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Teacher Beliefs about Providing Instruction for Gifted Students in Inclusive Mathematics Classrooms

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This is to certify that the doctoral dissertation by

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Abstract

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MEd, National University, 2001

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Kindergarten – Grade 12 (K–12) students identified as gifted in mathematics in the United States are not being appropriately challenged. Teachers are the most important school-related factor that contributes to student success; however, researchers have not explored the experiences of teachers who work with gifted students in inclusive mathematics classrooms. The purpose of this qualitative, transcendental phenomenological study was to explore the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms. Bandura's social cognitive theory framed the study. Interview data were collected from 12 teachers who provide mathematics instruction for gifted students in inclusive classrooms and analyzed using a modification of the Van Kaam method of analysis for phenomenological data. Several themes emerged from the interview data that may positively or negatively impact teacher self-efficacy. Based on those themes, recommendations were made that include utilizing a common gifted identification process, providing gifted-specific training opportunities for educators, promoting collaboration among educators of gifted students, providing opportunities for teachers to reflect on the impact of their instructional practices on gifted students, and creating libraries of math-specific gifted resources at each school site. This study has the potential to contribute to positive social change by advancing knowledge in the field of gifted instruction, improving teacher preparation programs, improving teacher job satisfaction, and improving the mathematics learning of gifted students in inclusive mathematics classrooms.

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Dedication

This dissertation is dedicated to my family who encouraged me to pursue my dreams and helped me persevere throughout the completion of my doctoral degree. We did it, together. Piti, piti zwazo fè nich li.

Acknowledgments

I received a great deal of support and assistance throughout the writing of this dissertation and the completion of my doctoral degree. I would first like to thank my committee members, Dr. Wade Smith, Dr. Michael Marrapodi, and Dr. Danielle Hedegard, whose expertise and guidance were invaluable throughout this process. I would also like to thank my editor, Keresa Britton, for providing indispensable feedback on my writing. Each of them contributed to my growth as both a researcher and as a writer.

Next, I would like to acknowledge my husband, my daughters, and my mother for their relentless support, patience, comic relief, and sacrifices throughout this long and painstaking process. I hope that throughout this journey I have made them half as proud as they have made me. In addition, I would like to thank the countless other family members and friends who stood by me and offered support, encouragement, and caffeine when I needed it the most. Without all of them by my side, I likely would not have been able to persevere. This degree is a culmination of all of our hard work, dedication, and positive thinking. This journey has taught me the true meaning of grit.

Lastly, I would like to thank the educators who agreed to participate in my study. I could not have completed my dissertation without them. I am eternally grateful for their generous gifts of time, honesty, and trust. Their passion for teaching and their dedication to their students inspired me. Their students are incredibly fortunate to have them as teachers, mentors, and role models.

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Chapter 1: Introduction to the Study

In the United States, K–12 students identified as gifted in mathematics are not appropriately challenged (Morris, 2013). A contributing factor for this issue is that teachers are not adequately prepared to instruct gifted students in their mathematics classes (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen, Eskelson, & Allsopp, 2016). This is especially evident in inclusive classrooms, where teachers are expected to meet the needs of students who possess a wide range of ability levels (Alderton & Gifford, 2018; Everett, 2017; Faragher, Stratford, & Clarke, 2017; Kurth & Forber-Pratt, 2017; Rubenstein, Gilson, Bruce-Davis, & Gubbins, 2015; Sheehey, Wells, & Rowe, 2017; Van Ingen et al., 2016).

Bandura (1997) found that a person's perception about a situation can be a leading factor in determining how that person will respond to that situation. As a result, teachers' thoughts about their ability to meet the needs of gifted students in their classes may be a powerful predictor of student success.

The literature related to educating gifted students is lacks specificity for mathematically gifted students (Handal, Watson, & Maher, 2015; Ihrig, Lane, Mahatma, & Assouline, 2018; Kurth & Forber-Pratt, 2017; Li, Liu, DeBey, McFadden, & Pan, 2018; Miller, Ramirez, & Murdock, 2017; Tofel-Grehl & Callahan, 2017). Morris (2013) specifically called for more qualitative studies that result in recommendations for teachers of gifted students. Therefore, I conducted this study to address research gaps that exist with respect to exploring the experiences of teachers who work with mathematically gifted students, and to answer the need for more qualitative studies on teachers'

experiences. The findings from this qualitative investigation have the potential to help educators improve teacher job satisfaction in relation to mathematics instruction for gifted students who may make significant contributions to the field of mathematics that benefit society. Additionally, educators may improve the mathematics learning of gifted students in inclusive classrooms if teachers believe they are capable of meeting the learning needs of mathematically gifted students.

Chapter 1 is an introduction to this study. It includes a brief summary of the research literature related to the scope of this study, a description of the research gap, and an explanation of why this study is needed. Additionally, the chapter includes a description of the problem statement, the purpose of the study, the research questions, and the conceptual framework. The chapter also includes a description of the nature of the study, definitions, assumptions, the scope and delimitations, and the limitations of the study. The chapter concludes with a description of the significance of the study and a chapter summary.

Background

K–12 schools in the United States (Morris, 2013) and globally (Oswald & de Villiers, 2013) are failing to meet the needs of their gifted students. This is especially apparent with respect to gifted students from minority populations and from economically disadvantaged areas (Ihrig et al., 2018; Smith & Campbell, 2016). Global support of giftedness, especially in the science, technology, engineering, and math (STEM) fields, is necessary to meet present and future challenges in society (Dailey, Cotabish, & Jackson, 2018; DeFraine, Williams, & Ceci, 2014; Kaplan & Hertzog, 2016;

Monei & Pedro, 2017; Mulcahy, Krezmien, & Travers, 2016; Trna & Trnova, 2015; Wilson, 2018). Gifted students possess creativity and leadership traits that allow them to make a positive impact on society (Bakar, Ishak, & Abidin, 2013; Wilson, 2018). If gifted students' needs are appropriately developed, student performance in some areas could increase up to 25% (Trna & Trnova, 2015). The emotional needs of gifted students should also be considered if STEM talent is to be recruited and retained; at the college level, both women and men are choosing to leave STEM fields if a work-life balance cannot be achieved (DeFraine et al., 2014; Heilbronner, 2013).

Factors that contribute to inadequately meeting the needs of gifted students in the United States include the existence of multiple definitions of giftedness (Foreman & Gubbins, 2015; Horne & Shaughnessy, 2013; McGowan, Holtzman, Coyne, & Miles, 2016; Renzulli, 2005, 2012), the numerous ways schools attempt to identify gifted students (Renzulli, 2005, 2012), and the absence of a federal mandate that requires schools to identify or provide services to gifted students (National Association for Gifted Children, 2013; Pereira, Knotts, & Roberts, 2015). The pressure that teachers feel to prepare students to achieve on high-stakes standardized assessments may also play a role in how teachers deliver constricted curricula to gifted students (Flint, 2014). Gifted students are not homogeneous in nature, and possess a wide variety of academic and affective needs (Bakar et al., 2013; Horne & Shaughnessy, 2013; Ishak, Hakimie, Abidin, Yazid, & Bakar, 2013; Kerr & McKay, 2013; Morris, 2013; Tay, Salazar, & Lee, 2018; Trna & Trnova, 2015; Yurt & Kurnaz, 2015).

Many gifted students in the United States are educated in inclusive classrooms (Fruth & Woods, 2015; Individuals with Disabilities Education Act, 2004; Ozdemir, 2018), where teachers are expected to meet a wide range of student needs (Alderton & Gifford, 2018; Faragher et al., 2017; Sheehey et al., 2017). Teachers of gifted students are not receiving the gifted or mathematics professional development they need to appropriately challenge and nurture gifted students, especially those in inclusive mathematics classrooms (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). As a result, gifted students are not realizing their full potential (Bayok, Aydemir, & Uyaroglu, 2013; Morris, 2013; Ozdemir, 2018; Trna & Trnova, 2015), and their teachers are seen as ineffective. This can cause frustration for both students and teachers; gifted students report often feeling bored in school, especially in inclusive secondary classrooms (Bayok et al., 2013; Morris, 2013; Mullet, Kettler, & Sabatini, 2018; Ozdemir, 2018).

Teachers are the most important school-related factor that contributes to student success (Council for Exceptional Children, 2013; Ekstam, Korhonen, Linnanmaki, & Aunio, 2017; Muijs et al., 2014; Shaunessy-Dedrick & Cotabish, 2014). Researchers have also suggested that effective teachers must possess appropriate content knowledge and a variety of strategies for teaching problem-solving skills (Alterator, Deed, & Prain, 2018; Brisson et al., 2017; Flint, 2014; Mathews, 2017; Merritt, Lee, Rillero, & Kinach, 2017; Mun & Hertzog, 2018). While teachers who are unprepared to meet the needs of gifted students in their classes may experience frustration, teachers who are effective report an increase of efficacy and job-satisfaction (King-Sears & Baker, 2014). Chang (2015)

suggested that when teachers receive appropriate training, they experience increased teaching self-efficacy, which may lead to gains in student achievement and school climate. Teachers should be trained in ways to identify and develop giftedness, including how to create effective support systems with school personnel and students' families (Kaplan & Hertzog, 2016; Karsenty, 2014; Trna & Trnova, 2015). Teachers are willing to differentiate instruction to meet the needs of their students when they are provided with training and resources to do so (Rubenstein et al., 2015). Teacher preparation programs can have a positive impact on teacher performance (Griffin et al., 2018; Handal et al., 2015; Katz & Stupel, 2016; Leavy & Hourigan, 2018; Levi-Keren & Patkin, 2016; Shuilleabhain & Seery, 2018; Tortop, 2014).

Teachers' beliefs and attitudes influence their instructional approaches, teaching effectiveness, and student motivation (Bandura, 1993; Chang, 2015; Gerde, Pierce, Lee, & Van Egeren, 2018; Lazarides, Buchholz, & Rubach, 2018; Looney, Perry, & Steck, 2017; Miller et al., 2017). Bandura's (1977) social cognitive theory states that individuals' understanding of a given social situation is influenced by the perceptions the individual holds about the nature of the relationships displayed within that situation. Social cognitive theory served as the conceptual framework for this study. Social-cognitive theory suggests that a teacher's self-efficacy with regard to meeting the needs of gifted students in the classroom is a leading predictor of the teacher's effectiveness. Bandura (1997) found that a person's perception about a situation can be a leading factor in determining how that person will respond to the situation. As a result, teachers'

perceptions with regard to their ability to meet the needs of gifted learners in their classes may be a powerful predictor of student success.

Gerde et al. (2018) suggested that early childhood educators have the highest teacher self-efficacy in literacy, significantly lower teacher self-efficacy in science, and the lowest levels of teacher self-efficacy in mathematics. At the secondary level, teacher self-efficacy varies with the mathematics course being taught (Sarac & Aslan-Tutak, 2017). Professional development can increase levels of teacher efficacy (Katz & Stupel, 2016); therefore, it is critical to gain a better understanding of teacher efficacy with regard to meeting the needs of gifted students in inclusive mathematics classrooms, and to use the findings to improve teacher training and student performance.

Student self-efficacy appears to decline in Grade 7 or earlier, resulting in decreased math achievement for some students (Chang, 2015). Increased levels of teacher efficacy lead to higher levels of student motivation (Lazarides et al., 2018) and lower levels of student mathematics anxiety (Bong, Hwang, Noh, & Kim, 2014; Yurt & Kurnaz, 2015); this is especially true with female students, and students who are lower achievers in mathematics (Ernest, 2016).

I conducted this study to address research gaps that exist with respect to exploring the experiences of teachers who work with mathematically gifted students, and to partially satisfy the need for more qualitative studies that result in recommendations for teachers of gifted students. The findings from this qualitative investigation have the potential to help educators improve teacher job satisfaction in relation to mathematics instruction for gifted students who may make significant contributions to the field of

mathematics that benefit society. Additionally, educators may improve the mathematics learning of gifted students in inclusive classrooms if teachers believe they are capable of meeting the learning needs of mathematically gifted students. This study was needed to improve the learning experiences of gifted students in inclusive classrooms, as well as the teaching experiences of the teachers who work with them.

Problem Statement

Teacher preparation programs often provide insufficient training to meet the needs of gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). This inadequate preparation is especially true in inclusive classrooms where teachers are responsible for delivering instruction to students with a wide range of academic abilities and social needs (Alderton & Gifford, 2018; Everett, 2017; Faragher et al., 2017; Kurth & Forber-Pratt, 2017; Rubenstein et al., 2015; Sheehey et al., 2017; Van Ingen et al., 2016). As a result, teachers of gifted students may not feel adequately prepared to meet the needs of these students in their classrooms. Teachers often find meeting the unique needs of gifted learners to be challenging, especially because gifted students do not make up a homogeneous group and have a wide variety of social and academic needs (Bakar et al., 2013; Horne & Shaughnessy, 2013; Ishak et al., 2013; Kerr & McKay, 2013; Morris, 2013; Tay et al., 2018; Yurt & Kurnaz, 2015).

Teacher anxiety that results from failing to meet the needs of such students can lead to decreased job performance and overall career dissatisfaction (King-Sears & Baker, 2014). In inclusive classrooms, teachers are charged with the task of ensuring that all students, who represent a wide spectrum of ability levels, achieve adequate levels of

academic growth for the school to achieve adequate yearly progress (AYP; King-Sears & Baker, 2014). In addition, teachers may not know how to provide appropriately challenging educational experiences for gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). Inadequate preparation for teaching gifted students, combined with current methods of calculating teacher and school effectiveness, often lead to increased teacher anxiety and frustration about providing instruction for gifted students (King-Sears & Baker, 2014). Thus, even though prior researchers explored the beliefs of gifted students concerning instruction in inclusive classrooms (Bayok et al., 2013; Morris, 2013; Mullet et al., 2018; Ozdemir, 2018), a gap exists concerning teacher beliefs about providing instruction for gifted students in inclusive classrooms, particularly related to mathematics (Celik et al., 2018).

Purpose of the Study

The purpose of this qualitative, phenomenological study was to explore the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms. My goal for this study, grounded in Bandura's (1977, 1986) social cognitive theory, was to offer recommendations for improving teacher job satisfaction in relation to providing appropriate learning experiences for gifted students in inclusive settings. I described the factors that teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms. I also described the perceptions of teachers regarding how their professional development influences the academic achievement of these students.

Research Questions

The research questions for this study were based on Bandura's (1977, 1986, 1997) social cognitive framework and the literature review for this study.

1. What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?
2. What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?
3. What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?

Conceptual Framework

The conceptual framework for this study was based on Bandura's (1977, 1986, 1997) social cognitive theory, which seeks to explain human learning in a naturalistic setting. In this comprehensive theory, Bandura (1997) identified both social and cognitive factors that influence learning, particularly in relation to the role of models in modifying behavior. Bandura (1997) also presented specific principles of learning, including self-efficacy, which he defined as "beliefs in one's capabilities to organize and execute the courses of action to produce given attainments" (p. 3). Bandura (1977, 1986) argued that four types of influence contribute to individuals' beliefs about their personal efficacy: mastery experiences, vicarious experiences, verbal persuasion, and physiological and emotional states. Bandura (1977, 1986) determined that mastery experiences provide the most authentic evidence of the individual's capabilities to obtain the resources needed for

success, and vicarious experiences are particularly influential when direct experience is not available. In addition, Bandura (1977, 1986) argued that verbal persuasion could be used to counter an individual's self-doubts, and that physiological and emotional states could be used to provide information about self-efficacy. Bandura (1977, 1986, 1997) also contended that individuals who have high self-efficacy are often more motivated than individuals with low self-efficacy to persevere when difficulties arise. Although it is possible for individuals with high self-efficacy to overestimate their capabilities, Bandura (1986) suggested that even these individuals often experience significant personal growth because they are motivated to put forth additional effort. A more detailed explanation of the tenets of this conceptual framework, how it is articulated in current research, and how it benefits this study is provided in Chapter 2.

Nature of the Study

This study was qualitative in nature and included a transcendental phenomenological design. Patton (2015) defined phenomenological research as qualitative research focused on discovering the common lived experiences of individuals in relation to a central concept or phenomenon. Phenomenology is the qualitative design that is best suited for the type of investigation that seeks to understand individuals' common lived experiences. In transcendental phenomenology, the researcher removes personal thoughts and opinions from the study to gain an understanding of the lived experiences of the participants with regard to the phenomenon being explored (Moustakas, 1994). I chose the transcendental phenomenological design because I wanted

to keep my experiences and beliefs separate from the data I collected to understand the phenomenon through the participants' experiences.

I conducted initial and follow-up interviews when collecting data for this phenomenological study. In this study, participants included 12 teachers who provide mathematics instruction in inclusive classrooms with identified gifted students. I stopped recruiting participants once data saturation was achieved as recommended by Merriam (2009) and Patton (2015). These inclusive classrooms were located in five public school districts located in Eastern Pennsylvania. Researchers should strive for maximum variation in their sample (Merriam, 2009; Moustakas, 1994). I aimed to recruit a target of three elementary school mathematics teachers, a target of three middle school mathematics teachers, and a target of three high school mathematics teachers as participants. Creating a target value instead of an exact number of participants at each grade level allowed me to have some flexibility with regard to the actual number of teachers who chose to participate in my study as well as the number of participants required at each grade level until data saturation was reached. I reached data saturation after I interviewed five elementary school mathematics teachers, two middle school mathematics teachers, and five high school mathematics teachers.

In phenomenological studies, participants are often referred to as research partners (Moustakas, 1994). To identify potential research partners after Walden University Institutional Review Board (IRB) approval (Approval No. 11-01-18-0175506), I emailed superintendents of public school districts located in eastern Pennsylvania explaining the purpose of this study and seeking approval to collect data

(see Appendix A). Upon receiving permission from a school district's superintendent (see Appendix B), I used the school district's website to identify potential participants. To avoid potential conflicts of interest, I excluded teachers from this study who were currently employed at the same school building as my husband, as well as teachers who currently or formerly had my daughters as students. Potential participants were purposefully determined based on the following inclusion criteria so that I could be sure they had experienced the phenomenon being studied: (a) all participants must be employed as mathematics teachers at their respective research site; (b) all participants must provide instruction in mathematics in inclusive classrooms, which are defined as classrooms where all students learn together, including regular education students, gifted students, and students with disabilities; and (c) all participants must provide instruction to some students in these classrooms who are identified as gifted. I emailed the school principals asking them to help me determine those teachers who meet the inclusion criteria. From this list of potential participants, I emailed the teachers at the school district who met the inclusion criteria, informing them of my study and inviting them to participate if they were interested (see Appendix C). To achieve a diverse sample population with regard to grade level taught, I selected the first two to four teachers at each level (elementary, middle, and high school) who expressed an interest in participating in this study by returning a signed consent form to me.

I designed the initial and follow-up interview questions used to collect data from participants during individual interviews and had the questions reviewed by a panel of experts (see Appendix D). The final interview protocol is located in Appendix E. I

conducted interviews in person, using web-based technology, or via telephone, and audio-recorded them so that they could be transcribed. In-person interviews were my preferred choice because of the importance of establishing personal connections and trust with study participants as recommended by Moustakas (1994). If in-person interviews were feasible, they were conducted at the participant's school site, in their classroom, during non-instructional hours. Otherwise, I conducted interviews via web-conference or telephone. In addition to the initial and follow-up interviews, I asked participants to review the tentative findings of the study for their credibility. Initial interviews lasted between 45–75 minutes, and follow-up interviews lasted between 20–35 minutes. The final member review of the tentative findings was completed via email communication, to ensure consistency with the participants' intent. I analyzed data using a modification of the Van Kaam method for phenomenological data that Moustakas (1994) recommended. I analyzed the data in relation to the central and related research questions and interpreted in relation to the conceptual framework and the literature review.

Definitions

Essence: A phenomenological concept that refers to a shared experience among study participants (Moustakas, 1994).

Gifted students: Students who show evidence of high achievement capabilities in areas such as intellectual, creative, artistic, or leadership capacities, or in specific academic fields, and who need services or activities not normally provided by the school to fully develop those capabilities (National Association for Gifted Children, 2008).

Inclusive classroom: A classroom "in which students with disabilities and students without disabilities learn side-by-side" (Fruth & Woods, 2015, p. 351).

Lived experiences: People's direct individual experiences as opposed to secondhand experiences (Patton, 2015).

Professional development: "A wide variety of specialized training, formal education, or advanced professional learning intended to help administrators, teachers, and other educators improve their professional knowledge, competence, skill, and effectiveness" (Glossary of Education Reform, 2013, para. 1).

Self-efficacy: "Belief in one's capabilities to organize and execute the courses of action to produce given attainments" (Bandura, 1997, p. 3).

Student self-efficacy: A student's "belief in her/his capabilities to organize and execute the courses of learning" (Bandura, as cited in Chang, 2015, p. 1308).

Teacher self-efficacy: "Teachers' perception of their ability to effectively influence student learning" (Carney, Brendefur, Thiede, Hughes, & Sutton, 2016, p. 548).

Assumptions

This study was based on several assumptions. The first assumption was that teachers would feel comfortable enough to discuss the details of their lived experiences. This assumption was important to this study because teacher interviews were the sole source of data for this study. The second assumption was that teachers would provide honest responses to the interview questions. This assumption was important to this study because the data analysis focused on teacher responses to the interview questions, which impacted the credibility of the findings. The third assumption was that students would be

correctly identified as mathematically gifted. This assumption was important because the findings of this study relied on teachers' perceptions of meeting the needs of students who are accurately identified as mathematically gifted. The fourth assumption was that there is an essence that exists with respect to the shared experience of teaching gifted students in inclusive mathematics classrooms. I assumed that teachers had a common experience from which they could inform the research. The assumption was in line with the recommendations of methodological scholars on the foundation of phenomenological research (Merriam, 2009; Moustakas, 1994; Patton, 2015).

Scope and Delimitations

The study population included K–12 teachers in public schools in the United States who provide mathematics instruction in inclusive classrooms to students identified as gifted. This study sample included 12 teachers from eight schools in five public school districts in Eastern Pennsylvania. The study was conducted during the 2018–2019 school year.

Transferability is "concerned with the extent to which the findings of one study can be applied to other situations" (Merriam, 2009, p. 223). Several factors may affect the transferability of this study. First, transferability may be limited to school districts of similar size in the United States. In addition, transferability may be limited to school districts with similar student populations with respect to socioeconomic status and racial diversity. Schools across the United States vary with respect to size, socioeconomic status of their population, and racial diversity. Transferability of this study may also be limited to teachers with specific backgrounds, including race and length of teaching experience.

Because participation in this study was voluntary, it is possible that only teachers who are passionate about their profession were willing to participate.

Limitations

Limitations of a qualitative study are often related to the design or methodological weaknesses inherent to the study. This study had several potential limitations. The first possible limitation was the potential for researcher bias. As the sole researcher, I was responsible for all data collection and analysis, which could result in biased findings. I used strategies to improve the trustworthiness of this qualitative study, such as reflexivity (see Merriam, 2009). Chapter 3 presents a more detailed description of these strategies.

The second possible limitation was related to the sample size. Because of time and resource constraints, qualitative phenomenological studies typically call for a small number of interviews. The sample size of 12 participants from schools in close proximity to each other could limit the transferability of the findings, because participants may share common lived experiences with few differences. A small sample size can also limit the diversity of the sample with respect to teacher gender, race, age, and years of teaching experience. I attempted to create as diverse a sample as possible from the potential participants I was able to recruit.

The third possible limitation is related to data collection. Conducting only one initial interview and one follow-up interview with each participant may have posed a limitation. With only two interviews for each participant, it is possible that the findings may not fully address the research problem. More meaningful data might be collected if additional interviews and longer interviewing time were possible. In order to address this

limitation, I completed member checks with each participant after the two interviews were transcribed. This process is described in greater detail in Chapter 3.

A fourth possible limitation is related to the timeframe in which the study was conducted. Data collection took place over a short period of time, which had the potential to constrict the results. If a longer data collection timeframe were possible, teacher interviews might reveal a greater diversity in responses, specifically with regard to questions dealing with experiences of teaching gifted students in inclusive mathematics classrooms. The more time a teacher engages with students, the greater number of experiences can be reported. To address this limitation, participants were given an opportunity to record additional thoughts that occurred between interviewing periods through the process of memoing.

Significance of the Study

The significance of a study is determined in relation to advancing knowledge in the field, to improving practice, and to contributing to positive social change. In relation to advancing knowledge, this qualitative study may provide a deeper understanding of teacher beliefs about providing instruction in inclusive mathematics classrooms for students identified as gifted in mathematics. In terms of improving practice, this study may be used by educators to improve teacher preparation programs, particularly related to mathematics instruction for gifted students. In relation to positive social change, educators may use the findings from the study to improve teacher job satisfaction in relation to mathematics instruction for gifted students who may make significant contributions to the field of mathematics that benefit society. If teachers believe they are

capable of meeting the learning needs of mathematically gifted students they may foster more effective mathematics learning for gifted students in inclusive classrooms.

Summary

This chapter provided an introduction to this study, including the background of the study, a brief summary of the literature related to the study, a description of the research gap, and an explanation of why this study is needed. This chapter also included the problem statement, purpose of the study, research questions, and conceptual framework of the study. In addition, this chapter included a description of the nature of the study, definitions, assumptions, the scope and delimitations, and the limitations of the study. The chapter concluded with a description of the significance of the study.

Chapter 2 provides a review of the literature relevant to this study. The chapter includes a description of the literature search strategy, a description of the conceptual framework, and the literature review. In the literature review, I address the research on giftedness; the identification of gifted students; legislation related to educating gifted learners; the needs of gifted learners; experiences of gifted learners; programs and interventions for gifted learners; inclusive classrooms; effective teachers; teacher training and professional development; teachers' experiences, attitudes, and beliefs and their impact on instruction; and gaps related to the current study. Chapter 2 concludes with a summary and conclusions.

Chapter 2: Literature Review

Teacher preparation programs often provide insufficient training to meet the needs of gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). This inadequate preparation is especially evident in inclusive classrooms where teachers are responsible for delivering instruction to students with a wide range of academic abilities and social needs (Alderton & Gifford, 2018; Everett, 2017; Faragher et al., 2017; Kurth & Forber-Pratt, 2017; Rubenstein et al., 2015; Sheehey et al., 2017; Van Ingen et al., 2016). Teachers of gifted students may not feel adequately prepared to meet the needs of these students in their classrooms. Teachers often find meeting the unique needs of gifted learners to be challenging, especially because gifted students do not make up a homogeneous group and have a wide variety of social and academic needs (Bakar et al., 2013; Horne & Shaughnessy, 2013; Ishak et al., 2013; Kerr & McKay, 2013; Morris, 2013; Tay et al., 2018; Yurt & Kurnaz, 2015). Teacher anxiety that results from failing to meet the needs of gifted students can lead to decreased job performance and overall career dissatisfaction (King-Sears & Baker, 2014). In inclusive classrooms, teachers are charged with the task of making sure that all students, who represent a wide spectrum of ability levels, achieve adequate levels of academic growth to ensure the school achieves AYP (King-Sears & Baker, 2014). Teachers may not know how to provide appropriately challenging educational experiences for gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). Inadequate preparation for teaching gifted students, combined with current methods of calculating teacher and school effectiveness, often lead to increased teacher anxiety and

frustration about providing instruction for gifted students in their classrooms (King-Sears & Baker, 2014). Thus, even though prior research has been conducted to explore the beliefs of gifted students concerning instruction in inclusive classrooms (Bayok et al., 2013; Morris, 2013; Mullet et al., 2018; Ozdemir, 2018), a gap exists concerning teacher beliefs about providing instruction for gifted students in inclusive classrooms, particularly in relation to mathematics (Celik et al., 2018).

