathematics teachers for teacher certification. No more than 10 participants will be recruited for this study.

II. Procedures:
If you choose to participate, you will be asked to participate in a total of three interviews facilitated by the researcher, no more than an hour each, over the course of 2 months. The first interview will take place in your office or a public meeting place. The remaining interviews will take place in your office, at a public meeting place, over the phone, and/or through a web-based conference call platform (e.g., Skype). Prior to the second interview, you will share artifacts (e.g., course syllabi, activities, assessments, projects, dissociated teacher candidates’ work samples), which should take no more than 30 minutes to retrieve. A third (follow-up) interview will be conducted for member-checking and validation of claims. Prior to this interview, you will review your interview transcript, which should take no more than 30 minutes to review. Thus, you will commit a total of no more than four hours of your time participating in the research process.

III. Risks:
In this study, you will not have any more risks than you would in a normal day of life.

IV. Benefits:
If you chose to participate, you will not receive any compensation for participating in the research process. The study is not designed to benefit you, but society will benefit from the knowledge gained about secondary mathematics teacher educators’ experiences preparing prospective secondary mathematics teachers for the edTPA, while also navigating professional organizations’ reform initiatives.

V. Voluntary Participation and Withdrawal:
Participation in this study is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may refrain from answering survey and interview questions or stop participating.
VI. Confidentiality:
We will keep your records private to the extent allowed by law. Only Dr. David Stinson and Ms. Alesia Mickle Moldavan will see your information. Your personal name will not be used or shared under any circumstance. Instead, we will use an identification number and corresponding pseudonym on all study records, forms, and published material. All interviews will be audio-recorded. All audio files and electronic information will be stored on Ms. Alesia Mickle Moldavan’s secure, password-protected computer. Obtained hard copy material will be stored in a locked drawer in Ms. Alesia Mickle Moldavan’s office. To protect privacy, the consent form information as well as the identification key associating the research participant’s identification number and corresponding pseudonym will be stored separately from the obtained hard copy material in a different locked drawer. Audio-recordings will be destroyed after they are transcribed, and the typed transcript will be destroyed 10 years from the date of each interview.

VII. Contact Persons:
If you have any questions during the study, you may contact Ms. Alesia Mickle Moldavan at 678-779-8230 or amickle1@student.gsu.edu and Dr. David Stinson at 404-413-8409 or dstinson@gsu.edu. You can also call if you think you have been harmed by the study, Call Ms. Susan Vogtner in the Georgia State University Office of Research Integrity at 404-413-3513 or svogtner1@gsu.edu if you want to talk to someone who is not part of the study team. You can talk about questions, concerns, offer input, obtain information, or suggestions about the study. You can also call Ms. Susan Vogtner if you have questions or concerns about your rights in this study.

VIII. Copy of Consent Form to Participant:
We will give you a copy of this consent form to keep. If you are willing to volunteer for this study and be audio-recorded, please sign below. Thank you.

___________________________________________
Printed Name of Participant

____________________________________________
Signature of Participant                        Date

____________________________________________
Principal Investigator or Researcher Obtaining Consent                        Date
Appendix E

Initial Interview Protocol

Date: Interviewee:
Time: Place:

Overview:

Thank you for volunteering to participate in an interview to examine how secondary mathematics teacher educators throughout the state of Georgia respond to the edTPA and professional organizations’ reform initiatives when preparing prospective secondary mathematics teachers for teacher certification. Information discussed in this interview will remain confidential. The interview will take approximately one hour and will be audio-recorded. After the recording has been transcribed, the recording will be destroyed. If at any point during the interview you feel uncomfortable, you may refrain from answering a question or participating in the rest of the interview. May I continue with this audio-recorded interview?

Questions and Probes:

1. Tell me more about your position at your institution.
   a. How long have you had your position at your institution?
   b. What are some of the responsibilities of your position?
   c. How do you engage with prospective secondary mathematics teachers?

2. Describe your secondary mathematics teacher preparation program at your institution.
   a. Describe the overall vision or mission of your program.
   b. How has this vision or mission evolved while you have been in the program?
   c. Describe the program requirements, including methods courses, clinical field experiences, and exit portfolios.
   d. When is the edTPA completed in your program?
   e. Roughly how many prospective secondary mathematics teachers graduate each year?

3. Tell me about how you prepare prospective secondary mathematics teachers.
   a. How has your role of preparing prospective secondary mathematics teachers changed at your institution?
   b. What, if anything, has influenced your preparation of prospective secondary mathematics teachers?