The purpose of this qualitative, phenomenological study was to explore the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms. My goal for this study, grounded in Bandura's (1977, 1986) social cognitive theory, was to offer recommendations for improving teacher job satisfaction related to providing appropriate learning experiences for gifted students in inclusive settings. Using data collected through semistructured interviews with teachers of gifted students, I described the factors that teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms. I also described the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students.

This chapter contains a review of the literature relevant to this study. It includes a description of the literature search strategy followed by a description of the conceptual framework and the literature review. The literature review begins with a description of issues that contribute to the complex nature of gifted education. First, I present the research that addresses the definition of giftedness. Next, I discuss the issues surrounding the identification of gifted students. Finally, I present the research as it relates to the

definition of giftedness, the identification of gifted students, the needs of gifted learners, the current state of gifted education, the heterogeneous versus homogeneous classroom debate, characteristics of effective teachers, measuring the effectiveness of teachers, professional development for teachers of gifted students, the role of teachers' beliefs and attitudes in their instructional approaches, the impact of teaching gifted students on teachers, and gaps related to the current study. This chapter concludes with a summary and conclusions.

Literature Search Strategy

To conduct the literature review, I gathered research by using keyword searches of peer-reviewed scholarly articles through online academic databases. I accessed several databases through the Walden University Library. These databases included Education Source, ERIC, SAGE Journals, and Thoreau Multi-Database Search. I also used the Google Scholar search engine. While I was conducting the literature review for this study, it became apparent that a limited amount of recent research has been conducted on teacher self-efficacy as it relates to the instruction of gifted students in inclusive mathematics classrooms. As a result, I expanded my search to include other relevant facets of gifted education that would help inform the research questions and future recommendations of this study. Searches were conducted using keywords related to the research questions of this study and included: *teacher belief, teacher perception, gifted, enrichment, inclusion, inclusive, self-efficacy, mathematics, math, programs, student achievement, training,* and *STEM.* I limited my search to include articles published in the last 5 years. Additionally, I obtained books related to qualitative research,

phenomenology, and the conceptual framework from Amazon, AbeBooks, and other online booksellers.

Conceptual Framework

I conducted this study to address the lived experiences of teachers who provide instruction to gifted students in inclusive mathematics classrooms. For the purpose of this study, inclusive classrooms refer to general education classrooms in which students of all abilities are educated together, including special education and gifted students. I used Bandura's (1977, 1986, 1997) social cognitive theory as the conceptual framework based on the precedent set in previous studies on teacher self-efficacy (see Almarode et al., 2014; Bages, Verniers, & Martinot, 2016; Chang, 2015; Ekstam et al., 2017; Gerde et al., 2018; Kim, Dar-Nimrod, & MacCann, 2017; King-Sears & Baker, 2014; Looney et al., 2017; Lopez-Agudo & Marcenaro-Gutierrez, 2017; Miller et al., 2017; Nurlu, 2015; Riconscente, 2014; Rutherford, Long, & Farkas, 2017; Sarac & Aslan-Tutak, 2017; Tortop, 2014; Yurt & Kurnaz, 2015). Renzulli's (2005, 2012) giftedness theory also appeared frequently in recent research (see Almarode et al., 2014; Andersen & Cross, 2014; Foreman & Gubbins, 2015; Heilbronner, 2013; Horne & Shaughnessy, 2013; Morris, 2013; Ozdemir, 2018; Rothenbusch, Voss, Golle, & Zettler, 2018; Smith & Campbell, 2016; Sternberg, 2018; Swanson & Lord, 2013; Tay et al., 2018; Tofel-Grehl & Callahan, 2017; Trna & Trnova, 2015; Wilson, 2018) and is addressed in the literature review portion of this chapter.

Conceptual Lens: Bandura's Social-Cognitive Theory

Bandura's (1977, 1986, 1997) social cognitive theory is particularly relevant with respect to teacher self-efficacy. Bandura (1997) believed that "the task of creating learning environments conducive to development of cognitive competencies rests heavily on the talents and self-efficacy of teachers" (p. 240). Bandura (1993) suggested that teacher efficacy is linked to the academic performance of students. In relation to instrumentation, I utilized Bandura's (1977, 1986) four sources of self-efficacy to design the interview protocol for this study and as the conceptual lens through which the data were interpreted in Chapter 5. In this section, I describe Bandura's (1977) social-cognitive theory in relation to the nature of the learning process, outcomes of learning, the behavioral model, the consequences of behavior, the learner's internal processes, the role of self-efficacy, and the self-regulatory system. I also discuss implications of this research for instruction.

Nature of the learning process. Unlike other theorists who believed that learning is a result of stimulus and response behaviors, Bandura (1977) suggested that learning is explained by a relationship between three factors: a learner's behavior, the environment, and personal events. German psychologist Lewin proposed these same three factors in his own explanation of learning (Lewin, 1939). Bandura believed these three factors interact with each other in an interlocking relationship referred to as reciprocal determinism. Bandura believed that personal events determine an individual's behavior, triggering new environmental events and resulting in an increase in the individual's self-confidence, which then influences future behaviors.

Outcomes of learning. Bandura's (1977) social-cognitive theory operates on the assumption that individuals first gain information through observing others, leading to decisions about which behaviors to exhibit in the future. Social-cognitive theory differs from behavioral theories that suggest that to determine learning has occurred, a related behavior must be performed (Bandura, 1977). Bandura's social-cognitive theory suggests that as a result of learning, people acquire internalized behavior codes that may either remain internalized or may emerge at a later time. Bandura believed that learning and performance are viewed as two separate events. Learning occurs when verbal or visual codes are acquired, even though these codes may or may not be exhibited by the individual at a later time (Bandura, 1977).

Behavioral models. A learning model can be defined as a stimulus that a learner observes and processes, prompting a decision to select an appropriate course of action (Bandura, 1977). A number of different types of behavioral models contribute to learning. Bandura (1977) described two predominant types of models: live models and symbolic models. Live models are those people with whom an individual has direct contact, and symbolic models include visual representations of behaviors and people with whom an individual does not have direct contact. In relation to social-cognitive theory, Bandura suggested that a main function of behavioral models is to transmit information to others. This transmission could result in three different effects. First, modeled behavior may trigger similar positive or negative behaviors in others. Positive behaviors include mimicking appropriate social skills, and negative behaviors include copycat crimes. The second effect of modeling is that it can strengthen or weaken tendencies for people to

exhibit particular behaviors. Punishment and negative consequences serve to increase restraints, while lack of punishment or long-term exposure to certain negative behaviors weakens restraints. The third and final effect of modeling is to influence new behavior patterns by providing individuals with a variety of new social situations (Bandura, 1977).

Bandura's (1977) social-cognitive theory suggests that three factors influence an individual's responsiveness to a behavior model: (a) the attributes of a model, such as social status and prestige; (b) the level of uncertainty about possible consequences of an action; and (c) the level of intrinsic reinforcement already present in the individual regarding that type of situation. An additional factor that contributes to the effectiveness of a behavioral model is the personality of the observer. Bandura (1986) suggested that individuals who are outgoing and confident will be more responsive to modeling opportunities than those individuals who are insecure.

Consequences of behavior. Consequences can have a notable effect on an individual's behavior. Bandura (1977) suggested that the most basic learning occurs as a result of people dealing with everyday events, through the process of observing consequences to determine which behaviors should be adopted and which behaviors should be abandoned. The three categories of consequences that Bandura addressed in social-cognitive theory include vicarious consequences, direct consequences, and self-administered consequences. Bandura defined vicarious consequences as those consequences that occur when an individual observes behaviors in others. For example, an observer will notice when someone else's behavior immediately receives positive or negative reinforcement, and the observer formulates a positive or negative emotional

reaction to that reinforcement. Direct consequences occur when an individual mimics an observed behavior and experiences the consequences firsthand. Finally, imitated behavior can lead to self-administered consequences, which is the third type of consequences mentioned in social-cognitive theory. It should be noted that the absence of punishment could also serve to reinforce imitated behaviors (Bandura, 1977).

Internal learning processes. Bandura (1977) believed that an individual's behavior largely relies on the person's ability to store information into memory and recall that information in appropriate situations. According to social-cognitive theory, Bandura contended that four components determine an individual's ability to learn and perform: attention, retention, motor production, and motivational processes. The first step in this learning and performance cycle is attention, which is a necessary component of behavior acquisition, because an individual must first be able to observe and accurately interpret a behavior before committing it to memory and repeating it. Once a behavior is observed and interpreted, the second step in the learning and performance cycle is that the retention process must be activated for learning to occur; a learner must be able to code the observations and analysis and commit them to memory. The third step is reproduction; after a modeled behavior has been observed and stored into memory, an individual must have the physical ability to reproduce that behavior in appropriate situations. The final component in this learning and performance cycle is motivation; prior experience with positive and negative consequences serves as a motivator for the learner to perform the learned behaviors (Bandura, 1977).

Role of self-efficacy. Bandura (1997) defined self-efficacy as "beliefs in one's

capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Self-efficacy beliefs play an important role in determining the risks people take and the activities they are willing to attempt (Bandura, 1993). Self-efficacy also plays a key role in academic success because it determines a learner's belief that the individual will be able to successfully complete a given learning task. Four factors determine self-efficacy beliefs: (a) mastery experiences, (b) vicarious experiences, (c) verbal persuasion, and (d) physiological and emotional states. Self-efficacy improves when learners experience success in challenging mastery experiences, rather than easy tasks. Individuals become quickly discouraged by failures if success has always come to them easily, with little effort required on their part. Self-efficacy is also strengthened when individuals are placed in unfamiliar or novel situations and observe the vicarious experiences of others, especially those individuals viewed as peers. Self-efficacy improves through verbal persuasion, although this source may only be effective when the learner's self-doubts are minor. A fourth determinant of self-efficacy beliefs is an individual's physiological and emotional state; people with high self-efficacy have a tendency to use stress and tension as motivators for sustained efforts (Bandura, 1997).

In summary, Bandura (1997) believed that self-efficacy determines the activities, tasks, and situations that individuals are willing to attempt; people tend to avoid situations and activities they feel are beyond their control. Individuals with high self-efficacy tend to persevere when confronted with difficulties, provide sustained effort and attention in demanding situations, experience minimal stress, and set challenging goals for themselves. Conversely, people who possess low self-efficacy tend to decrease effort

or even give up in difficult situations, suffer from stress and anxiety, avoid potentially enriching activities, and avoid setting challenging goals for themselves (Bandura, 1997).

Self-regulatory system. Bandura (1986) suggested that the most important factor in an individual's achievement of complex learning is that person's self-regulatory system. Bandura described self-regulation as a cycle comprised of three subprocesses: (a) self-observation, (b) self-judgment, and (c) self-reaction. Self-observation occurs when the individual focuses sustained self-attention on the individual's behavior. Self-judgment occurs when an individual reflects on self-performance in relation to pre-determined short- or long-term goals. Self-reactions are an individual's feelings towards the amount of progress or lack of progress the person has made. Bandura (1993) defined self-regulated learning as the process of applying and adapting self-generated thoughts, emotions, and actions towards achieving personal goals. Self-regulated learners are individuals who are able to set goals, self-monitor behaviors, and select appropriate learning strategies. Bandura believed that when public acknowledgement is not provided or is unavailable, a person's ability to maintain effort is dependent upon self-reinforcement practices. For this reason, Bandura believed that self-efficacy has a major influence on an individual's ability to self-regulate.

Benefits to this Study

Bandura's (1977, 1986, 1997) social cognitive theory, particularly in relation to self-efficacy, is important to this study because the framework is helpful for understanding a teacher's willingness to persevere in the face of the instructional challenges for students identified as gifted in mathematics who are present in a full

inclusion classroom. I used Bandura's (1977, 1986, 1997) sources of self-efficacy to justify the relevance of this study because it may explain factors that motivate teachers to improve their instructional practice for this vulnerable student population. I also employed social cognitive theory to understand how teachers' self-efficacy can be leveraged to improve mathematics learning for gifted students in inclusive classroom.

Literature Review

In this section, I describe research as it relates to the definition of giftedness, the identification of gifted students, and legislation related to educating gifted learners. I describe research related to the needs of gifted learners, experiences of gifted students, programs and interventions for gifted learners, and inclusive classrooms. I present research related to effective teachers, professional development for teachers, and teachers' experiences, attitudes, and beliefs and their impact on instruction. In the last part of this section I describe research gaps related to the study.

A Definition of Giftedness

One of the complexities surrounding gifted education stems from the existence of multiple working definitions of giftedness. While some researchers claim that creativity is a necessary component of giftedness (Renzulli, 2005, 2012), other researchers suggest that creativity is actually a type of giftedness in and of itself (Sternberg, 2000, 2005). While performing the literature review for this study, I located a number of peer-reviewed articles that referenced the work of Renzulli (2012) and used Renzulli's definition of giftedness as a background for their individual studies (see Almarode et al., 2014; Andersen & Cross, 2014; Foreman & Gubbins, 2015; Heilbronner, 2013; Horne &

Shaughnessy, 2013; Morris, 2013; Ozdemir, 2018; Rothenbusch et al., 2018; Smith & Campbell, 2016; Sternberg, 2018; Swanson & Lord, 2013; Tofel-Grehl & Callahan, 2017; Tay et al., 2018; Trna & Trnova, 2015; Wilson, 2018). Therefore, I also applied Renzulli's definition of giftedness to the study and explain it in detail in this section. Renzulli's definition of giftedness and related four-part theory of talent development are also used to inform recommendations that result from the findings of this study.

Renzulli's four-part theory of talent development. In this section, I describe Renzulli's (2012) four-part theory of talent development as it relates to the learning needs of mathematically gifted adolescent students. Before Renzulli developed his four-part theory of talent development, he spent over four decades pondering the questions, "What makes giftedness?" and "How do we develop it in young people?" (Renzulli, 2012, p. 152). Renzulli created his four-part theory of talent development based on his belief that there are three purposes of gifted education with respect to meeting societal needs. Renzulli suggested that the first purpose of gifted education is to provide youth with opportunities to develop inherent potential. The second purpose of gifted education is to help society solve contemporary problems by increasing the number of "producers of knowledge and art rather than mere consumers of existing information" (p. 151). The third purpose of gifted education is to design special educational programs and services to meet the needs of the people who will make significant contributions to society, rather than those students who are merely hard workers (Renzulli, 2012).

The following description of Renzulli's (2012) four-part theory of talent development begins with his definitions of giftedness, followed by the four parts of the

theory. The four parts of Renzulli's talent development theory are: (a) the three-ring conception of giftedness, (b) the enrichment triad model, (c) operation houndstooth, and (d) leadership for a changing world. Each of these four parts are discussed in detail in the following sections.

Giftedness and intelligence. A variety of definitions of giftedness exist in educational research. Renzulli (2012) argued that the programs and services required to develop the potential in students should be labeled, rather than labeling the students themselves. Renzulli added that he used the term gifted in adjective form, rather than in noun form, based on the root meaning of the word gifted, or "that which is given" (p. 151). Renzulli suggested that special services should be provided to both students who are cognitively advanced and who demonstrate "intelligences outside the normal curve" (p. 151). Renzulli (2005) was a proponent of multiple intelligence theories, and suggested that because there are many kinds of intelligence, it is too complicated to define giftedness based on intelligence scores alone. In addition, Renzulli (2005) concluded that an ideal way to measure intelligence has not yet been found, so even if a person's IQ score is calculated, his or her actual intelligence measurement may not be known.

Two kinds of giftedness. Renzulli's (2012) four-part theory of talent development operates on the premise that there are two types of giftedness that individuals can demonstrate. Renzulli called the first type of giftedness "high achieving or schoolhouse giftedness" (p. 151) which refers to individuals who perform well in a traditional school environment. Schoolhouse giftedness is the kind of giftedness that is most easily measured by IQ tests (Renzulli, 2005). Renzulli (2005) suggested that IQ scores and

school grades are typically positively correlated, but he warned that other factors besides test scores contribute to school success. The second type of giftedness is "creative-productive giftedness" (Renzulli, 2012, p. 151) and refers to attributes that creative individuals apply to areas of societal need. Renzulli (2005) defined creative-productive giftedness as "simply putting one's abilities to work on problems and areas of study that have personal relevance to oneself and that can be escalated to appropriately challenging levels of investigative activity" (p. 255). According to Renzulli (2005), history typically remembers people who demonstrated creative-productive giftedness over those people who scored well on IQ tests. There can be an overlap between the two types of giftedness in individuals, but Renzulli (2005) believed it is essential to distinguish between the types of giftedness to better develop gifted behaviors in educational environments. Renzulli (2005) emphasized three points with respect to the two types of giftedness. First, he suggested that both types of giftedness are important. Second, he noted that the two types of giftedness often interact with each other. Third, educational programs for children should acknowledge and support both genres of giftedness, in addition to providing opportunities when the two types of giftedness present themselves together (Renzulli, 2005).

Three-ring conception of giftedness. The first part in Renzulli's (2012) four-part theory of talent development is the three-ring conception of giftedness. Renzulli's three-ring conception of giftedness served as the background for a study on giftedness that appeared in the literature review (Foreman & Gubbins, 2015). Renzulli created the three-ring conception of giftedness subtheory to "portray the main dimensions of human

potential for creative productivity" (p. 153). The three interacting rings in this subtheory are: (a) above average ability, (b) task commitment, and (c) creativity. Renzulli suggested that these three traits continually interact with each other, and when exposed to a problem-solving situation, create the conditions required for "the creative productive process to commence" (p. 153). As defined by Renzulli, the above average ability cluster is the most constant of the three clusters and is made up of both general and specific performance areas. General performance areas include "verbal and numerical reasoning, spatial relations, memory" and specific performance areas include "chemistry, ballet, musical composition, experimental design" (Renzulli, 2012, p. 153). According to Renzulli, the task commitment cluster represents qualities consistently found in "creative productive" individuals. These qualities include "perseverance, determination, willpower, positive energy" (Renzulli, 2012, p. 153). This cluster exists because Renzulli believed that "one of the primary ingredients for success among persons who have made important contributions to their respective performance areas is their ability to immerse themselves fully in a problem or area for an extended period of time and to persevere even in the face of obstacles that would inhibit others" (p. 153). The third and final cluster in Renzulli's three-ring conception of giftedness is the creativity cluster of traits. The creativity traits include "curiosity, originality, ingenuity, and a willingness to challenge convention and tradition" (Renzulli, 2012, p. 153). Renzulli believed that although there have been numerous gifted scientists throughout the course of history the ones who have been most notable and impactful are those who applied their creativity in novel ways. According to Renzulli's three-ring conception of giftedness subtheory, the three rings overlap and

interact in a way that creates ideal conditions for creating giftedness in an individual. Renzulli viewed giftedness as a fluid set of behaviors rather than a fixed state of being, with the behaviors activated and demonstrated under certain circumstances as they are needed.

Enrichment triad model. The second part in Renzulli's (2012) four-part theory of talent development is the enrichment triad model. Renzulli claimed that all learning that takes place is the result of either deductive or inductive learning activities. Deductive learning represents most of the learning that takes place in classrooms, whereas inductive learning represents learning that generally takes place outside formal educational institutions. Deductive learning activities are intended to provide students with foundational learning that will later transfer to future problems, careers, or life activities; inductive learning activities require people to create products, engage in performances, or provide services (Renzulli, 2012). Renzulli claimed that deductive learning is not inherently wrong, but is limited in effectiveness because it fails to acknowledge varied student interests and learning styles. A strength of inductive learning is that knowledge and skills become instantly relevant to learners as they become necessary in the learner's role as a consumer, client, or other audience member (Renzulli, 2012). Renzulli created the enrichment triad model as a means of increasing inductive learning experiences in educational settings.

In the enrichment triad model, inductive learning goals are achieved as the three types of enrichment interact with each other (Renzulli, 2012). Type I enrichment activities are described as general exploratory activities that are meant to expose students

to a variety of learning possibilities (Renzulli, 2012). While engaging in Type I activities, Renzulli (2012) noted that students are exposed to problems, theories, skills, and ideas that are meant to serve as a "catalyst for curiosity and internal motivation" (p. 155). Renzulli suggested that Type I activities be made available to all students, as they are intended to generate inspiration within learners.

The next category of learning activities is Type II enrichment, which includes both individual and group training activities. According to Renzulli (2012), Type II activities are meant to help teach students how to transition from thought to action. These enrichment activities emphasize information gathering and skill development and prepare students to solve real-world problems and to produce tangible products. Type II enrichment should vary in complexity and rigor to align with students' academic and personal maturity levels. Renzulli suggested that Type II activities fall into the following five categories: (a) cognitive training, (b) affective training, (c) learning-how-to-learn training, (d) research and reference procedures, and (e) written, oral, and visual communication procedures. Renzulli noted that Type II activities can also serve to prepare students for entry into Type III enrichment.

The final category of learning activities in the enrichment triad model is Type III enrichment, which includes individual and small group investigations of real world problems (Renzulli, 2012). Like Type II enrichment, Type III activities should be differentiated according to student developmental levels. Renzulli (2012) suggested that all Type III activities encompass four specific student objectives. The first objective is for students "to acquire advanced-level understanding of the knowledge and methodology

used within particular disciplines, artistic areas of expression, and interdisciplinary studies" (Renzulli, 2012, p. 155). The second objective is for students "to develop authentic products or services that are primarily directed toward bringing about a desired impact on one or more specified audiences" (Renzulli, 2012, p. 155). The third objective is for students "to develop self-directed learning skills in the areas of planning, problem finding and focusing, management, cooperativeness, decision making, and evaluation (Renzulli, 2012, p. 155). The fourth and final objective is for students "to develop task commitment, self-confidence, feelings of creative accomplishment, and the ability to interact effectively with other students and adults who share common goals and interests (Renzulli, 2012, p. 155). During Type III enrichment, both students and teachers undergo a transformation of roles. Students transform from lesson learners to investigators and creators, and the teacher's role shifts "from that of instructor or disseminator of knowledge to some combination of coach, promoter, manager, mentor, agent, guide, and sometimes even colleague" (Renzulli, 2012, p. 155). It is during Type III enrichment that Renzulli believed everything comes together for students, from basic skills to higher-level processing.

Operation houndstooth: Gifted education and social capital. The third part in Renzulli's (2012) four-part theory of talent development is operation houndstooth. In this subtheory, Renzulli suggested that the relationship between an individual's personality traits and the environment influences a person's abilities, creativity, and commitment to a given task. Renzulli suggested that some of the most influential people in the world have not only been academically gifted and creatively productive, but they have also possessed

desirable traits for improving the lives of others. Renzulli referred to these additional qualities as "houndstooth" traits. These traits include "optimism, courage, romance with a topic or discipline, physical and mental energy, vision and a sense of destiny, and sense of power to change things" (Renzulli, 2012, p. 156). Renzulli suggested that if society wants leaders who will be committed to creating positive social change, gifted intervention models must include methods for promoting a sense of responsibility to society within young people. Presently, most gifted programs only attend to cognitive development; Renzulli suggested that it is equally important to promote co-cognitive qualities when attempting to develop youth giftedness.

Executive functions: Leadership for a changing world. The fourth and final part in Renzulli's (2012) four-part theory of talent development is the executive functions theory. Renzulli referred to this theory as the "yeast" that helps the other three models rise, and that this phase involves "getting your act together" (p. 156). Renzulli suggested that high IQs, creative ideas, and good motives may not produce results in the absence of leadership skills. Positive action results when "leadership skills such as organization, sequencing, and sound judgment are brought to bear on problem situations" (Renzulli, 2012, p. 156). Renzulli believed that executive functions are crucial to academic success, ranging from improved performance on educational assessments to positive consideration on college admission requirements. These skills are not only important for academic success, but are also critical in adulthood due to the positions of power to which many gifted people ascend. Renzulli listed five categories of executive functions that should be addressed by educational gifted intervention programs: (a) openness, (b)

conscientiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism. In addition, Renzulli developed a diagnostic instrument called *Rating the Executive Functions of Young People* to help educators identify and develop desirable leadership traits in students through gifted enrichment programs. While developing the diagnostic instrument, Renzulli's research revealed five general categories of factors that altruistic contributors to society possess. These five factors are: (a) action orientation, (b) social interactions, (c) altruistic leadership, (d) realistic self-assessment, and (e) awareness of the needs of others. Together, these behaviors are possessed by highly effective people are the traits that cause leaders in their respective fields to do what is considered to be the right thing. These are the traits that Renzulli proposed should be fostered in gifted enrichment programs. Renzulli emphasized that it is important to include executive functions in gifted programs because young people with high potential will likely take on important social and leadership roles as adults, where exhibiting these skills is critical to success. Based on the findings from my literature search, Renzulli's (2005, 2012) four-part theory of talent development served as the basis for much research in the realm of gifted education. His four-part theory of talent development was described in detail and served to inform recommendations that resulted from the findings of my study.

The Identification of Gifted Students

In addition to the existence of multiple working definitions of giftedness, another complexity surrounding gifted education stems from determining who is eligible to receive gifted services in the educational setting. A critical part in creating and providing educational programming for students is deciding who is eligible to receive the services

(Kerr & McKay, 2013; Trna & Trnova, 2015); this task becomes especially challenging when multiple definitions of giftedness exist (Foreman & Gubbins, 2015; Horne & Shaughnessy, 2013; McGowan et al., 2016). Recent research supports Renzulli's (2005, 2012) notion that giftedness is multifaceted and that strategies used to identify gifted students must reflect that multidimensionality by acknowledging student IQ, specific intellectual ability, and intellectual creativity (McGowan et al., 2016; Sternberg, 2018). Foreman and Gubbins (2015) suggested that non-examination methods for identifying gifted students need to be implemented because not all gifted students demonstrate their abilities through traditional testing methods.

The identification of gifted children is often initiated by adults who interact with children. School districts often ask teachers to nominate students or provide input during the gifted identification process. (Foreman & Gubbins, 2015; McGowan et al., 2016; Renzulli, 2005). A study by Foreman and Gubbins (2015) revealed that teachers are able to successfully identify students who demonstrate gifted characteristics who are not easily measured by traditional assessments. Parents are also called upon to provide input with regard to their child's strengths and needs, and can be used to supplement teacher recommendations (Horne & Shaughnessy, 2013; Rothenbusch et al., 2018).

In the absence of discovering a common identification method during the literature review, I posit that it is beneficial to provide a description of Renzulli's (2005) proposal for identifying gifted students, since Renzulli's work was referenced by several recent studies on giftedness that appeared in the literature review (Almarode et al., 2014; Andersen & Cross, 2014; Foreman & Gubbins, 2015; Heilbronner, 2013; Horne &

Shaughnessy, 2013; Morris, 2013; Ozdemir, 2018; Rothenbusch et al., 2018; Smith & Campbell, 2016; Sternberg, 2018; Swanson & Lord, 2013; Tay et al., 2018; Tofel-Grehl & Callahan, 2017; Trna & Trnova, 2015; Wilson, 2018). Renzulli's plan for identifying gifted and talented students consists of six steps. Renzulli proposed a plan for creating a talent pool consisting of approximately 15% of the school's general population. Once the target talent pool size has been identified by calculating 15% of the general population of the school, the first step consists of filling approximately 50% of the talent pool based on test score criteria. Renzulli suggested that identified students should earn test scores falling in the 92nd to 99th percentiles. This identification prevents educators from discriminating against students who traditionally receive high academic scores, but may be missed when judged against other qualifying criteria (Renzulli, 2005). The remaining 50% of the talent pool should be filled by following Steps 2-6. In the second step, Renzulli proposed that teachers nominate students using a research-based teacher nomination scale. Renzulli commented that these ratings are similar to test score ratings, and mentioned that some teachers tend to under-nominate or over-nominate students. Most of the students who make up the talent pool are typically identified in Steps 1 and 2. In the third step, a school-created selection committee considers other criteria such as parent nominations, peer nominations, or self-nominations (Renzulli, 2005). In the fourth step, Renzulli proposed that teachers who taught students in previous years should nominate students who were not included in the first three steps. Renzulli believed that the fourth step is a safeguard against nominator bias in Step 2 and student potential that is often not recognized due to short-term personal, family, or motivation issues that

emerged during the nomination year. In the fifth step, school personnel should notify the child's parents about their child's talent pool nomination and provide them with information about the educational services that will be offered. In the sixth and final step, special services can be designed for students who demonstrate "a remarkable display of creativity, task commitment, or a previously unrecognized need for highly challenging opportunities" (Renzulli, 2005, p. 273).

Current methods of identifying students for participation in gifted services result in the underrepresentation of certain populations of students. A number of studies revealed that students from low income backgrounds are underrepresented in gifted education (Hamilton et al., 2018; Horne & Shaughnessy, 2013; Little, Adelson, Kearney, Cash, & O'Brien, 2018; Shaunessy-Dedrick & Cotabish, 2014; Smith & Campbell, 2016). Hamilton et al. (2018) suggested that a number of factors contribute to the underrepresentation of low income students in gifted identification procedures, including teacher and parent referrals, fewer learning opportunities, and historically lower scores on traditional achievement and cognitive ability measures. Minority children are also underrepresented by current means of identifying gifted students, which appear to be limited by sociocultural bias (Horne & Shaughnessy, 2013; Shaunessy-Dedrick & Cotabish, 2014; Smith & Campbell, 2016; Young & Young, 2018). Another problem with the identification of gifted students in the United States is that the process usually only begins after the second grade, once students begin taking standardized achievement tests (Kaplan & Hertzog, 2016).

Experts have estimated that 3-10% of the population is gifted (McGowan et al., 2016; Trna & Trnova, 2015). With the appropriate support, gifted students have the potential to improve their academic success up to 20-25% (Freeman, as cited in Trna & Trnova, 2015). As a result, states are under increased pressure to identify gifted students early in the students' schooling (Kaplan & Hertzog, 2016; Swanson & Lord, 2013).

Legislation Related to Educating Gifted Learners

In 2002, the United States Department of Education formally defined gifted and talented students as "those who give evidence of high achievement capability in areas such as intellectual, creative, artistic or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop their capabilities" (Flint, 2014, p. 66). United States policy makers recognize the importance of improving the educational opportunities for gifted learners. Swanson and Lord (2013) commented, "Quality programs grow out of strong policy" (p. 217). In 2004, the United States Congress included gifted and talented children in their funding priorities under the Individuals with Disabilities Education Act (IDEA; Pereira et al., 2015). In the summer of 2014, the United States Department of Education called for proposals for projects that could lead to an increase in the participation of traditionally underrepresented student populations in gifted programs (Shaunessy-Dedrick & Cotabish, 2014). Other recent mandates such as the Common Core State Standards, the set of Learning and Innovation Skills identified by the Partnership for 21st Century Skills, and Teacher Preparation Standards in Gifted Education support emphasizing creativity in gifted education practices (Flint, 2014; National Association for Gifted Children, 2013).

In spite of recent attempts to define giftedness and increase funding for gifted support, there is no federal mandate in place in the United States that requires schools to identify or provide special services to gifted students (National Association for Gifted Children, 2013; Pereira et al., 2015). As a result, some states have mandates with respect to identifying gifted children while others do not (Kaplan & Hertzog, 2016; Pereira et al., 2015; Swanson & Lord, 2013). The literature review also revealed a need for legislation supporting students who are twice-exceptional, meaning those who are identified as being gifted and learning disabled (Pereira et al., 2015).

Needs of Gifted Learners

Perhaps due in part by the absence of a singular definition of giftedness, gifted learners represent a diverse cross-section of the population (Bakar et al., 2013; Kerr & McKay, 2013; Yurt & Kurnaz, 2015). As a result, they cannot be stereotyped into one generalized description. Gifted students do not make up a homogeneous group and have a wide variety of academic and social needs (Horne & Shaughnessy, 2013; Ishak et al., 2013; Morris, 2013; Tay et al., 2018).

The literature review, however, revealed a number of academic and social characteristics that appear to be prevalent among gifted students. With regard to academia, gifted learners thrive in open-ended learning environments that nurture and challenge their creativity (Angelova, 2014; Horne & Shaughnessy, 2013; Kaplan & Hertzog, 2016; Mullet et al., 2018). Gifted learners tend to self-regulate more efficiently and possess higher levels of motivation than other students (Luftenegger, Kollmayer, Bergsmann, Spiel, & Schober, 2015; Morris, 2013), and as a result, learn faster than other

students and can benefit from individualized pacing, breadth, and learning objectives (Morris, 2013; Tortop, 2014).

With regard to social characteristics, researchers have suggested that gifted students have strong perceptions of self-efficacy (Morris, 2013; Nilgun & Ayca, 2016). Gifted students also display a great degree of empathy, which is said to be highly correlated with strong leadership (Bakar et al., 2013; Morris, 2013). Gifted students also possess personality traits that could have a negative effect on their educational and psychological development, such as perfectionism and competitiveness (Bakar et al., 2013).

Gifted students also report feeling unchallenged at school. In four separate investigations, gifted students reported feeling bored in school and expressed that teachers in their schools do not adequately challenge them nor value them as learners, especially at the secondary level and in inclusive regular education classrooms (Bayok et al., 2013; Morris, 2013; Mullet et al., 2018; Ozdemir, 2018). In addition, gifted students can be limited by a small number of academically appropriate course offerings available, especially in mathematics (Mullet et al., 2018). When gifted students are appropriately supported in school, they can excel in certain areas by an additional 20-25% (Trna & Trnova, 2015). In addition, when gifted students with an interest in STEM-related areas are appropriately supported, there is an improved chance that they will persist through college and earn an undergraduate STEM degree (Almarode et al., 2014). Parental support is critical to the success of gifted students (Horne & Shaughnessy, 2013; Morris, 2013). Lastly, mathematically gifted students need mathematics teachers who possess a

strong formal education in mathematics, especially at the secondary level (Karsenty, 2014). Even though gifted students have a diverse set of characteristics, an understanding of some of their similar traits may help educators improve their abilities to meet their academic and social needs.

Experiences of Gifted Students

The literature review revealed a limited number of studies where gifted students were allowed opportunities to reflect on their own needs. Gifted students reported feeling bored in school and commented that teachers in their schools do not adequately challenge them nor value them as learners, especially at the secondary level and in inclusive regular education classrooms (Bayok et al., 2013; Morris, 2013; Mullet et al., 2018; Ozdemir, 2018). Specifically, gifted students lamented that teachers often assign tasks that the students feel are repetitive and unnecessary (Bayok et al., 2013; Morris, 2013). Although the majority of research suggests that gifted learners thrive in open-ended and loosely structured learning environments, Tofel-Grehl and Callahan (2017) offered an opposing stance, revealing that students enrolled in a STEM high school reported a desire for increased levels of direct instruction. In a study related to the mathematics self-efficacy of gifted students, Yurt and Kurnaz (2015) revealed that the personal learning experiences of gifted students had a significant impact on the gifted students' perceived levels of mathematics anxiety. Gifted students' own opinions and experiences combined with secondhand research about giftedness should both be considered in the development of gifted policy and strategies.

Programs and Interventions for Gifted Learners

The research revealed a number of educational programs that are currently in place to support gifted learners. Some schools are attempting to meet the needs of their gifted learners by incorporating gifted-friendly approaches within their classes, such as RTI, mentoring, differentiation, acceleration, and enrichment (Horne & Shaughnessy, 2013). Some schools provide appropriately challenging and rigorous programs to their gifted students in the form of STEM and STEAM curriculum (Coxon, Dohrman, & Nadler, 2018; Dailey, Cotabish et al., 2018; Payton, White, & Mullins, 2017; Wilson, 2018). Additionally, out of school weekend and summer STEM programs are often successful in meeting the needs of mathematically promising students (Bayok et al., 2013; Dailey, Cotabish et al., 2018; Ihrig et al., 2018; Little et al., 2018; Mun & Hertzog, 2018; Tay et al., 2018; Young & Young, 2018). Lastly, specialized high schools and honors colleges are successfully meeting the needs of mathematically talented students (Almarode et al., 2014; Mullet et al., 2018; Tofel-Grehl & Callahan, 2017; Tofel-Grehl, Feldon, & Callahan, 2018).

A number of needs for gifted students still exist, in spite of the existence of programs to support gifted learners. One of these needs is an increased opportunity for younger students to engage in gifted supports (Little et al., 2018), especially with regard to STEM programming (Tay et al., 2018). Additionally, there is a need for collaboration among teachers, counselors, and administrators to provide appropriate social guidance and supports (Horne & Shaughnessy, 2013; Ishak et al., 2013). Lastly, some current educational practices hinder the success of gifted students and should be reconsidered,

namely: (a) teaching with one singular scope and sequence for all students in a course, (b) relying on a singular curriculum or instructional approach, (c) relying on rote and drill instructional methods when working with diverse students, and (d) identifying gifted students through the use of measuring instruments (Horne & Shaughnessy, 2013; Kaplan & Hertzog, 2016). Although a number of educational programs are currently in place to support the needs of gifted learners, there remains a need for additional accommodations as well as a need for modifications of existing supports.

Inclusive Classrooms

Inclusive classrooms are environments where students with disabilities and students without disabilities learn together (Fruth & Woods, 2015; Individuals with Disabilities Education Act, 2004). Some definitions of inclusion specify that students spend a certain amount of time, such as 80% or more, in general education classrooms (Kurth & Forber-Pratt, 2017; Sheehey et al., 2017). The practice of educating students in inclusive classrooms is expanding globally (Kurth & Forber-Pratt, 2017; Lee, Yeung, Tracey, & Barker, 2015; Rubenstein et al., 2015). The idea behind inclusive education is that all students are exposed to, and participate in, meaningful learning opportunities (Alderton & Gifford, 2018; Mulcahy et al., 2016). Inclusive learning institutions may require fewer material resources as compared to separate specialized learning institutions, resulting in economic benefits (Micanovic, Novovic, & Maslovaric, 2017).

Teachers in inclusive classrooms are expected to meet an increasingly diverse and challenging set of student needs (Alderton & Gifford, 2018; Everett, 2017; Faragher et al., 2017; Kurth & Forber-Pratt, 2017; Rubenstein et al., 2015; Sheehey et al., 2017; Van

Ingen et al., 2016). Teachers may receive only "modest support for including children with special needs in inclusive classrooms" (Lee et al., 2015, p. 85). Therefore, a need exists to better understand and support the needs of teachers who educate children in inclusive classrooms.

While Choi, Meisenheimer, McCart, and Sailor (2017) revealed educational stakeholders' concern about students with disabilities in inclusive classrooms reducing the overall quality of instruction provided to the students without, other researchers' findings suggested that inclusive education provided benefits to students with and without learning disabilities (Bottge, Cohen, & Choi, 2018; Choi et al., 2017; Clapham, Manning, Williams, O'Brien, & Sutherland, 2017; Fruth & Woods, 2015; Kurth & Forber-Pratt, 2017; Lee et al., 2015). In fact, many researchers suggested that students with learning disabilities performed significantly better in inclusive classrooms as compared to segregated environments (Bottge et al., 2018; Clapham et al., 2017; Kurth & Forber-Pratt, 2017; Lee et al., 2015). It should be noted, however, that students without learning disabilities have been shown to perform significantly higher in homogeneous environments versus inclusive classrooms when it comes to learning mathematics (Fruth & Woods, 2015; Gunarhadi, Anwar, Andayani, & Shaari, 2016).

Ozdemir (2018) suggested that gifted students in the United States currently spend the majority of their time learning with students in inclusive, or heterogeneous, classrooms, prompting many researchers to express concern that gifted students' needs are often overlooked in inclusive classrooms (Bayok et al., 2013; Morris, 2013; Ozdemir, 2018; Trna & Trnova, 2015). Gifted students, as well as students with and without

learning disabilities, “should be afforded the accommodations necessary to fully participate in the learning activities in school, thereby helping to ensure success in their lives outside school” (Bottge et al., 2018, p. 198).

The literature review revealed a greater number of interventions currently in place to meet the needs of struggling learners in inclusive classrooms as compared to those that meet the needs of gifted students in inclusive classrooms (Alderton & Gifford, 2018; Bottge et al., 2018; Choi et al., 2017; Ellingsen & Clinton, 2017; Faragher & Clarke, 2016; Faragher et al., 2017; Ibrahim, Ghazwa, & Leeder, 2017; Jitendra et al., 2018; Micanovic et al., 2017; Monei & Pedro, 2017; Schmidt, 2016; Sheehey et al., 2017; Soorenian, 2018; Van Ingen et al., 2016; Weiland, 2016). Additionally, educational approaches that meet the creative needs of gifted students were demonstrated by Flint (2014) to benefit all types of learners. Fruth and Woods (2015) suggested that more research is needed to determine the impact of inclusive educational practices on students without learning disabilities.

Effective Teachers

Teachers are the most important school-related factor that contributes to student success (Council for Exceptional Children, 2013; Ekstam et al., 2017; Shaunessy-Dedrick & Cotabish, 2014). In order to develop effective training opportunities for teachers, it is important to understand the traits that effective teachers possess (Lopez-Agudo & Marcenaro-Gutierrez, 2017). While intelligence levels contribute to student achievement in mathematics, teacher motivation and learning strategies are shown to have the greatest impact on long-term student growth (Murayama, Pekrun, Lichtenfeld, & Vom Hofe,

2013). Students respond best to teachers who are enthusiastic and who appear to be knowledgeable in their subject matter (Bages et al., 2016; Lazarides et al., 2018; Sarac & Aslan-Tutak, 2017). Kim et al. (2017) also suggested that student academic confidence is linked to teacher personality. Students respond better to teachers who attribute their success in mathematics to hard work, rather than the possession of a natural talent, leading to an increase in student self-efficacy in mathematics (Bages et al., 2016). In addition to possessing a deep understanding of the subject matter they teach, effective teachers must also possess an understanding of the most effective strategies, or pedagogy, for delivering their content to their students (Blank, 2013). Lazarides et al. (2018) suggested that "teachers who are enthusiastic and who report high self-efficacy often have highly motivated students" (p. 1). Effective teachers appear to be those who are able to create and maintain engaging learning environments for their students (Lopez-Agudo & Marcenaro-Gutierrez, 2017).

Teachers must be able to create and maintain suitable learning environments (Lopez-Agudo & Marcenaro-Gutierrez, 2017); this skill is especially critical for teachers who educate students gifted in STEM disciplines (Trna & Trnova, 2015). A number of teaching strategies have proven to be especially effective for mathematically gifted students. One effective strategy is to provide students with regular opportunities to engage in real-life, open-ended, problem solving exercises, or problem-based learning (Alterator et al., 2018; Brisson et al., 2017; Flint, 2014; Mathews, 2017; Merritt et al., 2017; Mun & Hertzog, 2018). Problem-based learning opportunities have been shown to increase student academic achievement in a number of ways, including improved

knowledge retention, greater conceptual understanding, and improved attitudes about learning (Merritt et al., 2017). A number of other strategies are employed by effective teachers, including differentiation (Dijkstra, Walraven, Mooij, & Kirschner, 2017; Sad, Kis, & Demir, 2017), incorporating math-related literature in the classroom (McAndrew, Morris, & Fennell, 2017), using instructional games (Mun & Hertzog, 2018; Turgut & Temur, 2017); engaging students in cooperative learning activities (Master, Cheryan, & Meltzoff, 2017; Mun & Hertzog, 2018; Sad et al., 2017), promoting a mastery-oriented classroom (Lazarides et al., 2018), and providing students with opportunities to practice metacognition (Mathews, 2017). Lastly, effective teachers of gifted students tend to take advantage of opportunities to collaborate with other teachers (Sad et al., 2017). Although researchers have revealed some qualities of teachers who effectively meet the needs of mathematically gifted students, Karsenty (2014) recommended that additional research is still needed in this area.

Teacher evaluation policies are placing a high priority on improving teacher quality and have shifted from focusing on content mastery and degrees obtained to attempting to measure teacher effectiveness based on the achievement of their students (Blank, 2013; Council for Exceptional Children, 2013; Goldhaber, Liddle, & Theobald, 2013). Research surrounding IMPACT, one teacher evaluation system that is used in the District of Columbia public schools, revealed that student achievement can increase when low performing teachers are identified and replaced with more effective teachers (Adnot, Dee, Katz, & Wyckoff, 2017). There is a current need for teacher evaluation reform in the United States (Council for Exceptional Children, 2013). A better understanding of

current strengths and needs of gifted education practices can contribute to more effective and fair teacher evaluation policies.

Teacher Training and Professional Development

The value of teacher preparation programs is debated in recent research (Goldhaber et al., 2013). Some findings suggest that teacher training does not have a marked effect on teacher attitudes or behaviors (Lee et al., 2015; Rubenstein, 2013; Shahbari, 2018); however, the majority of researchers suggest that teacher preparation programs have a positive impact on teacher performance (Griffin et al., 2018; Handal et al., 2015; Katz & Stupel, 2016; Leavy & Hourigan, 2018; Levi-Keren & Patkin, 2016; Shuilleabhain & Seery, 2018; Tortop, 2014). Teacher preparation programs often provide insufficient training to meet the needs of gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). This inadequate preparation is especially true in inclusive classrooms where teachers are responsible for delivering instruction to students with a wide range of academic abilities and social needs (Alderton & Gifford, 2018; Everett, 2017; Faragher et al., 2017; Kurth & Forber-Pratt, 2017; Sheehey et al., 2017; Van Ingen et al., 2016). In addition, teachers may not know how to provide appropriately challenging educational experiences for gifted students (Flint, 2014; Morris, 2013). A study by Rubenstein et al. (2015) on teachers' reactions to pre-differentiated and enriched mathematics curricula demonstrated that teachers are willing to differentiate to meet the needs of the students in their classes when they are provided with the appropriate training and resources. Goldhaber et al. (2013) argued that poor

quality control within the teacher training system is partly to blame for inadequate teacher preparation (Goldhaber et al., 2013).

Teachers of mathematically gifted students, especially at the secondary level, should possess a strong knowledge of mathematics (Blank, 2013; Karsenty, 2014; Mishal & Patkin, 2016; Riordain, Paolucci, & O'Dwyer, 2017). Teachers of mathematically gifted students also require advanced training in the teaching of mathematics (Carney et al., 2016) and other STEM disciplines (Ong et al., 2016). Carney et al. (2016) suggested that across the United States, the mathematics instruction is lacking qualified educators, appropriate depth of understanding, and rigor. Research shows that when teachers receive appropriate training that includes mastery experiences and develops teachers' physiological and emotional states, their teaching self-efficacy is improved, which leads to gains in students' achievements and on school climate (Chang, 2015). Effective teacher training has been shown not only to improve teachers' content knowledge, but also to increase educators' teaching efficacy (Griffin et al., 2018; Katz & Stupel, 2016; Leavy & Hourigan, 2018; Levi-Keren & Patkin, 2016; Tortop, 2014). The impact of teacher efficacy beliefs will be presented in the next section.

States such as Colorado, Louisiana, Tennessee, and Texas evaluate the quality of teacher preparation programs based on the student performance of the programs' trainees (Goldhaber et al., 2013). A number of professional development practices appear to be beneficial with regard to preparing teachers. Teachers can become more effective when they are given opportunities to share ideas with other colleagues, including mentor teachers (Blank, 2013; Dailey, Jackson, Cotabish, & Trumble, 2018; Kurth & Forber-

Pratt, 2017; Lloyd, 2018; Ong et al., 2016; Rubenstein, 2013). In fact, Dumay, Boonen, and Van Damme (2013) suggested that teacher collaboration and the resulting collective efficacy have a greater impact on mathematics teacher growth than the impact of principal leadership qualities. Shuilleabhain and Seery (2018) reported that teachers may benefit from professional learning experiences that include lesson study. Teachers also appear to benefit from opportunities to become interested in the content they are teaching (Dierks, Hoffler, & Parchmann, 2014; Ekstam et al., 2017). Teacher education programs should also foster reflective practices in teachers, in addition to developing pedagogical skills (Looney et al., 2017). In order to help gifted education professionals meet the needs of gifted and talented students, the National Association for Gifted Children (2013) has developed Teacher Preparation Standards in Gifted and Talented Education for the following areas: (a) learner development and individual learning differences, (b) learning environments, (c) curricular content knowledge, (d) assessment, (e) instructional planning and strategies, (f) professional learning and ethical practice, and (g) collaboration (Appendix H). It is important to develop quality teacher preparation programs because educators tend to mimic their own learning experiences in their classrooms (DeFraine et al., 2014). An understanding of teacher efficacy with regard to teaching gifted students in inclusive classrooms can be used to improve formal and informal teacher training opportunities.

Teachers' Experiences, Attitudes, and Beliefs and Their Impact on Instruction

Teachers' beliefs about teaching and about mathematics can play a role in determining their teaching effectiveness (Bandura, 1993; Chang, 2015; Looney et al.,

2017; Xenofontos, 2018). Ekstam et al. (2017) suggested that "teacher efficacy has one of the largest effects on student performance" (p. 338), and that teacher efficacy can be predicted by teachers' interest and level of subject knowledge. Sarac and Aslan-Tutak (2017) revealed that mathematics teacher efficacy levels can vary among specific courses and topics. Supporting research on self-efficacy of early childhood teachers shows that self-efficacy is highest for literacy, lower for science, and lowest for mathematics (Gerde et al., 2018). Teacher mathematics knowledge and teacher efficacy for teaching mathematics are positively correlated (Shayshon, Gal, Tesler, & Ko, 2014).

Teacher efficacy has been found to influence teachers' thoughts and feelings, the amount of effort teachers put into teaching, the selection of instructional activities used by teachers, and the level of persistence teachers exhibit when they are confronted with obstacles (Chang, 2015). High levels of teacher self-efficacy contribute to efficient classrooms, quality instruction, student motivation, improved student achievement, and positive school climate (Carney et al., 2016; Gerde et al., 2018; Horne & Shaughnessy, 2013; Katz & Stupel, 2016; Karakus, Akman, & Ergene, 2018; Lazarides et al., 2018; Miller et al., 2017). Teacher self-efficacy affects the teacher's instructional approaches, as well as student academic gains (Carney et al., 2016; Katz & Stupel, 2016). Katz and Stupel (2016) reported that teachers with high levels of teaching self-efficacy were more likely than teachers with low levels of teaching self-efficacy to expend effort in planning, instructing, organizing, goal setting, and in exhibiting flexibility. Teachers with greater teaching self-efficacy were also more likely than teachers with less self-efficacy to take instructional risks in the classroom (Katz & Stupel, 2016).

Rubenstein (2013) reported that teachers who perceive themselves to be gifted tend to have positive attitudes about the gifted students they teach; however, these positive feelings do not necessarily translate into actions that attempt to meet the needs of the gifted students in their classroom. However, when teachers receive appropriate training for working with gifted students, they can experience an increase in teaching self-efficacy, which in turn has a positive influence on their students' achievements and on school climate (Chang, 2015). Smith and Campbell (2016) suggested that teachers' opinions about giftedness shape their perception of their students' abilities and determine how teachers group students for different learning tasks.

Teacher participation in STEM experiences may have an effect on teacher attitudes and behaviors (Dailey, Jackson et al., 2018; Ihrig et al., 2018; Tofel-Grehl & Callahan, 2017). Teachers who participate in specialized STEM training opportunities experience improved attitudes with regard to engineering, increased creativity, improved critical reflection, as well as increased levels of efficacy (Dailey, Jackson et al., 2018; Ihrig et al., 2018). In a study by Tofel-Grehl and Callahan (2017) that explored high school teachers' beliefs regarding STEM student giftedness, teachers expressed feelings that teachers and students are intellectually and socially similar at those schools, gifted students learn best independently, and that gifted students thrive in challenging, inquiry-based learning environments with heavy workloads.

Teachers want to incorporate more creativity and STEM instruction into their curriculum, but feel they do not have enough time, training, or knowledge required to do so (Dailey, Cotabish et al., 2018; Flint, 2014). Flint (2014) also suggested that teachers'

classroom practices are influenced by a felt pressure to teach directly to state tests, and out of fear of being reprimanded by administrators if their classrooms are loud or require students to get out of their seats.

Teachers also expressed opinions regarding mathematics class size. In one study regarding mathematics class size, teachers reported that with regard to gifted and talented classes, larger classes promoted greater levels of student achievement (Handal et al., 2015). Teachers also noted that in classes with low-achieving mathematics students, smaller class sizes resulted in fewer classroom management issues (Handal et al., 2015).

State assessment performance also has an impact on teacher attitudes (King-Sears & Baker, 2014). Special education and mathematics teachers in schools who met AYP goals were found to have more positive attitudes as compared to teachers in schools who did not meet AYP goals (King-Sears & Baker, 2014). Teacher anxiety that results from failing to meet the needs of their students can lead to decreased job performance and overall career dissatisfaction (King-Sears & Baker, 2014).

Teacher attitudes and opinions about the practice of inclusion also emerged from the research. Smith and Campbell (2016) found that teachers' attitudes toward inclusion are influenced by a number of factors, including teacher training, the types of special needs that are present in the classroom, teacher knowledge of special needs, teacher experience in educating children with special needs, and the professional role of the teacher. Additionally, three themes emerged from a study by Kurth and Forber-Pratt (2017) on teachers' views of inclusive education. First, teachers reported feeling doubtful about the ability of schools to adequately meet the diverse needs of students with

disabilities in inclusive classrooms (Kurth & Forber-Pratt, 2017). Second, teachers reported being generally supportive of the idea of inclusion, but many felt that they lacked the training, resources, and time to properly implement effective inclusive strategies. Third, teachers expressed a concern about the possible impact of the practice of inclusion on students without disabilities, because of classroom disruptions and a slower pace of instruction. Kurth and Forber-Pratt noted that contrary to teacher concerns, researchers strongly suggest that inclusion has a positive, or at worst neutral, impact on students without disabilities, which may be linked to quality implementation of inclusion, accessible curriculum, and the availability of other schoolwide services and supports.

When teachers receive appropriate training for working with gifted students, they can experience an increase in teaching self-efficacy which, in turn, has a positive influence on their students' achievements and on school climate (Chang, 2015). With teacher efficacy playing a large role in determining student success, it is important to improve teacher training for providing supports for gifted students. As the research described here has demonstrated, if teachers are better prepared to meet the needs of their students, including gifted students, student motivation and performance can increase, teacher effectiveness and job satisfaction can increase, and the entire school climate can be improved.