4. At your institution, describe the methods courses used to prepare prospective secondary mathematics teachers?
   a. Are the methods courses specific to secondary mathematics education?
   b. Describe how you address the link of mathematics content to applications and real-world problem-solving in your methods courses? How is this idea communicated in the teaching and learning of mathematics?
   c. How many prospective secondary mathematics teachers are typically enrolled in these courses?
5. When planning methods course curriculum, what resources do you incorporate?
   a. Can you elaborate on why you use the described resources?
   b. What do the resources communicate about the teaching and learning of secondary mathematics?

6. Given that the state of Georgia requires prospective teachers to complete the edTPA for teacher certification, I have a few questions addressing the edTPA at your institution.
   a. How has the edTPA impacted your program’s focus on preparing prospective secondary mathematics teachers?
   b. Describe when the edTPA is introduced to your prospective secondary mathematics teachers in your program.
   c. Describe how your prospective secondary mathematics teachers work with the edTPA throughout their program.
   d. How does the edTPA impact prospective secondary mathematics teachers’ clinical field experiences?
   e. Describe how the high-stakes nature of the edTPA impacts your prospective secondary mathematics teachers in your program.

7. Describe your role preparing prospective secondary mathematics teachers for the edTPA.
   a. How has the edTPA impacted you as a teacher educator when planning methods course curriculum? Has the edTPA impacted your academic freedom in any way?
   b. What has the edTPA brought awareness to in preparing for your methods courses?
   c. Does the edTPA facilitate or hinder what you are communicating in your methods courses?
   d. How do you make the edTPA manageable for your prospective teachers?

8. Describe how you incorporate the edTPA in your methods courses.
   a. How do you and your prospective teachers refer to the edTPA Secondary Mathematics Assessment Handbook?
   b. Are there other edTPA related resources that you or your prospective teachers reference?
   c. Describe specific activities in your methods courses where you address the edTPA.
   d. Do you incorporate edTPA’s prompts into activities? Which prompts do you address?
   e. Do you reference edTPA’s rubrics when assessing activities? Which rubrics do you address?

9. What do you believe are the main focal points of the edTPA Secondary Mathematics Assessment Handbook?
   a. How does the handbook present the teaching and learning of secondary mathematics?
   b. What messages are sent about mathematics content throughout the edTPA Secondary Mathematics Assessment Handbook?
   c. What messages are sent about access and equity in the edTPA Secondary Mathematics Assessment Handbook?
10. Do you think the edTPA is a good measure to evaluate one’s readiness to teach?
   a. What do you feel the edTPA communicates well in preparing high-quality teachers? What do you feel the edTPA lacks as an assessment?
   b. When your prospective teachers receive their edTPA scores, does your institution or you as an individual do anything to help them reflect on their strengths and areas for growth?

11. Describe your familiarity with the National Council of Teachers of Mathematics.
   a. Tell me more about what you believe is of importance to NCTM when communicating effective ways to prepare students for school mathematics?
   b. Tell me about times when you reference NCTM material in your methods courses.
   c. Specifically, what NCTM material do you review?
   d. How does NCTM’s material influence your course curriculum and instructional focus?

12. In 2014, NCTM released Principles to Actions, which discussed how NCTM’s Principles can be put into action to ensure mathematical success for all.
   a. Tell me what you know about NCTM’s Principles to Actions.
   b. One of NCTM’s six guiding principles addresses issues of access and equity. Describe how you address such issues in your course curriculum.
   c. Discuss how the edTPA influences or hinders NCTM’s efforts to discuss access and equity.

13. I am also interested in your familiarity with the Association of Mathematics Teacher Educators (AMTE). Describe your experience with AMTE.
   b. How does AMTE’s standards influence your course curriculum and instructional focus?
   c. Discuss how the edTPA influences or hinders AMTE’s reform initiatives.

14. I have enjoyed discussing the reform initiatives of edTPA, NCTM, and AMTE. Before we close, is there anything you wish to add to this interview?
   a. Are there any other questions you think I should ask of others in future interviews pertaining to this discussion?
Appendix F

Second Interview Protocol

Date: 
Time: 
Interviewee: 
Place: 

Overview:

Thank you for continuing to participate in a follow-up interview to examine how secondary mathematics teacher educators throughout the state of Georgia respond to the edTPA and professional organizations’ reform initiatives when preparing prospective secondary mathematics teachers for teacher certification. Similar to the first interview, information discussed in this interview will remain confidential. The interview will take approximately one hour and will be audio-recorded. If at any point during the interview you feel uncomfortable, you may refrain from answering a question or participating in the rest of the interview. May I continue with this audio-recorded interview?