Gaps Related to the Current Study

The authors of recent studies revealed a number of gaps related to the teaching and learning of students in inclusive mathematics classrooms. Chang (2015) suggested

that there is a need for research exploring the relationship between teacher self-efficacy and students' self-efficacy, specifically in the domain of learning mathematics and at the middle school level, as that is a crucial self-efficacy developmental period for adolescents. Additionally, there appears to be a gap in research seeking to determine whether heterogeneous or homogeneous grouping is most effective for gifted students with regard to mathematics instruction (Fruth & Woods, 2015). A study by Tay et al. (2018) revealed a gap in research focusing on the unique needs of gifted pre-kindergarten and kindergarten students, especially in the area of STEM education. Lastly, research by Andersen and Cross (2014) revealed a need to better understand the motivation of gifted students, in order to better develop their talents.

Even though prior researchers have explored the beliefs of gifted students with regard to instruction in inclusive classrooms (Bayok et al., 2013; Morris, 2013; Mullet et al., 2018; Ozdemir, 2018), a gap in current research exists concerning teacher beliefs about providing instruction for gifted students in inclusive classrooms, particularly in relation to mathematics (Celik et al., 2018). Additionally, the majority of scholarly articles obtained during this literature review were either quantitative studies or syntheses of literature or programs, revealing a gap in qualitative studies related to gifted education (Morris, 2013). Very few researchers sought to gain the opinions and perceptions of the teachers themselves (Handal et al., 2015; Ihrig et al., 2018; Kurth & Forber-Pratt, 2017; Li, Liu et al., 2018; Miller et al., 2017; Tofel-Grehl & Callahan, 2017). The literature revealed a gap that exists specifically related to teaching gifted students that result in recommendations for the teachers of those students, which this study sought to address.

Summary and Conclusions

Chapter 2 included a review of the literature relevant to this study. This chapter began with a description of the literature search strategy. The conceptual framework was presented and Bandura's (1977) social cognitive theory was explained. Next, the literature review addressed the research as it relates to the definition of giftedness, the identification of gifted students, legislation related to educating gifted learners, the needs of gifted learners, experiences of gifted learners, programs and interventions for gifted learners, inclusive classrooms, effective teachers, teacher training and professional development, teachers' experiences, attitudes, and beliefs and their impact on instruction, and gaps related to this study.

The purpose of this study was to address the gaps that exist with respect to exploring the experiences of teachers who work with mathematically gifted students, and the need for more studies that result in recommendations for the teachers of gifted students. Chapter 3 includes a discussion of the research design and the rationale behind that design, as well as an explanation of the role of the researcher. The methodology is presented, and includes a description of the participant selection logic and instrumentation used. Next, the procedures for recruitment, participation, and data collection are described, followed by an explanation of the data analysis plan. Lastly, issues of trustworthiness and ethical procedures are presented, followed by a chapter summary.

Chapter 3: Research Method

The purpose of this qualitative, phenomenological study was to explore the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms. My goal for this study, grounded in Bandura's (1977, 1986) social cognitive theory, was to offer recommendations for improving teacher job satisfaction in relation to providing appropriate learning experiences for gifted students in inclusive settings. To accomplish that purpose, I described the factors that teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms. I also described the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students.

This chapter begins with a discussion of the research design and the rationale behind that design, as well as an explanation of the role of the researcher. I present the methodology and include a description of the participant selection logic and instrumentation. Next, I expound on the procedures for recruitment, participation, and data collection, and follow with an explanation of the data analysis plan. Lastly, I present issues of trustworthiness and ethical procedures followed by a chapter summary.

Research Design and Rationale

The nature of the research questions determined the design of the study. The research questions for this study were based on Bandura's (1977, 1986, 1997) social cognitive framework and the literature review for this study.

1. What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?

2. What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?
3. What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?

Phenomenological Research

The nature of this study lent itself to a qualitative, transcendental phenomenological research design for a number of reasons. Phenomenological research is defined as qualitative research focused on discovering the common lived experiences of individuals in relation to a central concept or phenomenon (Merriam, 2009; Moustakas, 1994; Patton, 2015). Phenomenology is best suited for seeking to understand the common lived experiences of individuals (Merriam, 2009; Patton, 2015). The common lived experience of interest in this study was teaching gifted students in an inclusive mathematics classroom.

Phenomenological research can fit one of two designs: hermeneutical phenomenology or transcendental phenomenology (Vagle, 2014). In hermeneutical phenomenology, the researcher is a vital component of the research, injecting his or her views into the interactions with the participants (Vagle, 2014). In transcendental phenomenology, developed by Edmund Husserl, the researcher's personal opinions are bracketed in an effort to understand the true essence of the lived experiences of the participants with regard to the phenomenon being studied (Moustakas, 1994; Patton, 2015; Van Manen, 2014). In this study, I used a transcendental phenomenological design,

as I wanted my own preconceived ideas about the research topic to be excluded from the data.

The study followed the general structure of phenomenological studies as recommended by Moustakas (1994). I began the study by providing an introduction to the problem and stating the research questions. Then, I described the research procedures that I followed. After the interview data were collected and transcribed, I analyzed the data for significant statements using the methods of Van Kaam as prescribed by Miles, Huberman, and Saldana (2014) and Moustakas. I developed themes of meanings across the significant statements. Moustakas recommended that the goal of data analysis is to provide an exhaustive description of the phenomenon; therefore, I extrapolated the findings to highlight the richness of the data collected.

Alternative Methodologies

I considered other possible research designs but determined each were unsuitable for this study. Alternative qualitative research designs considered included ethnographic research, grounded theory research, and narrative research (see Merriam, 2009; Patton, 2015). I also considered utilizing a quantitative research design as described by Osborne (2008) but determined the quantitative method inappropriate for the stated purpose of this study, which was to explore the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms. In the following paragraphs I describe each alternative research method and provide an explanation of why each method was not well suited for this study.

Ethnographic research is a form of qualitative research that focuses on an entire cultural group (Merriam, 2009; Patton, 2015). This phenomenological study had the potential to include participants from several cultural groups. Therefore, I determined that an ethnographic design would be inappropriate for this study. Grounded theory research is a type of qualitative research that requires the researcher to generate a theory that emerges during the research process (Merriam, 2009; Patton, 2015). My goal was to understand the lived experiences of teachers instructing gifted students in inclusive mathematics classrooms, not to generate a theory. Therefore, I disregarded grounded theory as an appropriate research design. Narrative research is a form of qualitative research that focuses on exploring the life of an individual (Patton, 2015). Narrative analysis is also used to understand data in the form of stories that have a beginning, middle, and end (Merriam, 2009). My aim was to explore the essence of the lived experiences of a group of public school teachers rather than to understand the life of a singular person. I determined that narrative research was an inappropriate method when considering the nature of this study. Basic qualitative research is a research design used to understand how individuals interpret their lives and the meaning they give to their lived experiences (Merriam, 2009). In this study, I wanted to understand the phenomenon of teaching gifted students in inclusive classrooms. When a researcher's goal is to understand the essence of a shared phenomenon, a phenomenological design is better suited than a basic qualitative research design. Therefore, I determined that a basic qualitative descriptive design was inappropriate for the research design for this study.

Quantitative research is used when the researcher's objective is to quantify a problem by generating and analyzing numerical data, and is a means for examining the relationship among variables (Osborne, 2008). In quantitative research, the researcher uses measurable data as a means to uncover patterns related to a problem and to generalize results from the study sample to a larger population (Osborne, 2008). I developed the research questions in this study to fit a qualitative design rather than a quantitative design. Qualitative research is better suited than quantitative research when the researcher's objective is to gain a rich understanding of people's thoughts and opinions (Merriam, 2009; Moustakas, 1994; Osborne, 2008; Patton, 2015).

Role of the Researcher

My stated goal for this research was to understand and explain lived experiences of others (Merriam, 2009; Moustakas, 1994; Patton, 2015). I served in the role of sole researcher in this study and interviewed all of the participants as I sought to understand their lived experiences with regard to teaching gifted students in inclusive mathematics classrooms. To minimize any potential bias in the study and to fully inform the reader, I provide a summary of my personal and professional background that may be relevant to this study.

I reside in a suburban neighborhood with my three daughters and my husband. It is possible that participants in this study may have been familiar with me or other members of my family. My daughters attend local schools in our neighborhood school district, and there was a chance that I might ask their past teachers to participate in the study. My husband teaches science at a local middle school at a second local school

district, and other teachers from the district where he is employed may have been asked to participate in the study. I worked as a high school mathematics teacher in a third nearby school district for 12 years. Currently, I own a local photography business. As a result, I may have known some of the participants personally either through my photography business or as coworkers at my former school district. Neither my husband nor I have ever served in a position of authority over teachers who were asked to participate in the study, and I did not anticipate experiencing any issues over a conflict of interest or power differential. To avoid potential conflict of interest, I excluded teachers from this study who were currently employed at the same school building as my husband, as well as teachers who currently or formerly had my daughters as students.

Participants in phenomenological studies should be carefully selected by the researcher and should have all experienced the phenomenon being studied (Merriam, 2009; Moustakas, 1994; Patton, 2015). My educational and professional backgrounds provided me with the experience necessary to select appropriate participants for the study. When I was an elementary school student, I was evaluated for giftedness and was enrolled in my school district's gifted program. Two of my three daughters were also evaluated for giftedness and enrolled in their school district's gifted program. I acquired experience in the field of gifted education as a gifted individual, as a parent of gifted individuals, and as a former teacher of gifted students. My high school and college studies were focused in the areas of mathematics and science. As an undergraduate student, I earned a bachelor's of science in mechanical engineering. After deciding I wanted to become a mathematics teacher, I returned to college and earned a master's of

education with an emphasis in cross-cultural education. At the completion of this dissertation, I will have earned a doctor of philosophy in education degree with an emphasis in curriculum, instruction, and assessment. I worked as a middle school mathematics teacher in an urban school district in Southern California for 5 years before relocating to Pennsylvania and teaching mathematics at a rural high school for 12 years. I also worked as an adjunct mathematics professor at a suburban college campus for 10 years. In recent years, I have been employed as a mathematics educational consultant and provide job-embedded professional development to mathematics teachers in New York and New Jersey. My experiences with gifted education, mathematics education, and teacher education provided me with the necessary perspective to develop meaningful research questions related to this study and to recruit appropriate participants for the study. My experiences as a gifted learner, mother of gifted children, and teacher of gifted students also had the potential to introduce bias into the study. I minimized bias through the action of bracketing my own ideas and thoughts before collecting, analyzing, and reporting study participant data.

Methodology

Participant Selection Logic

Neither Moustakas (1994) nor Patton (2015) provided a suggested sample size for phenomenological studies. Creswell (2013) recommended a sample size of five to 25 individuals for phenomenological studies. In phenomenological studies, smaller sample sizes are recommended so that the researcher can strategically select participants who will allow for a rich understanding of the lived experience being studied; the number of

participants is not necessarily important (Moustakas, 1994). In this study, participants included 12 teachers who provide mathematics instruction in inclusive classrooms that include identified gifted students. This number of participants was large enough to provide adequate data for saturation to occur, yet small enough to handle as a single researcher. Saturation occurs when data becomes redundant, meaning no new information is being provided by additional participants (Merriam, 2009). Researchers determine when saturation has occurred by "analyzing patterns as fieldwork proceeds and continuing to add to the sample until nothing new is being learned" (Patton, 2015, p. 271). These inclusive classrooms were located in five public school districts located in eastern Pennsylvania. In order to achieve maximum variation in my sample, I aimed to recruit a target of three elementary school mathematics teachers, a target of three middle school mathematics teachers, and a target of three high school mathematics teachers as participants. Creating a target value instead of an exact number of participants at each grade level allowed me to have some flexibility with regard to the actual number of teachers who chose to participate in my study as well as the number of participants required at each grade level until data saturation was reached. Data saturation was reached after I interviewed five elementary school mathematics teachers, two middle school mathematics teachers, and five high school mathematics teachers.

In phenomenological studies, participants are often referred to as research partners (Moustakas, 1994). In order to identify potential research partners, I emailed superintendents of public school districts located in eastern Pennsylvania explaining the purpose of this study and seeking approval to collect data (see Appendix A). Upon

receiving permission from a school district's superintendent (see Appendix B), and after IRB approval (Approval No. 11-01-18-0175506), I used the school district's website to identify potential participants. In order to avoid potential conflict of interest, I excluded teachers from this study who were currently employed at the same school building as my husband, as well as teachers who currently formerly had my daughters as students. I purposefully determined potential participants based on the following inclusion criteria, so that I could be sure they had experienced the phenomenon being studied: (a) all participants must be employed as mathematics teachers at this research site; (b) all participants must provide instruction in mathematics in inclusive classrooms, which are defined as classrooms where all students learn together, including regular education students, gifted students, and students with disabilities; and (c) all participants must provide instruction to some students in these classrooms who are identified as gifted. I emailed the school principals asking them to help me determine those teachers who meet the inclusion criteria.

From this list of potential participants, I emailed the teachers in the school district who met the inclusion criteria informing them of my study and inviting them to participate if they were interested (see Appendix C). In order to achieve a diverse sample population with regard to grade level taught, I selected the first two to five teachers at each level (elementary, middle, and high school) who expressed an interest in participating in this study by returning a signed consent form. The initial recruitment resulted in enough participants for data saturation to occur, so additional recruitment was not necessary.

Instrumentation

Long interviews are the typical method of data collection in phenomenological studies (Moustakas, 1994, p. 114). I used initial interviews, follow-up interviews, and memoing as the data sources for this study. I designed the initial and follow-up interview questions that I used to collect data from participants during individual interviews (see Appendix D). I designed the interview questions to inform the research questions, which were grounded in Bandura's (1977, 1986) social cognitive theory. Specifically, I developed the interview questions to elicit participant responses that would reveal experiences, training, and other factors that contribute to teacher self-efficacy with respect to teaching gifted students in inclusive mathematics classrooms. I established content validity by creating a table that showed how each interview question was related to a research question (see Appendix D). I vetted my interview protocol and questions by emailing a draft of the interview protocol and questions to five education experts and asked them to provide feedback. The draft copy of the interview protocol and questions is provided in Appendix D along with the feedback received from the education experts. I modified my interview protocol and interview questions based on the feedback that I received from the education experts. The final interview protocol and questions are provided in Appendix E.

Procedures for Recruitment, Participation, and Data Collection

Participant recruitment and data collection took place during the 2018-2019 school year. Participants included 12 teachers who provide mathematics instruction in inclusive classrooms that include identified gifted students. I stopped recruiting

participants once data saturation was achieved in accordance with Merriam's (2009) recommendations. According to Merriam, saturation occurs when data becomes redundant, meaning no new information is being provided by additional participants. These inclusive classrooms were located in five public school districts located in Eastern Pennsylvania. Qualitative researchers should strive for a variety of participant experiences when determining the sample (Merriam, 2009; Moustakas, 1994). In order to achieve maximum variation in my sample, I aimed to recruit a target of three elementary school mathematics teachers, a target of three middle school mathematics teachers, and a target of three high school mathematics teachers as participants. Creating a target value instead of an exact number of participants at each grade level allowed me to have some flexibility with regard to the actual number of teachers who chose to participate in my study as well as the number of participants required at each grade level until data saturation was reached. I reached data saturation after interviewing five elementary school mathematics teachers, two middle school mathematics teachers, and five high school mathematics teachers. In order to identify potential research partners, I emailed superintendents of public school districts located in eastern Pennsylvania explaining the purpose of this study and seeking approval to collect data (see Appendix A). Upon receiving written permission from a school district's superintendent (see Appendix B), and after Walden University IRB approval (Approval No. 11-01-18-0175506), I used the school district's website to identify potential participants. In order to avoid potential conflict of interest, I excluded teachers from this study who were currently employed at the same school building as my husband, as well as teachers who currently or formerly

had my daughters as students. I purposefully determined potential participants based on the following inclusion criteria, so that I could be sure that they had experienced the phenomenon being studied: (a) all participants must be employed as mathematics teachers at this research site, (b) all participants must provide instruction in mathematics in inclusive classrooms, which are defined as classrooms where all students learn together, including regular education students, gifted students, and students with disabilities and (c) all participants must provide instruction to some students in these classrooms who are identified as gifted in mathematics. In addition to locating potential participants via school websites, I also emailed the school principals at the addresses listed on school websites asking them to help me determine those teachers who met the inclusion criteria. From this list of potential participants, I emailed the teachers at the school district who met the inclusion criteria informing them of my study and inviting them to participate if they were interested (see Appendix C). In order to achieve a diverse sample population with regard to grade level taught, I selected the first two to five teachers at each level (elementary, middle, and high school) who expressed an interest in participating in this study by returning a signed consent form to me.

I did not collect any data until I received full approval from the Walden University IRB (Approval No. 11-01-18-0175506). I conducted all interviews. I designed the initial and follow-up interview questions used to collect data from participants during individual interviews (see Appendix E). I conducted all interviews in-person, via web-based service, or via telephone, and audio-recorded each interview so for transcription purposes. My preference was to conduct in-person interviews because of the importance

of establishing personal connections and trust with study participants (Moustakas, 1994). I conducted in-person interviews at the participant's school site, in the participant's classroom, during non-instructional hours. I utilized a web-based service and telephone for any interviews I could not conduct in-person. I conducted follow-up interviews 1–8 weeks after the initial interviews took place. In addition to the initial and follow-up interviews, I asked participants to review the tentative findings of the study for credibility. Initial interviews lasted between 45–75 minutes, and follow-up interviews lasted between 20–35 minutes. The final member review of the tentative findings occurred via email communication, in order to ensure consistency with the participants' intent. The member checking process is described in greater detail below. The initial recruitment resulted in enough participants for data saturation to occur, so additional recruitment was not necessary. Participants could exit the study at any time, as per the informed consent.

Data Analysis Plan

I hired a transcriptionist to transcribe the audio recordings of my interviews. The transcriptionist was asked to sign a confidentiality agreement in order to maintain participant confidentiality (see Appendix G). I analyzed the transcribed interview data using a modification of the Van Kaam method of analysis for phenomenological data recommended by Moustakas (1994). I analyzed data in relation to the central and related research questions and interpreted in relation to the conceptual framework and the literature review (see chart in Appendix E). I analyzed and interpreted data in relation to Bandura's (1977, 1986) social cognitive theory. I designed the interview questions to

elicit participant responses that would reveal experiences, training, and other factors that contribute to teacher self-efficacy with respect to teaching gifted students in inclusive mathematics classrooms.

Moustakas (1994) described the steps in the modification of the Van Kaam method of analysis for phenomenological data. After I received the completely transcribed participant interviews from the transcriptionist, I employed horizontalization as the first step of analysis. Horizontalization is the process of highlighting, listing, and grouping all interview statements that are relevant to the phenomenon being studied (Moustakas, 1994). The second step of the Van Kaam method of data analysis is reduction and elimination, where irrelevant, repetitive, or unclear expressions are rejected (Moustakas, 1994). The horizons that remain are called the invariant constituents of the phenomenon (Moustakas, 1994). The third step in the Van Kaam data analysis process is clustering and thematizing the invariant constituents. The fourth step in analyzing the data is validation, or the final identification of the invariant constituents and themes by application (Moustakas, 1994). In this phase, the researcher matches the invariant constituents and their accompanying themes against the interview transcripts and checks for compatibility. The fifth step of the Van Kaam data analysis procedure is to create an individual textural description for each interview, including verbatim examples from the transcribed data (Moustakas, 1994). During the sixth step in the data analysis process, I created an individual structural description of the phenomenon being studied, as suggested by Moustakas. The seventh step in the data analysis process is to construct a textural-structural description of the meanings and essences of the phenomenon for each

research participant (Moustakas, 1994). The final step in the Van Kaam data analysis process is to develop a composite description of the meanings and essences of the phenomenon that represents the participant group as a whole (Moustakas, 1994). Throughout this data analysis process, I used NVivo12 qualitative research software to code my data and organize my coding into themes. I verified discrepant cases with participants through member checking. I revised any discrepant cases deemed incorrectly coded and included correctly coded discrepancies in the results of the analysis.

Issues of Trustworthiness

All research must be performed in an ethical manner while generating valid and reliable results (Merriam, 2009; Miles et al., 2014). Due to the personal nature of qualitative research, the standards for rigor in qualitative studies differ from those of quantitative studies (Merriam, 2009). Trustworthiness in qualitative studies is ensured in a number of ways, including, but not limited to, conducting research in an ethical manner (Merriam, 2009; Miles et al., 2014). Criteria that researchers should use to establish trustworthiness include credibility (internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity; Merriam, 2009; Miles et al., 2014). I discuss these four criteria and additional strategies for ensuring trustworthiness in a qualitative study in greater detail below.

Credibility (Internal Validity)

One way of establishing trustworthiness in a qualitative study is by maintaining credibility (Merriam, 2009; Miles et al., 2014). According to Merriam (2009), credibility "deals with the question of how research findings match reality" (p. 213). In this study, I

ensured credibility during member checking when the participants checked my interpretation of their thoughts and ideas that were communicated during the interview process, including initial and follow-up interviews (Merriam, 2009).

Transferability (External Validity)

Another way of maintaining trustworthiness in a qualitative study is through the process of creating transferability (Merriam, 2009; Miles et al., 2014). Transferability is "concerned with the extent to which the findings of one study can be applied to other situations" (Merriam, 2009, p. 223). One way to maximize transferability is through the use of rich, thick description when reporting on the setting, participants, and the findings of the study (Merriam, 2009). I enhanced transferability of the findings by careful selection of the study sample. Merriam (2009) and Moustakas (1994) suggested that researchers strive to achieve maximum variation among their sample in order to enhance transferability of the study. The data from this study is transferable to other schools and teachers because the participants represented a variety of grade levels, genders, and teaching experience. Transferability is potentially limited to other schools with similar socioeconomic status, gender, and ethnicity profiles.

Dependability (Reliability)

In quantitative studies, reliability "refers to the extent to which research findings can be replicated" (Merriam, 2009, p. 220). Replication is not necessarily the objective of qualitative studies, where researchers often seek to describe and understand events as they are experienced. As a result, qualitative researchers instead strive for dependability. Dependability refers to the extent to which "the results are consistent with the data

collected" (Merriam, 2009, p. 221). I used a common interview protocol and data analysis method to ensure dependability in this study (see Appendix E). I vetted the interview protocol and questions with education experts (see Appendix D), enhancing the dependability of this study (Miles et al., 2014).

Confirmability (Objectivity)

Confirmability refers to the neutrality of a study (Miles et al., 2014). Confirmability, or objectivity, is achieved when the researcher's inherent bias is removed from the data, or is at least acknowledged when it cannot be removed (Miles et al., 2014). I achieved credibility by following an established interview protocol (see Appendix E) and through researcher memoing before and after the interview process. Member checking at the conclusion of the initial and follow-up interviews also added to the confirmability of this study (Merriam, 2009; Miles et al., 2014).

Data Triangulation

Data triangulation is another way to ensure that a study is trustworthy (Merriam, 2009). Data triangulation is a strategy used to determine if findings are consistent across all participants and variables. Triangulation can be accomplished by collecting data from different types of instruments or via different sources (Merriam, 2009, p. 229). In this study, interviews constituted the only data instrument, so triangulation occurred through different sources. The first source of triangulation included the initial interviews. The second source of triangulation included follow-up interviews with all participants. A third source of triangulation included researcher and participant memoing. Member checking

provided an additional source of data consistency, which consisted of follow-up emails with the participants to confirm that the completed data analysis was accurate.

Memoing

Memoing is an additional way to add trustworthiness to a research study, and is a method that supports triangulation of data (Miles et al., 2014). I utilized researcher memoing, also referred to as journaling, in this study to document what I thought, heard, saw, and experienced throughout the research process. After each interview I journaled my thoughts about the interview. As the interviews progressed, memoing helped me better understand the data clusters that emerged from the interviews and enabled me to eliminate my own bias that was present during the data collection and analysis processes.

In addition to completing researcher memoing, I also asked my participants to engage in memoing themselves. At the end of the initial interview, I gave the participants a printed copy of my interview questions. During the time that passed between our initial and follow-up interviews, I asked participants to record any additional experiences or thoughts they had related to the interview questions I asked. If participants chose to participate in memoing, I collected their notes in-person or via email when I conducted the follow-up interviews, and used their memoing data to ensure that my interpretation of their responses was correct. I also supplemented their interview responses with the memoing data, as necessary.

Member Checking

Member checking is another way of ensuring the trustworthiness of a study, and is a strategy for data triangulation (Merriam, 2009). Member checks, also referred to as

audit checks, allow the researcher to take into account recommendations made by the study participants and ensure the accuracy of the collected data (Merriam, 2009; Miles et al., 2014). Member checking by participants also helps ensure participant confidentiality and anonymity, as research partners may be able to spot identifying information that the researcher may not have considered (Miles et al., 2014). During the member checking process, the researcher asks the participants to review their statements and the accompanying interpretations for accuracy (Merriam, 2009; Miles et al., 2014). I gave each participant a complete transcript of the interview via email and provided each participant the opportunity to check the transcript for accuracy and completeness. The member checking process ensures that any emerging theories are in accordance with the participants' beliefs and thoughts (Merriam, 2009; Miles et al., 2014).

Saturation of Data

Another way to ensure the trustworthiness of a qualitative study is through saturation of data (Merriam, 2009; Patton, 2015). Data saturation is achieved when enough data is collected so that no new information would likely be obtained through additional sampling (Merriam, 2009; Patton, 2015). According to Patton (2015), researchers determine when saturation has occurred by "analyzing patterns as fieldwork proceeds and continuing to add to the sample until nothing new is being learned" (p. 271). According to Merriam (2009), saturation occurs when data becomes redundant. In this study, I interviewed 12 participants. The initial recruitment resulted in enough participants for data saturation to occur, so additional recruitment was not necessary.

Bracketing

Bracketing is an additional way to establish trustworthiness in a qualitative study. During bracketing, the researcher removes personal experiences and personal bias in an attempt to interpret data from a neutral mindset (Moustakas, 1994; Patton, 2015). Bracketing is an essential step in conducting a transcendental phenomenological research study, as it is this process that allows the researcher to convey the overall essence of the themes that emerged from the study with respect to the participants' shared experience (Moustakas, 1994; Patton, 2015). The process of memoing enabled me to eliminate my own bias that was present during the data collection and analysis processes and provided a means for bracketing.

Transcriptions

Transcriptions from the participant interviews can also be used to establish trustworthiness (Miles et al., 2014). Upon receiving the transcribed interviews from the transcriptionist, I saved and reviewed the data for accuracy. In order to ensure confidentiality, I asked the transcriptionist to sign a confidentiality agreement (see Appendix G). I shared the transcription from each participant's interview with the participant via email in order for the participant to check the data for accuracy and completeness, and to ensure that I had achieved confidentiality (Miles et al., 2014). I also used the transcriptions to give the participants opportunities to further elaborate on their responses if necessary.

Ethical Procedures

I took care to ensure the ethical treatment of all participants in this study. Through the use of the informed consent, I fully informed participants about the study. Each individual participated in the study by their own free will as evidenced by their signatures on the informed consent. I contacted the superintendents of local school districts via email and asked if they were willing to have their teachers participate in this study (see Appendix A). I recruited teachers after gaining IRB approval (Approval No. 11-01-18-0175506) via an invitation to participate (see Appendix C). I provided each participant with a consent form, and asked the participant to sign it prior to participating in any interviews. There was no known risk of danger to any participant at any time. Participants could exit the study at any time, as per the informed consent.