Questions and Probes:
The purpose of this second interview is to continue the initial interview’s conversation and reflect on the artifacts you provided me with prior to today’s interview.

1. Part of AMTE’s standards focuses on preparing mathematics teachers for the social contexts of mathematics teaching and learning. I have a few questions pertaining to your preparation of prospective secondary mathematics teachers with this in mind.
   a. How do you assist prospective secondary mathematics teachers in realizing the social, historical, and institutional contexts of mathematics teaching and learning?
   b. How do you prepare your prospective teachers to be advocates for students?
   c. What is meant by access to mathematics? What about the advancement of mathematics learning?
   d. How do you prepare prospective secondary mathematics teachers to understand access and advancement to mathematics learning? Are there specific activities, readings, or reflections you incorporate into your methods courses?
   e. How do you address inequities in mathematics education?
   f. In your methods courses, how do you draw attention to equitable teaching practices? Are there any specific materials you reference?
   g. How do you prepare prospective secondary mathematics teachers to be advocates for equitable mathematics teaching and learning?
   h. Do you foresee the edTPA guiding prospective secondary mathematics teachers to be advocates for equitable mathematics teaching and learning? Are there specific edTPA prompts or rubrics that emphasize this?
   i. How do you help prospective secondary mathematics teachers recognize their role in cultivating positive mathematical identities with their students?
j. Do you foresee the edTPA guiding prospective mathematics teachers to address issues of cultivating positive mathematical identities? Are there specific prompts and rubrics that emphasize this?

2. One of AMTE’s standards suggests that mathematics teachers should be able to identify and implement practices that draw on students’ mathematical, cultural, and linguistic resources/strengths. How do you prepare your prospective mathematics teachers to do so?
   a. How do you assist prospective secondary mathematics teachers in challenging policies and practices grounded in deficit-based thinking in schools?
   b. Do you foresee the edTPA guiding prospective secondary mathematics teachers to draw on students’ mathematical, cultural, and linguistic resources/strengths? Are there specific prompts or rubrics that emphasize this?

3. AMTE’s standards also suggest that mathematics teachers be knowledgeable about the roles of power, privilege, and oppression in the history of mathematics education. How do you help prospective secondary mathematics teachers to understand these roles?
   a. Is there specific literature and research you reference in your methods courses?
   b. Do you foresee mathematics teaching as a political activity?

4. In your opinion, how have professional organizations’ (i.e., AMTE, NCTM) reform initiatives impacted the direction of mathematics teacher preparation?
   a. How have you been personally affected by reform initiatives as a mathematics teacher educator?
   b. How do you feel our future mathematics teachers are affected?

5. How would you describe the impact of standardized assessments in professionalizing the teaching profession?
   a. How have standardized assessments impacted you as a mathematics teacher educator?
   b. How do you feel our future mathematics teachers are affected?

6. I have reviewed your provided artifacts and want to follow up on a few questions.

7. Again, thank you for taking the time to participate in the second round of interviews. Is there anything else you wish to add to the interview before we close?
Appendix G
Third Interview Protocol

Date: ____________________   Interviewee: ____________________
Time: ____________________   Place: ____________________

Overview:

Thank you for your continued participation in the study to examine how secondary mathematics teacher educators throughout the state of Georgia respond to the edTPA and professional organizations’ reform initiatives when preparing prospective secondary mathematics teachers for teacher certification. I will now conduct a third (follow-up) interview. Similar to the previous interviews, information discussed in this interview will remain confidential. The interview will take no more than one hour and will be audio-recorded. After the recording has been transcribed, the recording will be destroyed. If at any point during the interview you feel uncomfortable, you may refrain from answering a question or participating in the rest of the interview. May I continue with this audio-recorded interview?

Questions and Probes:
The purpose of this third (follow-up) interview is to member-check and validate my initial analyses.

1. Prior to the start of this interview, you received and reviewed the transcripts of the two previous interviews. As you read through each transcript, I asked you to highlight anything that you considered to be most reflective of your response and experience navigating the edTPA and other reform initiatives in the preparation of prospective secondary mathematics teachers. You highlighted the following statement(s).
   a. Tell me what made you highlight the statement(s).