I kept teacher and school names confidential by using pseudonyms in the reporting of data. I asked the transcriptionist to sign a confidentiality agreement before being provided with the recorded audio interview data (see Appendix G). Using pseudonyms removed the chance of damaging the reputation of any participating school or teacher. During the member checking process, participants ensured that I had achieved confidentiality (Miles et al., 2014). I maintained a file linking the actual names to the pseudonyms, and stored the file on a password-protected electronic drive or kept it in a locked closet in my home office.

I kept all data from the study confidential and stored data on a password-protected electronic drive or kept it in a locked closet in my home office. I gave participants the opportunity to read their interview transcripts either in-person or via email and gave

participants the chance to withdraw any comments made. I will not use the data for any future research and will destroyed all after five years of completion of the doctoral program at Walden University, per university guidelines.

Summary

In this chapter, I discussed the research method being used in this study. I included a summary of the research design and rationale, and stated the research questions. I described the role of the researcher, and provided a discussion of the strengths and an awareness of biases that I may have brought to the study. This chapter included a discussion of the methodology, including participant selection logic, instrumentation, and procedures for recruitment, participation, and data collection. I presented the data analysis plan. In this chapter I addressed issues of trustworthiness, including credibility, transferability, dependability, confirmability, data triangulation, memoing, member checking, saturation of data, bracketing, and transcriptions. I concluded the chapter with a discussion of ethical procedures followed throughout the study.

Chapter 4 includes a discussion of the results of this study. The chapter includes a description of the setting and demographics, followed by the data collection and data analysis procedures. I describe steps taken to ensure trustworthiness. The results are discussed in detail. Chapter 4 concludes with a summary and conclusions.

Chapter 4: Results

The purpose of this qualitative, phenomenological study was to explore the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms. My goal in this study, grounded in Bandura's (1977, 1986) social cognitive theory, was to offer recommendations for improving teacher job satisfaction in relation to providing appropriate learning experiences for gifted students in inclusive settings. To accomplish that purpose, I described the factors that teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms. I also described the perceptions of teachers regarding how their professional development influences the academic achievement of these students. The research questions for this study were based on Bandura's (1977, 1986, 1997) social cognitive framework and the literature review for this study.

1. What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?
2. What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?
3. What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?

Chapter 4 begins with a discussion of the setting for this study and a description of the participant demographics. Next, I describe the data collection and data analysis

methods, and follow with a discussion of issues of trustworthiness. Lastly, I present the results, followed by a chapter summary.

Setting

The setting for this study included eight schools from five public school districts located in Eastern Pennsylvania. The schools serve students in rural and suburban middle-class communities. Participants included 12 teachers currently employed at three elementary schools, two middle schools, and three high schools. The school sites included one high school from Fallbrook District (pseudonym), one middle school from Golden Oak District (pseudonym), one middle school and one high school from Harmony District (pseudonym), one elementary school and one middle school from Lakeside District (pseudonym), and one elementary school and one high school from Twin Pines District (pseudonym). Fallbrook District has an enrollment of approximately 4,500 students, Golden Oak District has an enrollment of approximately 2,500 students, Harmony District has an enrollment of approximately 4,100 students, Lakeside District has an enrollment of approximately 1,300 students, and Twin Pines District has an enrollment of approximately 2,000 students. There does not appear to have been any personal or organizational conditions that influenced participants or their experience at the time of the study that may influence the interpretation of the study results.

Demographics

Participant recruitment and data collection took place during the 2018–2019 school year. Participants included 12 teachers who provide mathematics instruction in inclusive classrooms that include identified gifted students. The inclusive classrooms are

located in eight different schools from five public school districts located in Eastern Pennsylvania. In order to achieve maximum variation in my sample as recommended by Merriam (2009) and Moustakas (1994), I aimed to recruit a target of three elementary school mathematics teachers, three middle school mathematics teachers, and three high school mathematics teachers as participants. Creating a target value instead of an exact number of participants at each grade level allowed me to have some flexibility with regard to the actual number of teachers who chose to participate in my study as well as the number of participants required at each grade level until data saturation was reached. I reached data saturation after I interviewed five elementary school mathematics teachers, two middle school mathematics teachers, and five high school mathematics teachers. I purposefully determined potential participants based on the following inclusion criteria so that I could be sure participants had experienced the phenomenon being studied: (a) all participants must be employed as mathematics teachers at this research site; (b) all participants must provide instruction in mathematics in inclusive classrooms; which are defined as classrooms where all students learn together, including regular education students, gifted students, and students with disabilities; and (c) all participants must provide instruction to some students in these classrooms who are identified as gifted. In order to achieve a diverse sample population with regard to grade level taught, I selected the first two to five teachers at each level (elementary, middle, and high school) who expressed an interest in participating in this study by returning a signed consent form to me. Participants included five male teachers and seven female teachers. Participant demographics are described in Table 1.

Table 1

Participant Demographics

Pseudonym	Math Class(es) Taught	Years Teaching	District
Angela	Fifth Grade Math	20	Lakeside
Brandon	Geometry, Advanced Statistics, AP Statistics	20	Harmony
Chad	Fifth Grade Math	9	Harmony
Cheryl	Sixth Grade Math	20	Golden Oak
Kevin	Honors Algebra 2	8	Harmony
Natasha	Eighth Grade Math	12	Lakeside
Olivia	Fourth Grade Math	27	Lakeside
Sharon	Third Grade Math	9	Lakeside
Steven	Fourth Grade Math	5	Twin Pines
Wanda	Algebra 1, Honors Probability & Statistics, AP Statistics	18	Fallbrook
Wendy	Pre-Calculus, Honors Pre-Calculus	27	Harmony
William	Geometry, Honors Geometry	5	Twin Pines

The 12 teachers who participated in the study were employed at eight schools from five different public school districts. One high school teacher from Fallbrook District participated in the study. One middle school teacher from Golden Oak District participated in the study. One middle school teacher and three high school teachers from Harmony District participated in the study. Three elementary school teachers and one middle school teacher from Lakeside District participated in the study. One elementary school teacher and one high school teacher from Twin Pines District participated in the study. Five male teachers (two elementary school teachers and three high school teachers) and seven female teachers (three elementary school teachers, two middle school teachers, and two high school teachers) participated in the study.

Data Collection

Participants included 12 teachers who provide mathematics instruction in inclusive classrooms that include identified gifted students. Participants included five male teachers and seven female teachers. I stopped recruiting participants once data saturation was achieved. These inclusive classrooms were located in eight different schools from five public school districts located in Eastern Pennsylvania. I did not collect any data until I received full approval from the Walden University IRB (Approval No. 11-01-18-0175506). I conducted all interviews. I designed the initial and follow-up interview questions used to collect data from participants during individual interviews (see Appendix E). I conducted all interviews in-person, via web-based service, or via telephone, and audio-recorded each interview so for transcription purposes. My preference was to conduct in-person interviews because of the importance of establishing personal connections and trust with study participants (Moustakas, 1994). I conducted in-person interviews at the participant's school site, in the participant's classroom, during non-instructional hours. I utilized a web-based service and telephone for any interviews I could not conduct in-person. I conducted follow-up interviews 1–8 weeks after the initial interviews took place, based on each participant's availability. I recorded in-person interviews on Sony digital voice recorders (model ICDUX560BLK), and web and telephone-based interviews using Zoom conferencing software. I hired a transcriptionist to transcribe the audio recordings of my interviews. I asked the transcriptionist to sign a confidentiality agreement in order to maintain participant confidentiality (see Appendix G). I asked participants to review the tentative findings of the study for credibility. Initial

interviews lasted between 45–75 minutes, and follow-up interviews lasted between 20–35 minutes. I conducted the final member review of the tentative findings via email communication in order to ensure consistency with the participants' intent. I describe the member checking process in greater detail below. The initial recruitment resulted in enough participants for data saturation to occur, so additional recruitment was not necessary. Participants could exit the study at any time, as per the participant consent form. No participants exited the study before its completion.

Data Analysis

After the interviews were completed and transcripts verified for accuracy, I analyzed the transcribed interview data using a modification of the Van Kaam method of analysis for phenomenological data recommended by Moustakas (1994). Data were analyzed in relation to the central and related research questions and interpreted in relation to the conceptual framework and the literature review (see chart in Appendix E). Data were analyzed and interpreted in relation to Bandura's (1977, 1986) social cognitive theory. I designed the interview questions to elicit participant responses that would reveal experiences, training, and other factors that contribute to teacher self-efficacy with respect to teaching gifted students in inclusive mathematics classrooms.

I uploaded the transcripts from the initial and follow-up interviews into NVivo12 software. Then, I followed the data analysis steps that Moustakas (1994) described. The first step of the Van Kaam method of data analysis is horizontalization. Horizontalization is the process of highlighting, listing, and grouping all interview statements that are relevant to the phenomenon being studied (Moustakas, 1994). The second step of the Van

Kaam method of data analysis is reduction and elimination where irrelevant, repetitive, or unclear expressions are rejected (Moustakas, 1994). The horizons that remain are called the invariant constituents of the phenomenon (Moustakas, 1994). I completed the first and second steps using NVivo12 by reading each transcript line-by-line and highlighting responses that were relevant to the interview questions. I then reread each transcript to ensure that no important statements were missed. The third step in the Van Kaam data analysis process is clustering and thematizing the invariant constituents. As I read through the interview statements, I entered themes into NVivo12 that emerged from the data and highlighted the interview responses that pertained to each theme. The fourth step in analyzing the data is validation, or the final identification of the invariant constituents and themes by application (Moustakas, 1994). In this phase, the invariant constituents and their accompanying themes are matched against the interview transcripts and checked for compatibility. During this step, I reread each of the participant responses and confirmed they were accurately coded under each theme. The fifth step of the Van Kaam data analysis procedure is to create an individual textural description for each interview, including verbatim examples from the transcribed data (Moustakas, 1994). During the sixth step in the data analysis process, I created an individual structural description of the phenomenon being studied, as suggested by Moustakas. The seventh step in the data analysis process is to construct a textural-structural description of the meanings and essences of the phenomenon for each research participant (Moustakas, 1994). The final step in the Van Kaam data analysis process is to develop a composite description of the meanings and essences of the phenomenon that represents the participant group as a

whole (Moustakas, 1994). I completed the final four steps by looking at printed out NVivo12 summaries, selecting quotes, and analyzing themes for this report. I verified discrepant cases with participants through member checking. I revised incorrectly coded discrepant cases and reported correctly coded discrepancies in the results.

For each research question, themes emerged when at least 50% of the participants shared an experience directly related to that theme. I created sub-themes under each theme when at least 25% of the participants described an experience or opinion relevant to that subtheme. The themes that emerged for each research question are listed in Table 2. The subthemes are listed in subsequent tables and described in the discussion of each theme.

Table 2.

Themes within Research Questions

Research Question	Themes
1. What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?	Challenging experience Motivating or rewarding experience Characteristics of gifted students Building-level gifted support provided to students
2. What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?	Obstacles encountered while teaching Rewards gained from teaching Ways teachers can make a difference in students' lives Formal training received that could be applied to teaching gifted students Informal training received that could be applied to teaching gifted students Teacher needs Teacher self-evaluation
3. What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?	Impact of training on instructional practices Impact of training on student academic achievement

Evidence of Trustworthiness

Trustworthiness in qualitative studies is ensured in a number of ways including, but not limited to, conducting research in an ethical manner (Merriam, 2009; Miles et al., 2014). Criteria that researchers should use to establish trustworthiness include credibility (internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity; Merriam, 2009; Miles et al., 2014). The four criteria and

additional strategies used to ensure trustworthiness in this qualitative study are discussed in greater detail below.

Credibility (Internal Validity)

One way of establishing trustworthiness in a qualitative study is by maintaining credibility (Merriam, 2009; Miles et al., 2014). According to Merriam (2009), credibility "deals with the question of how research findings match reality" (p. 213). In this study, I ensured credibility during member checking when the participants checked my interpretation of their thoughts and ideas that were communicated during the interview process, including initial and follow-up interviews (Merriam, 2009). Member checking took place over email so that participants could review their data at their own convenience. The member checking process is described in greater detail below.

Transferability (External Validity)

Another way of maintaining trustworthiness in a qualitative study is through the process of creating transferability (Merriam, 2009; Miles et al., 2014). Transferability is "concerned with the extent to which the findings of one study can be applied to other situations" (Merriam, 2009, p. 223). One way to maximize transferability is through the use of rich, thick description when reporting on the setting, participants, and the findings of the study (Merriam, 2009). I enhanced transferability by careful selection of the study sample. Merriam (2009) suggested that researchers strive to achieve maximum variation among their sample in order to enhance transferability of the study. The data from this study is transferable to other schools and teachers because the participants represented a variety of grade levels, genders, and teaching experience. Participants in this study

included 12 teachers who provide mathematics instruction in inclusive classrooms that include identified gifted students. These inclusive classrooms were located in eight different schools from five public school districts located in Eastern Pennsylvania. Grades taught ranged from third to twelfth. Participants included five male teachers and seven female teachers. Teacher experience ranged from five to 27 years. Transferability is potentially limited to other schools with similar socioeconomic status, gender, and ethnicity profiles.

Dependability (Reliability)

In quantitative studies, reliability "refers to the extent to which research findings can be replicated" (Merriam, 2009, p. 220). Repeatability is not necessarily the objective of qualitative studies where researchers often seek to describe and understand events as they are experienced. As a result, qualitative researchers instead strive for dependability. Dependability refers to the extent to which "the results are consistent with the data collected" (Merriam, 2009, p. 221). Using a common interview protocol and data analysis method ensured dependability in this study (see Appendix E). I vetted the interview protocol and questions with education experts (see Appendix D), enhancing the dependability of this study (Miles et al., 2014). I gave all participants an opportunity to review their data via email.

Confirmability (Objectivity)

Confirmability refers to the neutrality of a study (Miles et al., 2014). Confirmability, or objectivity, is achieved when the researcher's inherent bias is removed from the data, or is at least acknowledged when it cannot be removed (Miles et al., 2014).

I achieved confirmability by following an established interview protocol (see Appendix E) and through researcher memoing before and after the interview process. Member checking at the conclusion of the initial and follow-up interviews also added to the confirmability of this study (Merriam, 2009; Miles et al., 2014).

Data Triangulation

Data triangulation is another way to ensure that a study is trustworthy (Merriam, 2009). Data triangulation is a strategy used to determine if findings are consistent across all participants and variables. Triangulation can be accomplished by collecting data from different types of instruments or via different sources (Merriam, 2009, p. 229). In this study, interviews were the only data instrument, so triangulation occurred through different sources. The first source of triangulation included the initial interviews. The second source of triangulation included follow-up interviews with all participants. A third source of triangulation included researcher and participant memoing. Member checking provided an additional source of data consistency, which consisted of follow-up emails with the participants to confirm that the completed data analysis was accurate.

Memoing

Memoing is an additional way to add trustworthiness to a research study, and is a method that supports triangulation of data (Miles et al., 2014). I utilized researcher memoing, also referred to as journaling, in this study to document what I thought, heard, saw, and experienced throughout the research process. After each interview I journaled my thoughts about the interview. As the interviews progressed, memoing helped me

better understand the data clusters that emerged from the interviews and enabled me to eliminate my own bias that was present during the data collection and analysis processes.

In addition to completing researcher memoing, I also asked my participants to engage in memoing themselves. At the end of the initial interview, I gave participants a printed copy of my interview questions. During the time that passed between our initial and follow-up interviews, I asked participants to record any additional experiences or thoughts they had related to the interview questions I asked. If participants chose to participate in memoing, I collected their notes in person or via email when I conducted the follow-up interviews, and used their memoing data to ensure that my interpretation of their responses was correct. I also supplemented participants' interview responses with the memoing data as necessary.

Member Checking

Member checking is another way of ensuring the trustworthiness of a study and is a strategy for data triangulation (Merriam, 2009). Member checks, also referred to as audit checks, allow the researcher to take into account recommendations made by the study participants and ensure the accuracy of the collected data (Merriam, 2009; Miles et al., 2014). Member checking by participants also helps ensure participant confidentiality and anonymity, as research partners may be able to spot identifying information that the researcher may not have considered (Miles et al., 2014). During the member checking process, the researcher asks the participants to review their statements and the accompanying interpretations for accuracy (Merriam, 2009; Miles et al., 2014). The member checking process ensures that any emerging theories are in accordance with the

participants' beliefs and thoughts (Merriam, 2009; Miles et al., 2014). I gave the participants complete transcripts of their interviews via email and provided participants with the opportunity to check the transcripts for accuracy and completeness.

Saturation of Data

Another way to ensure the trustworthiness of a qualitative study is through saturation of data (Merriam, 2009; Patton, 2015). Data saturation is achieved when enough data is collected so that no new information would likely be obtained through additional sampling (Merriam, 2009; Patton, 2015). According to Patton (2015), researchers determine when saturation has occurred by "analyzing patterns as fieldwork proceeds and continuing to add to the sample until nothing new is being learned" (p. 271). According to Merriam (2009), saturation occurs when data become redundant. In this study, I interviewed 12 participants. The initial recruitment resulted in enough participants for data saturation to occur, so additional recruitment was not necessary.

Bracketing

Bracketing is an additional way to establish trustworthiness in a qualitative study. During bracketing, the researcher removes personal experiences and personal bias in an attempt to interpret data from a neutral mindset (Moustakas, 1994; Patton, 2015). Bracketing is an essential step in conducting a transcendental phenomenological research study, as it is this process that allows the researcher to convey the overall essence of the themes that emerged from the study with respect to the participants' shared experience (Moustakas, 1994; Patton, 2015). Before conducting the interviews and throughout the

data collection process, I journaled my own thoughts and experiences related to the research questions in order to be aware of any inherent personal bias.

Transcriptions

Transcriptions from the participant interviews can also be used to establish trustworthiness (Miles et al., 2014). Upon receiving the transcribed interviews from the transcriptionist, I saved and reviewed the data for accuracy. In order to ensure confidentiality, I asked the transcriptionist to sign a confidentiality agreement (see Appendix G). I shared the transcription from each participant's interview with the participant via email in order for the participant to check the data for accuracy and completeness, and to ensure that I had achieved confidentiality (Miles et al., 2014). I also used the transcriptions to give the participants opportunities to further elaborate on their responses if necessary.

Ethical Procedures

I took care to ensure the ethical treatment of all participants in this study. Through the use of the informed consent, I fully informed participants about the study. Each individual participated in the study by their own free will as evidenced by their signatures on the informed consent. I contacted the superintendents of local school districts via email and asked if they were willing to have their teachers participate in this study (see Appendix A). I recruited teachers after gaining IRB approval (Approval No. 11-01-18-0175506) via an invitation to participate (see Appendix C). I provided each participant with a consent form, and asked the participant to sign it prior to participating in any

interviews. There was no known risk of danger to any participant at any time. Participants could exit the study at any time, as per the informed consent.

I kept teacher and school names confidential by using pseudonyms in the reporting of data. I asked the transcriptionist to sign a confidentiality agreement before being provided with the recorded audio interview data (see Appendix G). Using pseudonyms removed the chance of damaging the reputation of any participating school or teacher. During the member checking process, participants ensured that I had achieved confidentiality (Miles et al., 2014). I maintained a file linking the actual names to the pseudonyms, and stored the file on a password-protected electronic drive or kept it in a locked closet in my home office.

I kept all data from the study confidential and stored data on a password-protected electronic drive or kept it in a locked closet in my home office. I gave participants the opportunity to read their interview transcripts either in-person or via email and gave participants the chance to withdraw any comments made. I will not use the data for any future research and will destroyed all after five years of completion of the doctoral program at Walden University, per university guidelines.

Results

I will begin by describing each of the participants. Next, I will describe the themes and subthemes that emerged through the interviews with the participants. Unique information about the participants and very specific stories participants shared that could be used to identify them are excluded from this report.

Introduction to the Participants

The 12 participants are briefly introduced before the findings are discussed in order to provide the reader with a better understanding of the participants' responses and selected quotes. I provide only general overviews in order to maintain participant confidentiality. Specific stories shared that could lead to participant identification are not reported here; however, I considered those stories while analyzing the interview data in order to fully inform this study. I used pseudonyms in place of all participant, school, and school district names in order to maintain confidentiality.

Angela. Angela is a teacher at Lakeside Elementary School. She has been teaching for 20 years and is currently teaching fifth grade mathematics and science. She previously taught all subjects in the fourth and fifth grades. Angela currently provides instruction to two gifted students in her inclusive mathematics class. She is not sure if either of those students are gifted specifically in the area of mathematics. Her mathematics classes are 90 minutes in length. She has paraprofessional and intervention specialists who provide in-class support to individual students. Angela has never been identified as being gifted herself. Angela's formal teacher training occurred in Pennsylvania. The initial interview and follow-up interviews with Angela both took place via Zoom conference software.

Brandon. Brandon is a teacher at Harmony High School. He has been teaching for 20 years and is currently teaching ninth grade geometry, advanced statistics, and AP statistics. He has also taught algebra and pre-calculus. He currently provides instruction to seven gifted students in his inclusive mathematics classes. He does not believe that any

of those students are gifted specifically in mathematics. His mathematics classes are 45 minutes long. Brandon is not sure if he has ever been identified as being gifted. Brandon's formal teacher training occurred in Pennsylvania. The initial and follow-up interviews with Brandon both took place in his classroom.

Chad. Chad is a teacher at Harmony Middle School. He has been teaching for nine years and is currently teaching fifth grade mathematics. He also has experience teaching every grade from kindergarten through sixth grade. He currently provides instruction for four gifted students in his inclusive mathematics classes, and all four of those students are gifted specifically in mathematics. His mathematics classes are 80 minutes long. The mathematics class that contains the gifted students is co-taught with another teacher, but that teacher primarily provides support for the lower-achieving students. Chad was never tested for giftedness himself. Chad's formal teacher training occurred in Pennsylvania. The initial and follow-up interviews with Chad both took place via Zoom conference software.

Cheryl. Cheryl is a teacher at Golden Oak Middle School. She has been teaching for 20 years and is currently teaching sixth grade mathematics. She has prior experience at the elementary, middle, and high school levels as a teacher and mathematics coach. She currently provides instruction to three gifted students in her inclusive mathematics classes, and all three of those students are gifted specifically in mathematics. One of her students is twice-exceptional, being both gifted and autistic. Her mathematics classes are 50 minutes long. One of her classes that contains gifted students is co-taught with another teacher who primarily provides assistance to a learning support student. Cheryl has been

identified as being gifted. Cheryl's formal teacher training occurred in Pennsylvania. The initial and follow-up interviews with Cheryl both took place via Zoom conference software.

Kevin. Kevin is a teacher at Harmony High School. He has been teaching for eight years and is currently teaching honors algebra 2 and AP computer science. He has prior experience teaching seventh grade pre-algebra, eighth grade algebra, high school algebra, geometry, algebra 2, pre-calculus, AP calculus, and special education mathematics. He currently provides instruction to 14 gifted students in his inclusive mathematics classes, and 10 of those students are gifted specifically in mathematics. His mathematics classes are 45 minutes long. He is the only teacher in his classes that contain gifted students. Kevin has never been identified as being gifted. Kevin's formal teacher training occurred in Pennsylvania. The initial and follow-up interviews with Kevin both took place via Zoom conference software.

Natasha. Natasha is a teacher at Lakeside Middle School. She has been teaching for 12 years and is currently teaching eighth grade mathematics, eighth grade algebra 1, and eighth grade honors algebra 1. She has prior experience teaching high school PSSA remediation, algebra 1, geometry, algebra 3/trigonometry, statistics, and AP statistics. She currently provides instruction to 12 gifted students in her inclusive mathematics classes, and estimates that five of those students are gifted specifically in mathematics. Her mathematics classes are 40 minutes long. She is the only teacher in her classes that contain gifted students. Natasha was never tested for giftedness. Natasha's formal teacher

training occurred in Pennsylvania. The initial and follow-up interviews with Natasha both took place via Zoom conference software.

Olivia. Olivia is a teacher at Lakeside Elementary School. She has been teaching for 27 years and is currently teaching fourth grade. She has prior experience teaching second and third grades. She currently provides instruction for one gifted student in her inclusive mathematics class, and that student is not gifted specifically in mathematics. Her mathematics classes are approximately 90 minutes long. Olivia was tested for giftedness but did not qualify. Olivia's formal teacher training occurred in Pennsylvania. The initial interview took place in Olivia's classroom and the follow-up interview took place via Zoom conference software.

Sharon. Sharon is a teacher at Lakeside Elementary School. She has been teaching for nine years and is currently teaching third grade. She has prior experience teaching fourth grade. She currently provides instruction for one gifted student in her inclusive mathematics class, and that student is not gifted specifically in mathematics. Her mathematics classes range from 75 to 80 minutes in length, depending on the day. Sharon has never been identified as being gifted. Sharon's formal teacher training occurred in Pennsylvania. The initial and follow-up interviews with Sharon both took place via Zoom conference software.

Steven. Steven is a teacher at Twin Pines Elementary School. He has been teaching for five years and is currently teaching fourth grade. He has prior experience teaching third grade. He currently provides instruction to seven or eight gifted students in his inclusive mathematics class, and he is unsure if any of those students are gifted

specifically in mathematics. His mathematics classes are 80 minutes in length four days of the week, and 110 minutes in length one day of the week. Steven was never identified as being gifted. Steven's formal teacher training occurred in Pennsylvania. The initial interview took place in Steven's classroom and the follow-up interview took place via Zoom conference software.

Wanda. Wanda is a teacher at Fallbrook High School. She has been teaching for 18 years and is currently teaching algebra, honors probability and statistics, and AP statistics. She has prior experience teaching high school geometry, integrative math, trigonometry/pre-calculus, and a Keystone preparation class. She provided instruction to four gifted students in her inclusive mathematics classes during the fall semester and is currently providing instruction to seven gifted students in her inclusive mathematics classes in the spring semester. Her mathematics classes are approximately 90 minutes long. Wanda was identified as being gifted and has a daughter who was also identified as gifted. Wanda's formal teacher training occurred in Pennsylvania. The initial interview and follow-up interview both took place via Zoom conference software.

Wendy. Wendy is a teacher at Harmony High School. She has been teaching for 27 years and is currently teaching high school pre-calculus and honors pre-calculus. She has prior experience teaching high school algebra 1, geometry, algebra 2, calculus, and applied algebra. She estimates that she currently provides instruction to 15-20 gifted students in her inclusive mathematics classes, and she is unsure if any of those students are gifted specifically in mathematics. Her mathematics classes are 45 minutes in length. Wendy was identified as being gifted. Wendy's formal teacher training occurred in

Pennsylvania. The initial and follow-up interviews both took place via Zoom conference software.

William. William is a teacher at Twin Pines High School. He has been teaching for five years and is currently teaching high school geometry and honors geometry. He has prior experience teaching seventh grade pre-algebra and high school algebra 1 and honors algebra 1. He currently provides instruction to eight gifted students in his inclusive mathematics class, and he is unsure if any of those students are gifted specifically in mathematics. His mathematics classes are 42 minutes in length. William was identified as being gifted. William's formal teacher training occurred in Pennsylvania. The initial interview took place in William's classroom and the follow-up interview took place via Zoom conference software.

Research Question 1

The first research question was: *What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?* Four themes emerged within this research question: challenging experiences, motivating or rewarding experiences, characteristics of gifted students, and building-level gifted support provided to students. Subthemes emerged within each theme; I describe each sub-theme in greater detail below. Table 3 lists the themes and subthemes that emerged from the first research question.

Table 3

Themes and Subthemes Within Research Question 1

Themes	Subthemes	Number
Challenging experience	Differentiating for gifted student	9
	Teaching in an inclusive classroom	8
	Unfamiliar with the gifted qualification process	7
	Gifted student not performing well	6
	Gifted student gets frustrated	6
	Teaching an exceptionally gifted student	6
	Gifted student missing math instructional time	4
	Doesn't have enough time	4
	Gifted paperwork and meetings	3
	Gifted student doesn't want to explain solution or show work	3
	Gifted student has an arrogant attitude	3
	Meeting a twice-exceptional student's needs	3
Motivating or rewarding experience	Providing appropriate challenge to gifted student	8
	Gifted student persevering through a challenge	6
	Experiencing gifted student's divergent thinking	5
	Seeing students be successful	5
	Building relationships with students	4
	Gifted students asking meaningful questions	3
	Gifted students growing socially, emotionally	3
Characteristics of gifted students	Possesses a natural curiosity	7
	Is high achieving	6
	Becomes easily frustrated	5
	Possess an above average IQ	4
	Not many similarities, every student is different	4
	Learns very quickly	4
	Is confident, perhaps overly confident	3
	Is creative	3
	Has difficulty persevering	3
	Is disorganized	3
	Lacks desire to explain solution or show work	3
	Requires extra preparation	3
Building-level gifted support provided to students	Gifted specialist exists in district	9
	Pull-out program with gifted specialist	6
	Students placed in higher level classes to meet needs	4
	Special projects assigned to gifted students (written into GIEP)	3

Challenging experiences. At the beginning of each interview, I asked participants to describe a recent challenging, motivating, or inspirational experience that occurred while they were teaching gifted students in inclusive mathematics classes. Eleven of the 12 participants described a challenging experience first. Overall, teachers described a greater number of challenging experiences with regard to teaching gifted students in inclusive mathematics classrooms than rewarding experiences. Four teachers discussed the same student during our initial and follow-up interviews. Three of the teachers described their interactions with the student as being a challenge, and one of the teachers described her interaction with the student as being rewarding. This teacher is the only participant who began our interview by describing a rewarding experience rather than a challenge. It was interesting to see that all four teachers had worked with the same student in the same district and had very different feelings about their experiences.

While describing recent specific challenging experiences that occurred while educating gifted students in their inclusive mathematics classrooms, nine of the 12 participants discussed difficulties differentiating specifically for their gifted students. Angela recalled the challenge she faced when differentiating for one particular gifted student,

> The part that was challenging for me definitely was, what's meaningful for him to do that's not just busy work that's still going to be worth his time, and how can I teach him while teaching 20 others how to do this?

Eight teachers discussed the challenge of teaching in an inclusive classroom, which Angela also alluded to in the previous statement. Cheryl described the challenge of meeting the needs of all of her students in one of her inclusive classrooms.

> It was difficult from a pacing perspective, I would say, because I felt as if I had to slow down my instruction. I had to do a lot of reviewing. I had to do a lot of reteaching to meet the needs of the mass of students in that particular class, because more of them had disabilities than didn't have disabilities. So, I felt as if I had a lot of trouble meeting the needs of my gifted students that year. As much as I tried to challenge them, I felt like my pace wasn't quick enough. I felt like I tried to ask as many higher-order thinking and higher-level questions as I could.

Seven teachers described a challenge that involved not completely understanding how their students are identified as being gifted, or being unsure of the general process that is followed at their school. For example, Steven described a student who was identified as gifted at a different school district and later moved into his school. Steven commented,

> I don't see any way that she's gifted. She's not in the high math. She's not even close. She's on grade level exactly for reading. And that's why I'm like, that has to be super subjective. I don't have her for math. She didn't even score advanced on PSSAs on that. And like I said, she's grade-level for reading. Like, barely grade-level. And she's gifted.

Half of the teachers described experiences of gifted students not performing well. For instance, Wendy commented, "I do remember one last year, but that student was having trouble in my class…he was really an underachiever. That's kind of been my

experiences with the ones that stick out, which is odd." Wanda shared a similar challenge with one of her gifted students.

> I currently have a student that's identified as gifted that is really throwing me for a loop and in the 18 years I've taught [gifted students], I've never had this happen. I have a student who's failing, and he's gifted, and I've had students fail, but usually it's because they don't belong in the class, they didn't really make the cutoff, but their parent wanted them to take the class. He is an anomaly. There's no reason academically why he's not passing. But then, when you look at his attendance, he's an athlete, he's a golfer, and so he missed a ton of school in the beginning of the year and with statistics the way, how it just is, it accumulates. He doesn't know what any of the symbols mean. He can't use any of the formulas and so it's challenging right now and he just threw in the towel. I talked to mom and we've been on the phone and he's just going to actually retake my course next semester and he's just like, "I'm done, I'm just going to start fresh."

Natasha shared a few experiences about gifted students performing below her expectations.

> Last year, I had two gifted students in one of my regular algebra classes, not the honors class, and it was a challenging situation in that they were ... well, one student did very little homework, and it was frustrating to me to see a student just kind of not reaching their potential. I'm pretty sure his area of giftedness was not mathematics, so it really wasn't his area of interest, but it was still frustrating to just have him be satisfied getting a C when I just felt like he could've done better.

> And then the other gifted student in that class did some homework, but I guess my frustration there was that he didn't ask questions. I think he would've done better had he asked a question or two.

Natasha shared another story that began as a challenging experience, but had a positive outcome after she continued to work with the struggling student.

> Most of the gifted students who are in my honors algebra class did really well on a recent project. But there were one or two who seemed to overlook the directions or really not pay attention to the directions and the required components of a recent project where they had to write the equation of a parallel and a perpendicular line, given a line and given a point. And then they had to show pictures of their work in a Google Doc and then they had to talk about it. And there was one student, one student I'm thinking of in particular, who didn't show their work… and the talking part, the audio part was supposed to be about the work and all they talked about was the graph. So that was disappointing. But the good news was when I gave the feedback and said "this is what you did wrong, or this is what the project is missing, please correct and resubmit," they made the effort to correct the issues and resubmit. In fact, I just got the email and I was just looking at this project a few minutes ago. And the resubmission is much, much better than the original.

Additionally, half of the teachers shared stories about gifted students becoming frustrated. Chad discussed an experience about a gifted school student whose lacking organizational skills may have contributed to his frustration.

> He is very intelligent, and I think part of his challenge is not so much his academic piece, but now it has become the organizational piece. Due to the structure of our building being divided the way it is, they have a lot of rotations. It's very similar to a middle school setting. They rotate to reading classes, science classes, social studies classes ... constantly on the move. This particular fellow, his organizational skills, he leaves a lot of the things he needs for class in other rooms, at home, which we can navigate because I can always give him a copy of something, this or that, but I see it more in his body language and it's almost that he's not used to the struggling piece of things, and he doesn't know how to handle it.

Brandon also described the challenge of trying to help a gifted student work through frustration issues, seeming to stem from being overwhelmed with the high school workload that is expected of them.

> I also remember, though, he was getting more overwhelmed because he was also in AP stats, AP government, AP science ... I could remember talking at the beginning of the year. He's like, "Yeah, I get a little overwhelmed with some of the stuff."

Angela shared an experience about a frustrated gifted student that began as a challenge and ended as a rewarding experience.

> We were doing multiplication algorithms, so three-digit times two-digit multiplication. Previously up through fourth grade, she would only multiply with partial products. She never moved to the full algorithm. With the fourth grade

numbers, the partial products worked just fine for her. The numbers weren't that big, she was really quick with doing it, she didn't ever learn the algorithm and it worked out well. This year, I told her, "Well, you can keep doing that. That is going to work; it's going to get you there. However, our numbers are going to get a lot more complicated and you're going to have a whole list of partial products that you're adding that I'm not sure that's going to be better for you. I think you're more likely to get lost; it's going to get confusing. The algorithm might be a better way to go." In the beginning, she said, "Nope." Didn't want to learn it, didn't want anything to do with it. She, when challenged with something, sometimes doesn't want to take on that challenge, and so she stuck to her guns with her partial products. Then when it was thousands times hundreds, she just couldn't do it anymore. The numbers were too big … it was too much. So she said, "I don't think I can do this anymore," and I thought it was awesome that she realized she reached her limitation. She wanted help, and then we did. We went back and, "Okay, so here's how you do it." We went through it. It took her a little bit of time, and she was clearly uncomfortable and unhappy with it, that as she was learning it, she was bothered that she wasn't as fast as everybody else and it took her longer. She did not enjoy learning it at all, and it would've been so easy for her to just say, "Forget it. I give up. I don't want to do this," but she didn't. She got it, and it's not a problem at all for her anymore. I thought that was a very positive experience for both of us … She was very uncomfortable with the struggle, yes.

Six of the 12 participants also shared specific challenges about trying to teach exceptionally gifted students. Sharon shared a story about a challenging experience trying to meet the needs of an exceptionally gifted student.

> I had a girl in my room who was exceptionally gifted in math. She was far beyond the third grade level and she goes to the gifted teacher. She went once a week, but what we were doing in our curriculum was way below her. So they kind of toyed around with moving her up to the next grade level just for math. They decided not to do that. So instead, the gifted teacher would give her like project-based math things that she would have to do, but she had to do them separately out in the hallway by herself and while I was teaching my class, and then she would come in early in the mornings and she and I would kind of work over the things that she was doing on her own. At first, it seemed very cool. She was excited about it. But then after a while, she started to feel very isolated, because she had to go out on her own and she didn't get to really talk to the other kids about what she was doing. In the end, I did have her kind of present some of her findings, just so she didn't feel totally disconnected from the class. But then the following year, they actually didn't do that, because she just wasn't enjoying it, because she was so separated from everybody else. So it wasn't a great experience for her, I think, just because it was so separate.

Pam described a situation when one of her gifted students got all of the questions correct on a pretest for a unit on two-digit division.

> It was a challenge for me. "Okay, what am I going to do with him for the next two weeks, because he doesn't need to hear this?" So he worked at the back table. Well he and I, we talked about this and I showed him his paper. I explained, "This is great," how this part went well, "Here are the parts that we're going to practice." He worked on some different things at the back table on his own so he could go at his own pace. I did have him do some long division problems, but not nearly as many as everybody else. His got a little more involved; for example, it got to decimals where you talked about how you use a decimal instead of a remainder. So he went a little deeper with it, but then he did a lot more problem-solving with it. Then when the check part was part of the instruction, when we talked about that, he joined us for that. He only needed to be there for about five minutes because as soon as he saw what we were talking about, he said, "Oh yeah, I know how to do that." I think one of the parts, it was very cool that he knew how to do it and he was very proud, and I was very proud, so that part was a very good feeling. The part that was challenging for me definitely was, what's meaningful for him to do that's not just busy work that's still going to be worth his time, and how can I teach him while, teaching 20 others how to do this?

Two subthemes were mentioned by four of the teachers: specific challenges related to gifted students being pulled out of class and missing instructional time, and not having enough time to accomplish their curriculum goals. Four teachers discussed four subthemes: feeling challenged by the required gifted paperwork and meetings, gifted students who don't want to explain or show their work, teaching gifted students who have

arrogant attitudes, and the difficulty teachers experienced trying to meet a twice-exceptional student's needs. Twice-exceptional students are those students who are identified as being gifted and also having a learning disability.

Motivating or rewarding experiences. While describing recent specific motivating or rewarding experiences that occurred while educating gifted students in their inclusive mathematics classrooms, eight of the 12 participants discussed feeling a sense of reward when they provided an appropriate challenge to a gifted student. Wanda described a specific story about when she went out of her way to accommodate a gifted student's needs because the appropriate class for him was not being offered at her school at the time.

> I have one student that was gifted and this was before we offered AP … he decided he just wanted to go above and beyond and take the AP test and so … he got the AP books and just self-studied and would ask me questions here and there. If he would do the practice test and get something wrong, we would discuss why, and he did amazing … and then he ended up getting a five on the AP test. Now he's an actuary and so he works for Hartford Insurance, up in Connecticut. He's taken every single actuary exam; he just passed the last actuary test … and now he's like a full (actuary), and I still talk to his mom; his parents go to my church so I still see them all the time. So, it's really awesome to see a kid be so successful, who's so motivated to push himself and to do well. I love those kids who are really willing to advocate for themselves and are motivated … to have all

> the things, to be motivated, to want to do it, to have the brain to do it, have everything, have it all together.

Cheryl had a specific story to share about when she advocated for her school district to meet the needs of one of her exceptionally gifted students.

> I had talked with him and his family, and we have a gifted support teacher at school. The students receive a resource period with that gifted teacher three times per our six-day cycle for 50 minutes. That is a pull-out program, so I had consulted with her. [The gifted teacher] is also the one who writes the IEPs for the gifted students. I said, "This student is just going above and beyond. He asked for the second set of our textbook. He was learning units ahead of time on his own, asked if he could work ahead and things like that." So I said, "We need to do something for this student." So, I met with the principal. He had to also talk with our assistant superintendent to get some permission for things. But what we eventually did is allowed him to quickly move through the sixth grade curriculum and essentially test out of the sixth grade curriculum, and then he was allowed to do an online version of the seventh grade program. He went ahead a grade, so that way he did sixth and seventh grade material in the classroom. We thought it would be good for him to remain in my classroom because we had a good rapport. He also had some behavioral difficulties, so we thought it would help him to stay focused, staying in the same classroom but working on the computer. I think it was successful, and I'm glad that I ... I call it fighting for those students, but the parents were really appreciative for that. I could have just let him go through the

> regular course and earn 100s on every test and maybe be bored on some days. I'm glad that we found a way to challenge him and work up to his ability and things like that. I was taking any advancement that I could for him because I was happy they agreed. It took two or three meetings with my principal and with him talking to the assistant superintendent and superintendent about the situation before they would move forward with this. I'm not sure if it's relevant, but this student in elementary school was not challenged as much as his family had hoped, so they pulled him out and cyber-schooled him for a year, and he ended up skipping a grade that way by enrolling in cyber-school. I approached the situation as, "I don't think we want to lose this student in our physical school again," and I felt as if we needed to meet his needs in the physical school versus having his family pull him out again.

Half of the teachers described feeling rewarded when their gifted students persevered through a challenge. Angela reflected on her feeling of pride when one of her gifted students persisted through a challenge in her class, expressing, "it was very cool that he knew how to do it and he was very proud, and I was very proud, so that part was a very good feeling." Angela shared another story about a student persevering through a challenge, and the joy it gave her as a teacher.

> I'm not sure who was happier, her or myself. When I pointed it out to her, "Look at what you're doing, and you're not even really thinking about it anymore," and she said, "Yeah, this is definitely easier." "Yes, and really appreciate how far you went to get here. That is awesome."

Five of the participants described feeling motivated by experiencing students' divergent thinking. Five teachers said that seeing their students being successful is rewarding. Olivia shared the following story.

> This year, we haven't done fractions yet. We haven't touched them formally in my math instruction, but I have this group of kids who can multiply and divide fractions you put in front of them and they understand. I love to be able to watch them. To me, it doesn't so much matter that they're identified. It's how they're performing, so some of my top students are not gifted, which is always great to see as well.

Four of the teachers said they feel rewarded when they build relationships with their students. Three of the participants mentioned feeling rewarded or motivated by gifted students asking meaningful questions, and by gifted students growing socially or emotionally.

Characteristics of gifted students. Participants' descriptions of the characteristics of gifted students they have taught varied greatly. There was no overwhelmingly common response. The most-agreed upon description given by seven participants was that gifted students possess a natural curiosity. Brandon, for instance, described gifted students as being more inclined to ask questions.

> They have no problem asking why this happens or, how does it apply to other things? That's, to me ... when I see a gifted student ... that's what I would classify as gifted. They're comfortable asking why, not to annoy the teacher. They want to know. They want to know why that happens, things like that. That's, to me, if I

> were asked what makes a student gifted, obviously they are smarter, but even that ... I've had gifted students who maybe even struggled with certain concepts, but they were more inclined to ask why.

Cheryl's response was similar, but she related it to student interest. "They need to see the why in things like, 'Why would I need to learn this? Why would I need to practice this?' In order to make them have a little more interest in it."

Natasha's description of gifted students also fell under this subtheme.

> Then there's other gifted students who ask amazing questions and make me think and it's like, "Well, I've always done it that way, but I'm not 100% sure why." You know? "Why do we express probability as a simplified fraction? Why don't we just leave the initial fraction there?" Some gifted students think more deeply about things, like they'll think about it and think critically and not just accept a basic surface understanding. Some really want to understand why things happen the way they do.

Six of the participants described gifted students as high achieving. Angela commented that gifted students tend to be "academically high achieving or musically high achieving or artistically high achieving." Natasha commented that "there's probably a criteria of a certain grade point average to be considered for (gifted) evaluation." Olivia suggested that achievement is one component of giftedness, but that there are other contributing factors as well.

> Not that that's the end-all, be-all, but it's certainly one indicator, and then we look at their classroom performance, "Yes. That student has been performing higher. Oh, and now we have this piece of information and this piece of information."

Five of the participants said that gifted students tend to become easily frustrated. Three responses were cited by four of the participants: gifted students possess an above average IQ, gifted students tend to learn very quickly, and gifted students don't share many similarities and tend to be very different from each other. Six subthemes emerged were mentioned by three participants each: gifted students are extremely confident, gifted students are creative, gifted students have difficulty persevering, gifted students tend to be disorganized, gifted students lack a desire to explain solutions or show work, and gifted students require extra preparation on the part of the teacher.

Building-level gifted support provided to students. During the interviews with participants, a number of subthemes emerged about ways that schools are meeting the needs of gifted students in addition to strategies they are using in their own classrooms. Nine of the teachers mentioned that their district employs one or more teachers who serve as gifted specialists. In Brandon's case, the gifted specialist may appear to be overextended and not always available to support the teachers and students. "We do have a GIEP coordinator, but even she's overloaded with everything she's doing. She still has a half schedule of classes, so even that's ... She can't be overseeing everything and that."

Six of the teachers discussed that their gifted students are regularly pulled out of their math class to receive support from the school's gifted specialist. Chad described his school's gifted pull-out program with a bit of disappointment due to the fact that the rest

of his students could also benefit from the projects the gifted students are working on. "We have a gifted program here, and they'll get pulled out and they're doing like robotics, and they're doing all kinds of things. Things I think that 90% of my class could benefit from." Olivia mentioned that her gifted students sometimes spend "three quarters of their day somewhere else, and the (other) kids know that, and that they're going to a special class."

One-third of the teachers shared stories about their gifted students being placed in higher level classes in order to have their mathematics needs met. Three of the teachers talked about their gifted students having special projects written into their GIEPs. No additional subthemes emerged from Research Question 1.

Research Question 2

The second research question was: *What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?* Seven themes emerged from the respondents' answers to this research question: obstacles encountered while teaching, rewards gained from teaching, ways teachers can make a difference in students' lives, formal training received that could be applied to teaching gifted students, informal training received that could be applied to teaching gifted students, teacher needs, and teacher self-evaluations. Table 4 lists the themes and subthemes that emerged from the second research question.

Table 4

Themes and Subthemes within Research Question 2

Themes	Subthemes	Number
Obstacles encountered while teaching	Differentiating for gifted students	10
	Teaching in an inclusive classroom	9
	Unfamiliar with the gifted qualification process	9
	Gifted students not achieving well	8
	Gifted students get frustrated, don't persevere	7
	Teacher doesn't have enough time	7
	Gifted students pulled out from class	6
	Students exceptionally gifted, far beyond others	6
	Gifted student has arrogant attitude	5
	Gifted student doesn't want to explain solution or show work	4
	All students should have enrichment opportunities, not just gifted	3
	Gifted paperwork and meetings	3
	Gifted students working very fast or very slow	3
	Teaching with inflexible curriculum	3
	Lacking GIEP support	3
	Math is a difficult subject to differentiate	3
	Other students jealous of gifted students	3
	Gifted students with social or maturity problems	3
	Meeting the needs of twice-exceptional students	3

(continued)

Themes	Subthemes	Number
Rewards gained from teaching	Providing appropriate challenge to gifted student	8
	Experiencing gifted student's divergent thinking	7
	Gifted student persevering through a challenge	7
	Students being successful in math, life	6
	Building relationships with students	5
	Gifted students taking leadership roles	4
	Staying in touch with former students	4
	Gifted students asking meaningful questions	3
	Gifted students growing socially, emotionally	3
	Student's deep understanding of math	3
	Students enjoying challenge	3
	Student's love of math	3
Ways teachers can make a difference in students' lives	Pushing students farther	7
	Preparing students for college, careers	4
	Helping develop an appreciation for math, learning	3
Formal training received that could be applied to teaching gifted students	None that is gifted specific	8
	Differentiated instruction	7
	Geared toward struggling learners	7
	Not much training	3
Informal training received that could be applied to teaching gifted students	Discussions with other teachers	7
	Discussions with gifted specialist	6
	Teachers are gifted themselves	4
	Internet searches	3

(continued)

Themes	Subthemes	Number
Teacher needs	How to stretch gifted students farther	10
	Gifted-specific differentiation	9
	Don't want to push gifted students too far	6
	More collaboration between math teachers	6
	More time, better time management	6
	Challenging gifted students while also helping lower students	5
	Finding more resources for gifted students' different needs	5
	More exposure to problem-based learning activities	5
	More training in general	5
	Math-specific gifted training	4
	How to handle gifted students' socio-emotional needs	3
	More collaboration between teacher and gifted coordinator	3
Teacher self-evaluations	Average	7
	Trying to differentiate is a strength	6
	Experience is a strength	5
	Content knowledge is a strength	4
	Above average	3

Obstacles encountered while teaching. After teachers described specific challenging or motivating experiences that occurred while teaching gifted students in their inclusive mathematics classrooms, I asked them to describe general obstacles they faced in order to understand factors that may negatively impact teacher self-efficacy. A number of subthemes repeated from Research Question 1. Just as the challenging experiences outnumbered the rewarding experiences in Research Question 1, the obstacles outnumbered the rewards in Research Question 2.

Ten of the participants mentioned that it is difficult to differentiate for gifted students. Nine participants said that teaching in an inclusive classroom is challenging,

and nine also said that they struggle with not having a strong understanding of the process used to identify gifted students. Cheryl is one of the participants who expressed concern over students being identified as gifted even though they don't necessarily demonstrate giftedness, especially when they move in from a different school district.

> I know we had some difficulties with students coming into our district with gifted labels from other places. But then, when they come to our school, they've really struggled, sometimes even failed classes and things like that. Has anyone mentioned that? Mainly students coming from the city into the suburbs, and I know their IQ levels are different in different districts ... some districts have other processes and things involved in identifying students as gifted. I find it difficult sometimes to meet the needs especially of those gifted students when I'm essentially just trying to get them to pass in the first place and then meet their gifted needs as well.

Nine of the teachers spoke about the challenge of gifted students not performing well in their math classes. Seven teachers talked about encountering the obstacle of gifted students getting frustrated or not persevering. This subtheme emerged in Research Question 1 in the participants' stories about specific students, and in a more general sense within the realm of Research Question 2. Olivia shared a story about this frustration stemming from gifted students' tendencies to compare themselves with the non-gifted students in the class.

> They compare themselves to the other people in the class that aren't gifted. Many times and ... in my math classroom right now, my kids who are my best math

> students aren't my gifted students, so it frustrates them to see that there are other kids who aren't gifted who are flying in math.

Seven teachers also expressed feeling as if there is not enough time to meet all of their students' needs. Brandon, for example, commented on frequently running out of time while trying to meet the needs dictated by the diverse levels of understanding possessed by the students in his inclusive class.

> Well, I mean, we were already dealing with the issue of the different levels of classes. So, you're already focusing on that aspect. You do questions that the average level kid understands, but then you're going back. Kid says, "Well, can you explain how to do that?" As a teacher, you always want to make sure they understand it. But you're already looking at the clock more, going, "Okay, that's now just three or four minutes I just lost from doing the lesson." How do I do that? Usually in that high level thing, that's when I try to adjust it at the end of the period. There were times where I never got a chance to go over a question like that.

Six teachers shared stories of being challenged when gifted students are pulled out of math class for GIEP meetings and project support. Six teachers also discussed struggling with meeting the unique needs of gifted students who are exceptionally gifted and perform well above others, and some even mentioned that they felt personally intimidated by exceptionally gifted students and the level of mathematics knowledge they possess. Steven admitted there have been times when was intimidated by exceptionally gifted students.

> I would say my challenge is that some kids who are super, super smart ... they give examples that I would have never thought of in my entire life. And I've got to try to, on the spot, think of and say, "Yeah, that's a great way of doing it, and can you explain it to the class?" So, I don't look, you know ... So, I don't look bad in my experience. So, we do a lot of that, like when they're doing fractions. And the kids can convert them right to decimals, like so fast. Or multiplication, that's a lot of stuff that we're doing in fourth grade. On the spot I'm like, "Oh, yeah, that's a great idea." But ... how do you get that?

Exceptionally gifted students also pose additional planning struggles for the teacher. Angela commented about one of her exceptionally gifted students, "It was a challenge for me. 'Okay, what am I going to do with him for the next two weeks, because he doesn't need to hear this?'"

Five of the participants said they encounter students with arrogant attitudes that pose an obstacle for them. Sharon stated, "I think that side of gifted students is sometimes the negative, because they feel the need to show everybody else … 'I'm better,' and it's not all of them, but I have seen that a few times."

Four of the participants shared stories about having gifted students in class who refuse to explain their solutions or show their work when pressed by the teacher to do so. The final nine obstacles were all mentioned by three teachers each. One subtheme was that teachers feel that all students should be provided with enrichment opportunities, not just gifted students. Teachers also view completing GIEP paperwork and attending GIEP meetings to be another inconvenience, especially when they provide instruction to a large

number of gifted students. Teachers spoke about having difficulty meeting the needs of gifted students who work either very fast or very slow as compared to the rest of the students in the class. Teachers said that inflexible curricula make it difficult to differentiate for gifted students. Teachers mentioned that they often lack support in meeting their students GIEP needs, or even understanding what is written into the gifted student's GIEP. Three teachers noted that math is a difficult subject to differentiate for gifted students. Teachers struggle with non-gifted students being jealous of gifted students because of the additional attention they receive and the extra opportunities they are given. Another obstacle teachers cited is having gifted students in class who lack social skills or demonstrate immaturity. Lastly, teachers mentioned struggling to meet the unique needs of twice-exceptional gifted students, those who also receive learning support services.

Rewards gained from teaching. In order to understand factors that positively impact teacher self-efficacy, I asked teachers to describe general rewards they experienced from teaching gifted students in inclusive mathematics classrooms. A number of subthemes were repeated from Research Question 1, where teachers were asked to describe recent specific positive experiences. Even though the obstacles participants cited outnumbered the rewards, teachers did share stories about teaching gifted students that left them feeling fulfilled.

Eight of the participants discussed feeling a sense of reward when they are able to provide appropriate challenges to gifted students. Steven's excitement for teaching higher

level concepts shone through during our interview. His eyes lit up as he described working with the higher level mathematics students.

> But I like working with the enrichment kids. It's motivating for me, 'cause I just basically want to teach math because they can get it. And I can just go into these crazy things, like the lattice method in multiplication. Some kid would never in a million years understand how that works, and these kids eat it up, and they love it.