2. I noticed you elaborated and/or clarified the following statement(s).
   a. Tell me more about the modification(s).

3. I noticed you deleted the following statement(s).
   a. Tell me more about why you wished to remove the statement(s).
   b. How could a slight modification be made to keep the statement(s) included in the transcript(s)?

4. From my initial review of your shared materials and member-checked transcripts, I made the following initial analyses.
   a. Is there anything you would remove or include to expand on these initial analyses?
   b. Do you confirm these analyses?
5. I wish to ask a few demographic and experience questions that would assist me with contextualizing the spectrum of my research participants. Again, information gathered will remain anonymous and separate from the general description of the institution.

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<th>Demographics and Experiences</th>
<th>Response Options</th>
<th>Your Response</th>
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<tbody>
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<td>Female</td>
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<td>What is your race?</td>
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<td>65+</td>
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<td>Other Education</td>
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<td>Other (Non-Education)</td>
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<td>How many years were you a classroom teacher (K–12)?</td>
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<td>21+</td>
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<tr>
<td>How many years were you a teacher educator (professor)?</td>
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<td>21+</td>
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6. Thank you again for your time and support throughout this research process. If you have any remaining questions for me about the research, please feel free to let me know now or contact me via email or phone.
Appendix H

Member-Checked Transcript Email

Dear [Insert Name],

Thank you for your continued participation in the study. I have transcribed both interviews and would appreciate your review of each transcript in preparation for my initial analysis. Each interview transcript is labeled and attached.

As you read through each transcript, highlight anything that you consider to be most reflective of your response navigating the edTPA and professional organizations’ reform initiatives in the preparation of prospective secondary mathematics teachers. You may do this using the highlighter feature in Word. Additionally, you may edit, delete, elaborate, and/or clarify anything you communicated in the transcript using the comment and tracked changes features found under "review" in Word. If preferred, you may also make a note of the line number(s) and provide a comment in a separate document.

If you are satisfied with the transcript, do not feel that you have to make any edits. There is no need to “correct” filler words or grammatical issues given that the context is of my major concern and conversational language is quite different from text. Additionally, know that while reviewing your comments, you might express feelings of self-consciousness and uncertainty. I assure you that I value and respect your perspective for its contribution to the broader understanding.

Please let me know if you have any questions or concerns at 678-779-8230 or amickle1@student.gsu.edu. I appreciate your time and look forward to hearing from you.

Thank you,

Alesia Mickle Moldavan

Georgia State University
College of Education and Human Development
Department of Middle and Secondary Education

Email: amickle1@student.gsu.edu
Phone: 678-779-8230
## Appendix I

### Coding Chart

<table>
<thead>
<tr>
<th>Categories</th>
<th>Codes</th>
</tr>
</thead>
</table>
| Participant demographics    | Job responsibilities  
|                             | Personal schooling  
|                             | Professional experiences |
| Institution description     | Institution classification  
|                             | Program information  
|                             | Program mission |
| Teaching methods            | Curriculum resources  
|                             | Instructional pedagogy  
|                             | Connecting mathematics with applications  
|                             | Messages of mathematics teaching and learning |
| edTPA                       | Program modifications and support  
|                             | Reviewing edTPA resources  
|                             | Implementing edTPA-related practice  
|                             | Modifications to course syllabi and assignments  
|                             | Influencing teaching practices and discourse  
|                             | edTPA’s teaching messages  
|                             | edTPA’s equity focus  
|                             | Academic freedom  
|                             | Stress and anxiety  
|                             | Assessment scoring and gatekeeping  
|                             | Impact to teaching profession |
| Equity                      | Discussing social, historical, and institutional contexts  
|                             | Equitable teaching practices  
|                             | Challenging inequities |
| Access                      | Defining access  
|                             | Modeling differentiated support |
| Achievement                 | Defining achievement  
|                             | Challenging achievement gap |
| Identity                    | Cultivating positive mathematical identities  
|                             | Identifying deficit-based thinking  
|                             | Recognizing cultural, linguistic, and mathematical resources |
| Power                       | Recognizing power, privilege, race, and oppression  
|                             | Mathematics as a political activity  
|                             | Preparing advocates |
| AMTE                        | AMTE experiences  
|                             | AMTE messages  
|                             | Standards for Preparing Teachers of Mathematics |
| NCTM                        | NCTM experiences  
|                             | NCTM messages  
|                             | Principles to Actions |