Teachers also discussed feeling rewarded when they experience a gifted student's divergent thinking, as well as seeing a gifted student persevere through a challenge; those subthemes were mentioned by seven participants each. Six of the teachers interviewed felt a sense of reward when they learn that former students are successful in subsequent math courses or later in life. Five of the participants commented that they felt a sense of reward through building relationships with their students. In particular, William spent much of the interview time speaking of the importance of developing and maintaining positive student relationships. When asked to identify his strengths, William provided a salient response; however, there were not enough mentions of relationships for it to be a subtheme for that particular research question. Nevertheless, William's opinions regarding his strengths are relevant to this study. When William described how he is able to connect with his students, I could feel the passion he has for teaching and the rewards he experiences when strong student-teachers' relationships are developed. William said,

> I think the biggest strength might not even be in math itself. I think it's just the kind of relationship that I have with my students that I think helps aid in the gifted process, that they feel comfortable asking me for help with this, or asking

> questions about this goal or that goal. They don't feel like I'm unapproachable for those kinds of things. That I think is probably more important than the actual math itself, for them to just feel comfortable with me to ask those kinds of things, and then for me to find the content for them is kind of ... I don't want to say an afterthought, but it's kind of an afterthought. That's the easier part, I think. For them to be able to have that connection to ask those kinds of questions is sometimes harder than actually doing the work itself, so when they feel comfortable with somebody and for them to feel like they can come to me and ask, "Hey, I'm looking to do this. What kind of things do you have?" Or, "What kind of advice do you have about this or that?" I think sometimes for the gifted kids it's harder to find that kind of connection with the teacher, to feel comfortable asking ... I feel like that's probably my biggest strength. After that, the math just kind of follows along. I think that's the easier part of the deal.

Four of the participants described the following rewarding experiences: having their gifted students take on leadership roles in the class and having former students make an effort to keep in touch with them. Five subthemes emerged with three instances each: experiencing gifted students asking meaningful questions, experiencing the growth of gifted students socially or emotionally, knowing that a gifted student has acquired a deeper understanding of mathematics, seeing gifted students enjoy a challenge, and experiencing a gifted student's love of mathematics.

Ways teachers can make a difference in students' lives. When I asked teachers how they felt they could make a difference in their gifted students' lives, three subthemes

emerged. The first subtheme, with seven respondents, was that participants felt they could improve their students' lives by pushing them farther in their classes. Brandon made a comment that echoed the purpose of this study.

> I know, if they've been identified, somebody's seen something in them, so what can you do to kind of keep pushing them? Because those students, the ones who rise to the top, they're the ones that we see making news. So you want to be an influential factor to them. I don't know ... you don't want them coming back and going, "Okay, yeah, he was just a regular teacher, taught the regular class, nothing special ... You know, he challenged me. He made me think, kept pushing me and things like that."

Cheryl spoke of not only providing challenge for her gifted students, but also serving as an advocate for them.

> I try my best to challenge them as much as I can. I have some different types of assessments. I have some projects that are on the same topics or concepts, but they're slightly different from the ones that the rest of the students receive … I think that advocating for them is another big thing because since IDEA (the Individuals with Disabilities Education Act) and all of the laws and all of the standardized testing and things, I think that we do focus more on the needs of students with disabilities, and we don't spend as much time as we should as an educated society meeting the needs of the gifted students and challenging them. So I try to advocate for them as much as I can. I try to give them as much of my little bit of time as I can to help them. I see a lot of these gifted students as the

> future of our society, if you will, so I try not to leave them behind, and I don't know how to explain it. But if there's a time when I can share a voice about it and make sure that our higher-level students' needs are met, I share my thoughts with however many people are around. I try my best … I mentioned that the district really isn't doing their own testing, and I wish we would. Because as much as I enjoy helping students with needs, I do think there needs to be a balance, and I don't think we can sacrifice the needs of the gifted students. They do have so much opportunity, and we need to challenge them. We need to move them forward and just not have them being okay, because their grades are fine, and they're doing fine in all their classes. That's wonderful, but they could really make more advancements if we advocate for them. I do try.

In the second subtheme, four of the participants felt they could help prepare their students for college or careers in mathematics. I could sense the confidence in Wanda's voice as she spoke of the potential difference she could make in her students' lives.

> I can make a difference. Maybe just to encourage the math; maybe not if they don't want to be a teacher, but to do something in math, to be an engineer, to be a statistician. So many kids, they don't realize what stats is until they get in here and then they're like, "Oh, this is completely different than trig or algebra or calculus." So many kids … you don't do calculus for a career, but you can do statistics for a career. And so, I like pushing kids in that direction that they can see that this is real math and so, I don't know if, it's not really specific to gifted

> students. I think for any student, just letting them … making them aware of what statistics really is.

For the third subtheme, three of the teachers mentioned that they could make a difference in their students' lives by helping them develop an appreciation for math or learning. touched on the reason why he decided to pursue a career in education.

> Well, I guess in the end, it comes down to why I became a teacher. I want to do the same for them as what teachers have done for me. Being able to pass that along to somebody else, not to like guide them to become a teacher, but just teach them to enjoy the new things that they've learned.

The responses that fall under this subtheme likely all contribute to teachers' feelings of positive self-efficacy.

Formal training received that could be applied to teaching gifted students. My discussions with teachers about the formal training they received with regard to teaching gifted students in inclusive mathematics classrooms revealed that there is insufficient training available to teachers, at least in this region of the state. Eight of the participants mentioned they have never received formal training specifically focused on meeting the needs of gifted students. When I asked Chad about his formal training received, he said "there has been no professional development in this field for me." Similarly, Steven reported, "through the school, absolutely nothing." Wanda echoed this response, "None, nothing." Sharon had a conversation with her school's gifted coordinator that indicates they may be lacking in training as well.

> I actually, I talked to our gifted teacher about that, because I told her you were interviewing me for this and she said she hasn't even really ... she is the gifted teacher but there really isn't gifted training and, she's just kind of fell into that role, but she never really even had training either. She said she kind of had to train herself.

Seven participants mentioned participating in formal college coursework or district-offered professional development that was centered on differentiated instruction, and in a few instances, strategies that could be applied to gifted students were briefly mentioned. Wanda participated in a district training during the 2018–2019 school year during which she was given the choice to select from various topics. She chose the training on differentiation and described it for me.

> So we did have professional development yesterday and … we had to pick different sessions, and one of my sessions that I did choose was differentiation… That differentiation doesn't have to mean take a lesson and water it down. It can also mean [making a lesson more challenging for the gifted kids]. So we had a little bit of focus, even though it wasn't specific for kids with GIEPs, but a little bit was there… we just focused on like here's this task and here's how you can, you know, phrase the questions a little bit differently so that you get a different outcome from your honors and upper-level kids.

Olivia discussed a district-wide push to train teachers on differentiation strategies at her school.

> Our school district has put each teacher through differentiated instruction training. Within the last two years, every teacher has been trained in differentiated instruction. So we have been formally trained in that because that's a big push, not just for gifted students, but just all of our students to work at their level in appropriate ways.

Natasha's school district also recently trained all of its teachers in differentiation strategies.

> And then formal training provided by our school district, we definitely had ... I don't even know what to call it, but our professional development for a year or so was focused on differentiation. So, while that is not specific to working with gifted students, I think it's really important, and it's an important part of working with gifted students. So, differentiation was definitely emphasized. We all went through like a yearlong kind of training.

Seven teachers also mentioned that the focus of any formal training is typically geared toward meeting the needs of the most struggling students, rather than helping provide appropriate challenges to gifted students. Sharon explained, "our district sent everybody to a differentiated instruction training where it went into a little bit of giftedness, but a lot of that was more focused on the lower kids and differentiating for them." Chad had a similar experience:

> I did, yes, in differentiation, but it all gravitated toward the lower end of the spectrum and not the gifted. It was always like … "don't forget about your gifted." It was always focused on the lower end of things.

Steven described a similar type of experience, “Everything’s been targeted towards the super low kids, and getting their scores up higher. It’s been nothing on enrichment.” Before Wanda’s recent training on differentiated instruction, her experiences mimicked the others as well.

> Anytime we talk about differentiation, it’s always geared towards the low kids. I always say those high flyer kids always feel forgotten, and actually it’s the middle of the road kids who I feel the worst for because there’s nothing for [them]. At least the high flyer kids, they can get pulled up and they have extra stuff for them to do, the low kids, they get pulled up and get help, but then your middle of the road kids, “sorry, there’s nothing for you.” So yeah, I’ve never had any formal training. Nothing that I’ve ever done. Everyone’s worried about the low kid.

Three of the teachers said they have not received much formal training with regard to meet the needs of gifted students in their inclusive mathematics classrooms. Cheryl commented, “I have had little to no training at all on gifted education.” William had a similar response, “Formal is almost… I don’t want to say it in a bad way, but almost non-existent.” Angela took one elective course on her own because she is passionate about the topic of educating gifted students. In the absence of that class, her response would have been the same as the others.

> My first thought was, “Well none.” Through undergrad and grad school, there wasn’t any. Well, and if I hadn’t sought it out, my answer would have been “none.” There wasn’t any required; I don’t remember any in undergrad or grad school. My master’s is in elementary education, and if there was any, it was

> unmemorable because I really don't remember it at all. I happened to seek out the course because it interests me and I like it, but other than that, there wouldn't have been any.

Informal training received that could be applied to teaching gifted students. As it became apparent that participants did not experience many formal training opportunities in the area of gifted education, I asked the teachers to share any informal ways they have been able to seek out resources or learning in order to better meet their students' needs. Seven of the participants said they acquired strategies and resources through discussions with other teachers. Half of the participants mentioned having discussions specifically with their school's gifted specialist. Sharon is a teacher who frequently seeks out the help of her school's gifted specialist.

> Well, usually, if I have a question, I talk to the gifted teacher. She doesn't teach in my building, but she's up here occasionally and I grab her and we discuss what's going on with the gifted student that we share and she'll give me some ideas. She's the one who helped me with that student a few years ago when we needed to come up with those project-based things for her to do … So she's kind of my go to resource, but she's not in my building … So I can't go to her all the time, but when she's here, I try to nab her and she'll help me out with it … She does two elementary schools and then she also does some of the high schools.

Four of the participants said they relied on their own gifted experiences when trying to come up with ways to meet the needs of their gifted students. Wanda felt that

her experience of having a daughter who is identified as gifted has helped prepare her for meeting the needs of her gifted students in her inclusive mathematics classes.

> Maybe just because with having my own child being gifted and I know how she is. I kind of apply that with other kids. I think so many times kids who have GIEPs sometimes are a little bit socially awkward, so just being able to have a conversation with them to help them come out of their shells a little bit. I just find that's definitely that way for a lot of really bright kids. Sometimes they don't have the social end of it.

Additionally, three of the participants said that they gathered information and resources via the Internet.

Teacher needs. When I asked teachers to describe their needs with regard to meeting the needs of their gifted students in their inclusive mathematics classes, two predominant subthemes emerged along with several additional subthemes. Ten of the teachers expressed a need for ways to stretch their gifted students even farther. Sharon expressed a desire to provide her students with an additional challenge.

> Just kind of how to go, like I said, beyond my own curriculum and how to know where to push them and just taking it beyond that program that I feel that we're kind of stuck in. I think it's just because you are in a specific skill. So right now, we're learning about multiplication. Well, if they know all their multiplication facts, it's harder to push them into something they do need to know, because I'm one person and I need to be teaching multiplication to the rest of [the students], where with reading, it would be easier. 'Cause like I said, I could grab a book and

> they could still work on the same skill, but in a higher level book. I wish I could stretch them even further.

Wendy reflected on her class of high-achieving students and acknowledged that a few of them could be pushed farther, even though she did not think it is a widespread problem in her class.

> Especially, I mean, in all honesty, when I look at my honors kids ... I'm probably talking about two or three kids in a class, tops, that I think they're not challenged enough. I mean, probably just giving them adequate challenge without making them feel like it's extra work or something like that, because even in my honors classes, as much as I have a lot of kids who are complaining that this is too hard, I know I have a couple that aren't being challenged, that are kind of sitting there just goofing around. They're just halfway tuning in and they're doing great. So, those are the kind of kids we're talking about, and I know that what I'm doing for the masses, what's challenging the masses is not challenging those couple of kids.

Brandon had conversations with his students about the importance and benefits of providing them with challenging opportunities to work through. Brandon shared,

> I used the one example with kids. I said, "If all you do in batting practice is have somebody throwing 40 mile an hour softballs out at you," I said, "what good is that?" I said, "You need somebody out there giving you some rockets to better yourself up."

Wanda said that although honors and AP courses may inherently provide many gifted students with the challenges they need, if a student doesn't enroll in those courses, their

gifted needs may not be met, because there isn't any training that exists for increasing the challenge in higher level mathematics courses.

> Yeah, I feel like we don't get any training. I don't know how else teachers are expected, I wouldn't even know where to begin for like, how am I expected to meet the needs of these really high level kids other than being on the parent end … We meet the needs through providing your children with honors and AP courses. So, if your kids don't qualify for honors and AP courses then they really, basically they just need to be challenged and here's their opportunity to be challenged. So, we don't really get any kind of formal training because I think they have the availability of the challenging courses.

Wanda went into greater detail about why she feels challenging gifted students is so important.

> So many of these kids, everything comes so easy to them that I don't want the first time that they're challenged to be in college or the first time that they have a setback to be in college. That worries me for so many of these kids because they've never had, they've always had everything so easy and coast [along]. And then you don't really know how to study and then you get to college and you're blown away. You don't know how to handle it. And I think that is kind of for a lot of your, not just gifted kids, but just your super smart kid. So, and sometimes motivation to be challenged. They get turned off by things that are too difficult, if something's really hard, they don't want to do it because I think they're afraid to

> fail because they've never failed. So, I think just trying to challenge them and let them experience failure.

Nine of the teachers described a need for gifted-specific differentiation strategies. Chad said, "I don't want to give them a bunch of busy work. I want them to have purposeful, meaningful challenges presented to them that they can sort of run with it while I'm working with other students." Brandon would like more help figuring out what is suitable for gifted students.

> I guess, because we've never heard from an administrator ... They want you to give additional for a gifted kid. What constitutes it being additional? Just because I'm giving [them] more challenges, does that make it really more challenging to them? I know we see the benefit of it. I guess it's more like, okay, they're identified as gifted. Just because they're gifted, does that mean they can do this topic that maybe the regular kids can't do? It becomes, then, how much time can you devote to it? I guess that's always just the frustration, just like, what constitutes it being suitable for a gifted student?

Steven commented that he would like more information on implementing "a guided math type program" with his students. Angela expressed needing help differentiating for her gifted students.

> I don't think they should just do more problems. I don't think that's the right answer, but finding a meaningful enrichment activity that's related to the topic in some way. Certainly, I think I can find some enrichment topics based on whatever, but trying to tie it in with what we're currently doing, I think I fall short

> there. I could definitely use some more training on ideas and projects and meaningful enrichment opportunities. “They’re finished, so now what can I do with them? What’s going to make the best use of their time? What’s going to really help to develop them as learners?”

Natasha stated she would like help applying her knowledge of differentiation specifically to meeting the needs of her gifted students.

> I could benefit from additional training in maybe just how to apply what I already know about differentiation to the gifted student situation and how to make things more challenging. Or just give me a list of a couple of resources that might help, point me in the right direction, that kind of thing.

Three subthemes were mentioned by six respondents each: more time or better time management techniques, a desire to avoid pushing gifted students too far, and a need for more collaboration among math teachers. With regard to pushing students too far, Kevin described struggling to decide how much work to assign to gifted students.

> Sometimes they’re very self-motivated, but again, with each student being different, we get through everything that’s needed in the class, and then that particular student… sometimes it feels to me that, “Hey, great job, here’s a reward,” and it’s more work, it’s more time to think, you know? So getting to know the students and knowing when to say, “Hey, you’ve earned a little bit of time to yourself,” and other times when it’s, “Hey, let’s push you because you’re able to learn, and let’s see what you can do.” Just finding that happy medium in

> there, because one way or the other, tip too far, it just isn't, I don't know, proper I guess.

Chad expressed a similar concern, simply stating, "And I also don't want to break the gifted students that are in my classroom."

With regard to having a need for more collaboration among math teachers, Kevin commented, "You know, I can only go so far by myself. It just seems like I would benefit from being able to talk with more people in the same area as me, I guess." William said that he would benefit from more opportunities to discuss gifted students with his colleagues.

> To be able to ask somebody down the hallway … "What did you do with this student? How did you help their GIEP and what kind of things did you do?"
>
> Whether the content is different, at least the idea of how you did it kind of helps.

Natasha also expressed a desire for increased collaboration among her colleagues.

> I would benefit from just maybe having some informal discussion from someone else. Another eighth grade or ninth grade teacher that's sharing ideas about, "Oh, this is how I challenge my gifted students" because sometimes I feel like I don't always come up with those ideas on my own, but I like to say I'm a much better editor than a writer.

Four subthemes were discussed by five participants each: a need for ways to challenge gifted students while also helping the lower students, more resources for meeting the gifted students' needs, more training and exposure to problem-based learning activities, and more training in general. Four participants expressed a desire for math-

specific gifted training. Three participants discussed needing help learning how to handle gifted students' socio-emotional needs. Three participants also commented that they need more collaboration between themselves and the school's gifted coordinator.

Teacher self-evaluations. Teacher self-efficacy is directly related to how well teachers think they are able to teach their students. During our interviews, I asked participants how well they felt they were able to meet the needs of their gifted students in their inclusive mathematics classes. Seven of the participants said they felt they were doing an average job of meeting their gifted students' needs. Sharon rated her ability to meet the needs of her gifted students in her inclusive mathematics classes as average.

> I guess I'd say kind of middle ground, because I haven't had a whole lot of training. I don't feel super, super equipped, but I feel that I have found ways to try to do it the best that I can. I don't think I'm a total failure at it, but I could definitely use more training and more experience with it. I think it's hard, too, because every year you get like one or two gifted kids. I've been teaching for nine years, but if I've only had one or two kids each year, that's not a whole lot of experience with that type of child.

Chad rated his abilities to meet the needs of his gifted students in his inclusive mathematics classes as average.

> Personally, I feel that I have the ability to meet their needs but to expand upon the content and really get to the nitty gritty of what they could do and really push them to the fullest potential, I feel like I have a lot of room for growth.

Cheryl also ranked herself as having an average ability to meet the needs of her gifted students in her inclusive mathematics classes.

> I feel I'm, I would say, like a medium or moderate level with being comfortable to instruct them. I think that comes from my background, my own personal background of experiencing gifted students and the things that I went through myself growing up as a gifted student. I feel as if sometimes I know how they think or a little bit more about their processes, but I feel if I had formal training or instruction or in services that I could be much better than I am, because I'm kind of basing all of my experiences on personal experiences versus formal training.

Angela also ranked herself as doing an average job of meeting the needs of her gifted students in her inclusive mathematics classes.

> I think I do a decent job. I definitely think there's room for improvement, but I think I'm also doing better than some are doing. I think that I, well, I recognize the need for it, which I think is the first step. And I think I'm open to trying new things, realizing that not everybody has to do everything, and if they can show me they can do it in just a couple of problems, then they don't have to do more than that.

Three of the participants felt they were doing an above average job of meeting the needs of their gifted students. Steven gave himself an above average rating when he reflected on his ability to meet the needs of his gifted students in his inclusive mathematics classes.

> I'd say it's above average. I could say I could maybe do it a little bit better, but I definitely did it better than last year. Last year I had the idea, this year I started implementing it. Yeah, so it's going about as well as I thought it was going to go.

Additionally, one teacher admitted that she felt she was not doing a very good job of meeting the needs of her gifted students. Wendy felt that this year was extra challenging in this regard.

> So this year, for the first time in a long time, I have some kids in honors that I do feel are exceptional in math. And I don't feel like I'm doing a bang up job challenging them because when I'm teaching to the group, I do have kids that I think could handle more and they're not getting that.

One teacher did not directly answer the question.

I also asked teachers to describe their greatest strengths in meeting the needs of the gifted students in their inclusive mathematics classes, as this is related to positive self-efficacy. Six participants said that their willingness and effort to differentiate for their gifted students is a strength. Sharon shared,

> I have a third grade coworker. We really tried hard, and I think I talked about this before, of making more centers during math, so that we could hit the kids really where they needed it, so that has helped not just with the gifted kids but also with the lower kids, really being able to differentiate for them. That's, I would say, the biggest strength. It's giving me more of an opportunity to give them harder challenges.

Five teachers said they considered their prior experience teaching gifted students to be a strength. Kevin said that he feels "better every year" and that his prior experience teaching gifted students enhances his feelings of confidence:

> This year I feel pretty prepared. I changed jobs last year, and when I came here expectations are always a little bit different, especially with the gifted teachers. So, I have a good idea, and a good working relationship with our gifted teacher. And we are able to work through it, and the nice thing is she's able to come into the school and pull some of the students and get some extra work with them as well, it's not just completely on me. So, that definitely does help. And just with everything that I've been putting together the past seven/eight years I do feel pretty good about it. I guess, just from experience knowing what questions might arise, especially with the gifted students. So, usually I have it planned somewhere in my lesson plans to be ready for this type of question that might take it a little bit further.

Four teachers said their mathematical content knowledge is a strength. Wendy, for example, felt that her strength is her content knowledge combined with her ability to present the material in a way that her students can easily understand.

> What I feel I'm best at, it doesn't really lend itself to the gifted student because I think I'm really good at, I always joke with my colleagues, is like dumbing down higher math. 'Cause I teach pre-calc and calc, and I really actually enjoy teaching the non AP versions of that. I'm teaching that hard level stuff but bringing it down a notch for the kids who aren't the gifted kids, if that makes sense.

Steven also said that his content knowledge is a strength. He felt that his content knowledge, along with his enjoyment of the subject, rubs off on his students and contributes to their successes.

> I would say that math is probably my strongest suit which is why I'm an enrichment teacher. None of the other teachers really wanted it. I'm able to explain it in other ways … Yeah, the content knowledge I have which really benefits me. It's also my favorite subject to teach too … I have that about me as well, so I get excited about teaching it and showing them these cool ways. That helps rub off on them as well.

Research Question 3

The third research question was: *What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?* Two themes emerged within this research question: impact of training on instructional practices and impact of training on student academic achievement. Subthemes emerged within each theme, which are described in greater detail. Table 5 lists the themes and subthemes that emerged from the third research question.

Table 5

Themes and Subthemes Within Research Question 3

Themes	Subthemes	Number
Impact of training received on instructional practices	Differentiating instruction and tasks	7
	Higher expectations for entire class	6
	Increased collaboration among students	5
	Avoids giving work for the sake of more work	3
	Formative assessment	3
	Improved pacing of instruction	3
Impact of training received on student academic achievement	Gifted students show academic growth	10
	Difficult to tell	5
	No impact	3

Impact of training received on instructional practices. Although the majority of teachers reported they had never received formal training that specifically focused on meeting the needs of gifted students, the informal training they received as well as training with regard to the broad topic of differentiation impacted teachers' instructional practices. Seven participants mentioned that they noticed an improvement in their ability to differentiate classroom instruction and tasks. For instance, Sharon commented, "the differentiated instruction training that our district sent us to, that's where a lot of my center-based instruction now came from." Brandon also attended training on differentiation, and commented, "What I've been able to do is, I make the assignments not just cookie cutter assignments." Cheryl referred to a training on differentiation as well, remarking, "Only having that brief training, I think that training affected the types of work that I may give them. As I said, not extra work, but different types of work."

Olivia spoke of how she differentiates on a daily basis as a result of training that she has received.

> We try to differentiate, so for instance, after I do an instruction to the class, how they go about completing their daily work is different based on their level. So someone who is higher may be working in a collaborative group on something, and someone who is low would be working with a teacher. So just how to differentiate different activities for the students, whether or not they go on [various computer programs]. It depends on how they're performing in the classroom. So things like that.

Natasha was open to differentiation training provided by her school district, but shared that not all of her colleagues appeared to be on board with the professional development opportunity.

> When we went through the differentiation training, you know, a lot of the math teachers kind of poo-pooed it and said, "Oh, well, this is how we always have taught just to survive. We can't just say, 'Oh, you don't know it? Too bad, let's move on.'" I felt like I learned a lot because I just felt like I was more aware of differentiation and what I really needed to do.

Six participants discussed having higher expectations for all students in their class. Brandon commented that since attending his school district's training on differentiation, "You're just not challenging the top level kids anymore, so we kind of see that." William noticed a similar outcome after attending differentiation training.

> We want to try to build the lower up, which any school would want to do. But you also want to make sure that you keep building up the higher level too … I think it just kind of opened up a little bit more and had me, again, talking about how the things that you do for one group of students isn't necessarily bad for everybody … But I think it did kind of open my eyes to say, "Well, maybe the things that I'm trying to expand on for a higher group might also pull the rest of the group up a little bit more." Not to say it's necessarily formal or informal, it's just more intuitive, I guess … Regular ed could be pulled higher, so I think it all kind of works together, even though there are GIEPs and regular IEPs, and 504 plans, and this and that to accommodate to the lower students. The accommodations for the higher students will help pull the regular ed people up.

Olivia shared this sentiment as well:

> I think the whole class is achieving very well because of working to each of their levels, not just the gifted level, but also all those other students who weren't identified as gifted. So I'm impressed with their abilities on their [Standardized Test for the Assessment of Reading] STAR tests, this year especially, and their [Pennsylvania System of School Assessment] PSSAs have been good. So I'm hopeful.

Five participants cited increased levels of collaboration among their students as a result of strategies acquired during trainings. William described what this collaboration looks like in his classroom.

> Yeah, I think I'm more like just spatially aware of who is in the room, and even pairing a gifted student maybe at a table with a bunch of students that are regular ed even though it's not directly towards their GIEP. That student knowing the content a little bit clearer and being able to explain it to the other students in their group helps pull the group members up a little bit, but it also helps their understanding: "If I really understand it this well, and I can explain it to a group of three other people, or help them with this problem," they become the teacher kind of thing, and they learn more by teaching it in their own words to somebody else. And then the regular ed students will do that with other regular ed students, and it kind of trickles … I think it just helps, because they have a very good relationship with the other people in class, at least in the classes that I have, and I think that helps with the dynamics. They can have a conversation about a problem with another person, and kind of draw in these things that I've been talking about in this interview, like these higher level things, and draw it into a conversation that isn't with me.

Olivia described her collaboration strategy as being somewhat differentiated for the needs and ability levels of her students.

> The ones that are higher are in a collaborative group … if they can handle being in a collaborative group, then they're in the collaborative group of five or six students. If I feel they've got it, but collaboration in a big group isn't for them, then they're working with partners so that it's not as much ... they just have one other person they need to worry about.

Natasha is also trying to increase the collaboration opportunities in her classroom, but she acknowledged that she still has some growing to do in this area.

> The other thing that I know our district is emphasizing is collaborative learning. I've been incorporating more collaborative learning tasks, but I'm not there yet ... Students working in groups, students working together and trying to understand a situation or understand a math concept and then, rather than me just directly teaching it to them, I have to create a situation where they will experience something and learn about it, and then we'll talk about it.

Participants also mentioned that training results in a decrease of giving work just for the sake of keeping students busy, improved formative assessment practices, and improved pacing of instruction.

Impact of training received on student academic achievement. Participants reported they had never received formal training that specifically focused on meeting the needs of gifted students; however, teachers commented that the informal training they received as well as training with regard to the broad topic of differentiation had an impact on student academic achievement. Ten participants commented that their gifted students demonstrated academic growth that may be attributed to formal or informal training the teachers received. Sharon discussed the academic growth of her students, as measured by progress monitoring data.

> Since I've changed and done the centers, we have seen just the gifted kids' growth and we do progress monitoring every month and they're showing more growth than they had in the past, because I am able to stretch them a little bit

> further. I wish I could stretch them even further … We're pushing the ones who are proficient to be advanced.

Kevin commented that he wished the strategies he now has for his students would have had been available to him in the past.

> I definitely think that impacts their growth, and we can get through more because I have more ready for them. "Hey, this student reminds me of so-and-so from the past," and they are making leaps and bounds. And I wish that I would have been able to do that three years ago.

William noted that in addition to higher test scores, he can notice a deeper understanding of concepts within his students.

> They're already at the levels that they're passing tests and they're passing the state-wide tests, and their scores are doing well, and SATs, and this or that… But I think academically, I do feel like they're understanding concepts at a higher level that they can apply it to the next chapter, or, "Oh, this is something we did in chapter ..." Without me telling them that it was in chapter whatever.

However, five of the teachers commented that it is difficult to determine the impact of training received on student achievement. Brandon commented, "That's hard to tell. It's so hard to tell whether, with all the technology and everything, whether it's the same kind of kid from ten years ago, so many things have changed." Angela tried to be optimistic but was not sure of the impact training has had on her students.

> I guess I don't know exactly how it's been impacted. I hope that it's going well and that they're growing, but I definitely wonder if that's really the case. I would

like to think that they're growing and they're making their year's worth progress, and they're growing. I definitely question it though and I wonder, "Are they getting forgotten?"

Three of the teachers commented that they felt the training they experienced likely had no impact on student academic achievement. Natasha commented that her students' exam scores did not change much so she was unsure if her training had any impact on her students' academic achievement. Cheryl felt that any training received so far has not made a big impact on student achievement. Cheryl stated, "I would say I've had so little training that I don't think it's really affected anything in any great way."

Summary

Chapter 4 opened with a discussion of the setting for this study as well as a description of the participant demographics. Next, I described the data collection and data analysis methods and discussed issues of trustworthiness. Lastly, I presented the results of the data analysis.

The first research question was: *What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?* Four themes emerged within this research question: challenging experiences, motivating or rewarding experiences, characteristics of gifted students, and building-level gifted support provided to students. The most common challenging experiences teachers reported were related to differentiating for gifted students, teaching in an inclusive classroom, and being unfamiliar with the gifted qualification process for students. The most common motivating or rewarding experiences were providing appropriate challenge

to gifted students, experiencing a gifted student persevering through a challenge, experiencing a gifted student's divergent thinking, and seeing their students succeed in mathematics or later in life. The most common characteristics of gifted students that teachers reported were students possessing a natural curiosity, students being high achieving, and students becoming easily frustrated. Participants discussed the most common building-level gifted supports provided to students: gifted specialists existing within the district, gifted students being pulled out of class to work with the school's gifted specialist, and students being placed in higher level classes in order to meet their mathematics needs.

The second research question was: *What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?* Seven themes emerged within this research question: obstacles encountered while teaching, rewards gained from teaching, ways teachers can make a difference in students' lives, formal training received that could be applied to teaching gifted students, informal training received that could be applied to teaching gifted students, teacher needs, and teacher self-evaluations. The most common obstacles encountered while teaching gifted students were differentiating for gifted students, teaching in an inclusive classroom, and being unfamiliar with the gifted qualification process for students. The most common rewards gained from teaching gifted students were providing appropriate challenge to gifted students, experiencing a gifted student's divergent thinking, and seeing a gifted student persevere through a challenge. Participants reported the most common ways that teachers can make a difference in students' lives: pushing students

farther, preparing students for college and careers, and helping develop a student's appreciation for math. Teachers described the most common formal training received that could be applied to teaching gifted students: gifted specific, differentiated instruction, and training geared toward struggling learners. Teachers discussed the most common informal training opportunities: discussions with other teachers, discussions with the school's gifted specialist, and teachers relying on their experiences as being gifted themselves. The most common teacher needs reported by participants included ways to stretch gifted students farther, gifted-specific differentiation, ways to avoid pushing gifted students too far, more collaboration between math teachers, and more time or better time management. Participants most commonly reported that their abilities to meet the needs of gifted students were average, that trying to differentiate for gifted students is a strength, and that the experience they have acquired by teaching gifted students is also a strength.

The third research question was: *What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?* Two themes emerged from the participants' responses to this research question: impact of training on instructional practices and impact of training on student academic achievement. The most common impact of training on instructional practices responses were differentiating instruction and tasks, having higher expectations for the entire class, and increased collaboration among students. The most common impact of training on student academic achievement

responses were gifted students show academic growth, the impact is difficult to notice, and no impact noticed.

Chapter 5 includes a discussion of the interpretation of the findings of this study. The chapter includes a description of the limitations of the study, followed by recommendations for further research that are grounded in the strengths and limitations of the current study. Lastly, Chapter 5 includes a discussion of the implications for positive social change, followed by a conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative, phenomenological study was to explore the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms. My goal in this study, grounded in Bandura's (1977, 1986) social cognitive theory, was to offer recommendations for improving teacher job satisfaction in relation to providing appropriate learning experiences for gifted students in inclusive settings. To accomplish that purpose, I described the factors that teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms. I also described the perceptions of teachers regarding how their professional development influences the academic achievement of these students. The research questions for this study were based on Bandura's (1977, 1986, 1997) social cognitive framework and the literature review for this study.

1. What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?
2. What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?
3. What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?

Chapter 5 includes a discussion of the interpretation of the findings of this study. I present a description of the limitations of the study, followed by recommendations for further research that are grounded in the strengths and limitations of the current study.

Lastly, Chapter 5 includes a discussion of the implications for positive social change, followed by a conclusion.

The first research question was: *What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?* Four themes emerged within this research question: challenging experiences, motivating or rewarding experiences, characteristics of gifted students, and building-level gifted support provided to students. The most common challenging experiences teachers reported were related to differentiating for gifted students, teaching in an inclusive classroom, and being unfamiliar with the gifted qualification process for students. The most common motivating or rewarding experiences were providing appropriate challenge to gifted students, experiencing a gifted student persevering through a challenge, experiencing a gifted student's divergent thinking, and seeing their students be successful in either mathematics or later in life. The most common characteristics of gifted students that teachers reported were students possessing a natural curiosity, students being high achieving, and students becoming easily frustrated. The most common building-level gifted supports provided to students were gifted specialists existing within the district, gifted students being pulled out of class to work with the school's gifted specialist, and students being placed in higher level classes in order to meet their mathematics needs.

The second research question was: *What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?* Seven themes emerged within this research question: obstacles encountered while teaching, rewards gained from teaching, ways teachers can make a difference in

students' lives, formal training received that could be applied to teaching gifted students, informal training received that could be applied to teaching gifted students, teacher needs, and teacher self-evaluations. The most common obstacles encountered while teaching gifted students were differentiating for gifted students, teaching in an inclusive classroom, and being unfamiliar with the gifted qualification process for students. The most common rewards gained from teaching gifted students were providing appropriate challenge to gifted students, experiencing a gifted student's divergent thinking, and seeing a gifted student persevere through a challenge. The most common ways that teachers can make a difference in students' lives were pushing students farther, preparing students for college and careers, and helping develop a student's appreciation for math. The most common formal training received that could be applied to teaching gifted students were none that is gifted specific, differentiated instruction, and training that is geared toward struggling learners. Participants reported the most common informal training they received included discussions with other teachers, discussions with the school's gifted specialist, and teachers relying on their experiences as being gifted themselves. The most common teacher needs identified by participants were ways to stretch gifted students farther, gifted-specific differentiation, ways to avoid pushing gifted students too far, more collaboration between math teachers, and more time or better time management. Participants self-reported their abilities to meet the needs of gifted students were average, that trying to differentiate for gifted students is a strength, and that the experience they have acquired by teaching gifted students is also a strength.

The third research question was: *What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?* Two themes emerged within this research question: impact of training on instructional practices and impact of training on student academic achievement. With regard to the impact of training received on instructional practices, teachers most frequently discussed differentiating instruction and tasks, having higher expectations for the entire class, and increased collaboration. With regard to the impact of training received on student academic achievement, teachers most frequently discussed gifted students showing academic growth, the impact being difficult to tell, and no impact noticed.

Interpretation of the Findings

This study was grounded in Bandura's (1977, 1986) social cognitive theory. Bandura (1993) suggested that teacher efficacy is linked to the academic performance of students. More specifically, Bandura (1997) believed that "the task of creating learning environments conducive to development of cognitive competencies rests heavily on the talents and self-efficacy of teachers" (p. 240). Additionally, Bandura (1997) believed that self-efficacy determines the activities, tasks, and situations that individuals are willing to attempt; people tend to avoid situations and activities they feel are beyond their control. Individuals with high self-efficacy tend to persevere when confronted with difficulties, provide sustained effort and attention in demanding situations, experience minimal stress, and set challenging goals for themselves. Conversely, people who possess low self-efficacy tend to decrease effort or even give up in difficult situations, suffer from stress

and anxiety, avoid potentially enriching activities, and avoid setting challenging goals for themselves (Bandura, 1997). Additionally, Bandura (1977) suggested that learning is explained by a relationship between three factors: a learner's behavior, the environment, and personal events. In order to view the common lived experiences of teachers who provide mathematics instruction to gifted students in inclusive classrooms through the conceptual lens of Bandura's social cognitive theory, I developed research questions that would elicit teacher responses revealing factors that could impact their self-efficacy.

Current Literature and Conceptual Framework for Research Question 1

The first research question was: *What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?* Four themes emerged within this research question: challenging experiences, motivating or rewarding experiences, characteristics of gifted students, and building-level gifted support provided to students. Other responses emerged as well but were not frequent enough to qualify as subthemes.

Teacher preparation programs. Current literature reveals that teacher preparation programs often provide insufficient training to meet the needs of gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). This inadequate preparation is especially evident in inclusive classrooms where teachers are responsible for delivering instruction to students with a wide range of academic abilities and social needs (Alderton & Gifford, 2018; Everett, 2017; Faragher et al., 2017; Kurth & Forber-Pratt, 2017; Rubenstein et al., 2015; Sheehey et al., 2017; Van Ingen et al., 2016). Bandura (1997) found that a person's perception about a situation can

be a leading factor in determining how that person will respond to that situation. As a result, teachers' thoughts about their ability to meet the needs of gifted students in their classes may be a powerful predictor of student success. The amount and type of training that teachers receive with regarding to meeting the needs of their gifted students can strongly influence their self-efficacy levels and is highly relevant to this study.

This study's findings support the current literature. All participants reported feeling they did not receive adequate gifted-specific training during their teacher preparation programs in college or as part of their school district sponsored professional development opportunities. The one teacher who enrolled in professional development specifically for teachers of gifted students in inclusive classrooms sought out the class on her own because she was passionate about the subject. Participants reported that most of the guidance they received with respect to teaching gifted students in their inclusive mathematics classrooms was obtained through informal discussions with their school's gifted specialist, through discussions with other teachers, through their own experiences of being identified as gifted, or through internet searches.

Characteristics of gifted students. Current literature reveals that teachers often find meeting the unique needs of gifted learners to be challenging, especially because gifted students do not make up a homogeneous group and have a wide variety of social and academic needs (Bakar et al., 2013; Horne & Shaughnessy, 2013; Ishak et al., 2013; Kerr & McKay, 2013; Morris, 2013; Tay et al., 2018; Yurt & Kurnaz, 2015). Perhaps due in part to the absence of a singular definition of giftedness, gifted learners represent a diverse cross-section of the population (Bakar et al., 2013; Kerr & McKay, 2013; Yurt &

Kurnaz, 2015). As a result, they cannot be stereotyped into one generalized description. The literature review, however, revealed a number of academic and social characteristics that appear to be prevalent among gifted students. With regard to academia, gifted learners thrive in open-ended learning environments that nurture and challenge their creativity (Angelova, 2014; Horne & Shaughnessy, 2013; Kaplan & Hertzog, 2016; Mullet et al., 2018). Gifted learners tend to self-regulate more efficiently and possess higher levels of motivation than other students (Luftenegger et al., 2015; Morris, 2013), and as a result, learn faster than other students and can benefit from individualized pacing, breadth, and learning objectives (Morris, 2013; Tortop, 2014).

Current literature also suggests that with regard to social characteristics, gifted students have strong perceptions of self-efficacy (Morris, 2013; Nilgun & Ayca, 2016). Gifted students also display a great degree of empathy, which is said to be highly correlated with strong leadership (Bakar et al., 2013; Morris, 2013). Gifted students possess personality traits that could have a negative effect on their educational and psychological development such as perfectionism and competitiveness (Bakar et al., 2013).

Gifted students also report feeling unchallenged at school. In four separate investigations, gifted students reported feeling bored in school and expressed that teachers in their schools do not adequately challenge them or value them as learners, especially at the secondary level and in inclusive regular education classrooms (Bayok et al., 2013; Morris, 2013; Mullet et al., 2018; Ozdemir, 2018). Additionally, gifted students can be limited by a small number of academically appropriate course offerings available,

especially in mathematics (Mullet et al., 2018). When gifted students are appropriately supported in school, they can excel in certain areas by an additional 20–25% (Trna & Trnova, 2015). When gifted students with an interest in STEM-related areas are appropriately supported, there is an improved chance that they will persist through college and earn an undergraduate STEM degree (Almarode et al., 2014). Parental support is critical to the success of gifted students (Horne & Shaughnessy, 2013; Morris, 2013). Mathematically gifted students need mathematics teachers who possess a strong formal education in mathematics, especially at the secondary level (Karsenty, 2014). Even though gifted students have a diverse set of characteristics, an understanding of some of their similar traits may help educators improve their abilities to meet their academic and social needs. Smith and Campbell (2016) suggested that teachers' opinions about giftedness shape their perception of their students' abilities and determine how teachers group students for different learning tasks.

This study's findings support the current literature on the characteristics of gifted students. The traits most commonly chosen by participants to describe gifted students including possessing a natural curiosity, being high achieving, and becoming easily frustrated; however, outside of those qualities, the descriptions varied greatly. A number of the teachers reported having difficulty describing the predominant traits of gifted students because, in their experiences, each gifted student is very different.

Gifted identification and support systems. Foreman and Gubbins (2015) suggested that nonexamination methods for identifying gifted students should be implemented because not all gifted students demonstrate their abilities through traditional

testing methods. This study's findings support that claim in a number of ways. First, several of the teachers reported being surprised that some of their students did not meet the gifted criteria after being tested by the school district; as their teachers, participants felt that the students were very likely gifted. The findings revealed another need for gifted identification reform because several of the teachers shared experiences of gifted students struggling who moved into the school district after being identified as gifted at their former school district. Participants in the study appeared to be frustrated over the lack of consistency and transparency in the gifted identification process for their students.

Teaching in inclusive classrooms. Current literature reveals that teachers in inclusive classrooms are expected to meet an increasingly diverse and challenging set of student needs (Alderton & Gifford, 2018; Everett, 2017; Faragher et al., 2017; Kurth & Forber-Pratt, 2017; Rubenstein et al., 2015; Sheehey et al., 2017; Van Ingen et al., 2016). Teachers may receive only "modest support for including children with special needs in inclusive classrooms" (Lee et al., 2015, p. 85). Therefore, a need exists to better understand and support the needs of teachers who educate children in inclusive classrooms. The literature review revealed a greater number of interventions currently in place to meet the needs of struggling learners in inclusive classrooms as compared to those that meet the needs of gifted students in inclusive classrooms (Alderton & Gifford, 2018; Bottge et al., 2018; Choi et al., 2017; Ellingsen & Clinton, 2017; Faragher & Clarke, 2016; Faragher et al., 2017; Ibrahim et al., 2017; Jitendra et al., 2018; Micanovic et al., 2017; Monei & Pedro, 2017; Schmidt, 2016; Sheehey et al., 2017; Soorenian, 2018; Van Ingen et al., 2016; Weiland, 2016). Additionally, educational approaches that

meet the creative needs of gifted students were demonstrated by Flint (2014) to benefit all types of learners.

Teacher attitudes and opinions about the practice of inclusion also emerged from the current research. Smith and Campbell (2016) found that teachers' attitudes toward inclusion are influenced by a number of factors including teacher training, the types of special needs that are present in the classroom, teacher knowledge of special needs, teacher experience in educating children with special needs, and the professional role of the teacher. Additionally, three themes emerged from a study by Kurth and Forber-Pratt (2017) on teachers' views of inclusive education. First, teachers reported feeling doubtful about the ability of schools to adequately meet the diverse needs of students with disabilities in inclusive classrooms (Kurth & Forber-Pratt, 2017). Second, teachers reported being generally supportive of the idea of inclusion, but many felt that they lacked the training, resources, and time to properly implement effective inclusive strategies. Third, teachers expressed a concern about the possible impact of the practice of inclusion on students without disabilities, because of classroom disruptions and a slower pace of instruction. Kurth and Forber-Pratt noted that contrary to teacher concerns, researchers strongly suggest that inclusion has a positive, or at worst neutral, impact on students without disabilities, which may be linked to quality implementation of inclusion, accessible curriculum, and the availability of other schoolwide services and supports.

This study's findings support the current research. First, teachers reported that most of the professional development opportunities they experienced with regard to

differentiating for students were geared toward struggling students. As a result, meeting the needs of gifted students was rarely, if ever, mentioned at those workshops. The top two obstacles encountered while teaching gifted students in inclusive mathematics classrooms were differentiating for their gifted students and meeting the diverse student needs in an inclusive classroom. Other obstacles that teachers encountered while teaching in an inclusive classroom included wishing they could provide all students with enrichment opportunities instead of just the gifted students, and feeling that the non-gifted students often become jealous of the gifted students because of the special treatment they receive. Several teachers also cited struggling to meet the needs of their twice-exceptional students, or those who have been identified as being both gifted and in need of learning support.

Current Literature and Conceptual Framework for Research Question 2

The second research question was: *What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?* Seven themes emerged within this research question: obstacles encountered while teaching, rewards gained from teaching, ways teachers can make a difference in students' lives, formal training received that could be applied to teaching gifted students, informal training received that could be applied to teaching gifted students, teacher needs, and teacher self-evaluations. Several of the themes also emerged in the literature reviewed in Chapter 2. Additionally, teachers' feelings about their abilities to meet their gifted students' needs, as well as challenges and rewards they have experienced while

teaching gifted students in inclusive mathematics classrooms, impact teacher self-efficacy.

Teacher self-evaluations. Current research revealed that teachers may not know how to provide appropriately challenging educational experiences for gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). Additionally, teacher efficacy has been found to influence teachers' thoughts and feelings, the amount of effort teachers put into teaching, the selection of instructional activities used by teachers, and the level of persistence teachers exhibit when they are confronted with obstacles (Chang, 2015). High levels of teacher self-efficacy contribute to efficient classrooms, quality instruction, student motivation, improved student achievement, and positive school climate (Carney et al., 2016; Gerde et al., 2018; Horne & Shaughnessy, 2013; Karakus et al., 2018; Katz & Stupel, 2016; Lazarides et al., 2018; Miller et al., 2017). Teacher self-efficacy affects the teacher's instructional approaches as well as student academic gains (Carney et al., 2016; Katz & Stupel, 2016). Katz and Stupel (2016) reported that teachers with high levels of teaching self-efficacy were more likely than teachers with low levels of teaching self-efficacy to expend effort in planning, instructing, organizing, goal setting, and in exhibiting flexibility. Teachers with greater teaching self-efficacy were also more likely than teachers with less self-efficacy to take instructional risks in the classroom (Katz & Stupel, 2016).

This study's findings support the current research. Seven of the teachers participating in this study felt they were doing an average job of meeting the needs of the gifted students in their inclusive mathematics classrooms. Additionally, three teachers

said they felt their ability to meet the gifted students' needs in their inclusive mathematics classroom was above average. It should be noted that due to the voluntary nature of this study and the non-anonymous nature of the questioning, the teachers' self-ratings may have been higher than they would have been had their identities been shielded from the researcher. The most common strengths that participants mentioned were having a desire to differentiate for their students, gaining experience teaching gifted students each year, and possessing a good level of content knowledge. Most of the teachers expressed that they could probably do a better job of meeting their students' needs, and would participate in gifted-specific training opportunities if they were available.

Need for training. The value of teacher preparation programs is debated in recent research (Goldhaber et al., 2013). Some findings suggest that teacher training does not have a marked effect on teacher attitudes or behaviors (Lee et al., 2015; Rubenstein, 2013; Shahbari, 2018); however, the majority of researchers suggested that teacher preparation programs have a positive impact on teacher performance (Griffin et al., 2018; Handal et al., 2015; Katz & Stupel, 2016; Leavy & Hourigan, 2018; Levi-Keren & Patkin, 2016; Shuilleabhain & Seery, 2018; Tortop, 2014). Teacher preparation programs often provide insufficient training to meet the needs of gifted students (Flint, 2014; Kurth & Forber-Pratt, 2017; Trna & Trnova, 2015; Van Ingen et al., 2016). This inadequate preparation is especially true in inclusive classrooms where teachers are responsible for delivering instruction to students with a wide range of academic abilities and social needs (Alderton & Gifford, 2018; Everett, 2017; Faragher et al., 2017; Kurth & Forber-Pratt, 2017; Sheehey et al., 2017; Van Ingen et al., 2016). In addition, teachers may not know

how to provide appropriately challenging educational experiences for gifted students (Flint, 2014; Morris, 2013). A study by Rubenstein et al. (2015) on teachers' reactions to pre-differentiated and enriched mathematics curricula demonstrated that teachers are willing to differentiate to meet the needs of the students in their classes when they are provided with the appropriate training and resources. When teachers receive appropriate training that includes mastery experiences and develops teachers' physiological and emotional states, their teaching self-efficacy is improved, which leads to gains in students' achievements and on school climate (Chang, 2015). Effective teacher training has been shown not only to improve teachers' content knowledge, but also to increase educators' teaching efficacy (Griffin et al., 2018; Katz & Stupel, 2016; Leavy & Hourigan, 2018; Levi-Keren & Patkin, 2016; Tortop, 2014). Finally, current research revealed that teachers want to incorporate more creativity and STEM instruction into their curriculum, but feel they do not have enough time, training, or knowledge required to do so (Dailey, Cotabish et al., 2018; Flint, 2014).

This study's findings support the current research. The majority of study participants wanted training on how to stretch their gifted students farther without pushing them too far. Additionally, teachers mentioned needing training on gifted-specific differentiation while also meeting the needs of their struggling students. Teachers also discussed the need for time management strategies, gifted-specific teaching resources, exposure to problem-based learning activities, math-specific training, and strategies for handling gifted students' socio-emotional needs.

Need for collaboration. Current literature reveals that there is a need for collaboration among teachers, counselors, and administrators to provide appropriate social guidance and supports (Horne & Shaughnessy, 2013; Ishak et al., 2013). Teachers can become more effective when they are given opportunities to share ideas with other colleagues, including mentor teachers (Blank, 2013; Dailey, Jackson, Cotabish, & Trumble, 2018; Kurth & Forber-Pratt, 2017; Lloyd, 2018; Ong et al., 2016; Rubenstein, 2013). Dumay et al. (2013) suggested that teacher collaboration and the collective efficacy that results from it have a greater impact on mathematics teacher growth than the impact of principal leadership qualities.

This study's findings support the current research. Many of the participants wanted greater collaboration among fellow mathematics teachers so that they could share resources and strategies. A few of the participants mentioned wanting more collaboration between themselves and the school's gifted coordinator; participants hoped to better understand their gifted students' strengths and needs, and the gifted identification process in general.

Current Literature and Conceptual Framework for Research Question 3

The third research question was: *What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?* Two themes emerged within this research question: impact of training received on instructional practices and impact of training received on student academic achievement. Teacher opinions about the effectiveness of

their training and preparation with regard to meeting the needs of their gifted students can strongly influence their self-efficacy in this area.

Impact of training. Current literature reveals that when teachers receive appropriate training that includes mastery experiences and develops teachers' physiological and emotional states, their teaching self-efficacy is improved, which leads to gains in students' achievements and on school climate (Chang, 2015). Effective teacher training has been shown not only to improve teachers' content knowledge, but also to increase educators' teaching efficacy (Griffin et al., 2018; Katz & Stupel, 2016; Leavy & Hourigan, 2018; Levi-Keren & Patkin, 2016; Tortop, 2014).

This study's findings support the current research. Even though the participants reported they received little to no formal training with regard to teaching gifted students in inclusive mathematics classes, they did report that related training had an impact on their instructional practices and their student achievement. Teachers commented that training they received with regard to differentiating instruction, as well as informal discussions with colleagues and information they sought out on their own, resulted in growth in areas such as their ability to differentiate instruction and tasks, higher expectations for the entire class, and increased collaboration among teachers. Teachers also mentioned a decrease in tendencies to assign work just for the sake of assigning work, increased use of formative assessments, and improved pacing of instruction. When teachers reflected on the impact of training they received on student academic achievement, they commented that many of their gifted students show academic growth, but also felt that the actual impact on academic achievement is difficult to know for sure.

Several teachers commented that they felt the limited training they have received has had no impact on student achievement.

Limitations of the Study

Limitations of a qualitative study are often related to the design or methodological weaknesses inherent to the study. This study had several potential limitations. The first possible limitation was the potential for researcher bias. As the sole researcher, I was responsible for all data collection and analysis, which could result in biased findings. I used strategies to improve the trustworthiness of this qualitative study, such as reflexivity (see Merriam, 2009). Chapter 3 included a more detailed description of these strategies.

The second possible limitation was related to the sample size. Because of time and resource constraints, qualitative phenomenological studies typically call for a small number of interviews. The sample size of 12 participants from schools in close proximity to each other could limit the transferability of the findings, because participants may share common lived experiences with few differences. A small sample size can also limit the diversity of the sample with respect to teacher gender, race, age, and years of teaching experience. I attempted to create as diverse a sample as possible from the potential participants I was able to recruit. My sample was diverse with respect to teacher gender, grade level taught, and years of teaching experience. However, diversity may be lacking with respect to the location where teacher preparation occurred. Although the participants attended a number of different universities while earning their undergraduate and graduate degrees, all of the universities were located in Pennsylvania.

The third possible limitation is related to data collection. Conducting only one initial interview and one follow-up interview with each participant may have posed a limitation. With only two interviews for each participant, it is possible that the findings may not fully address the research problem. More meaningful data might be collected if additional interviews and longer interviewing time were possible. In addition, gathering data through interviews may influence some of the participant responses to particular questions. For instance, with regard to teachers evaluating their abilities to meet the needs of their gifted students in inclusive mathematics classrooms, I feel that the teacher responses may be higher than the general population for a few reasons. First, teachers were put on the spot by being asked to evaluate themselves in an interview scenario, rather than an anonymous survey. In addition, teachers who agreed to participate in this study may be more passionate about gifted education or feel that they are doing a better job than other teachers who did not agree to participate. In order to address these limitations and ensure the accuracy of the interview data, member checks occurred after the initial and follow-up interviews were transcribed and analyzed. This process was described in greater detail in Chapter 3.

A fourth possible limitation is related to the timeframe in which the study was conducted. Data collection took place over a short period of time, which had the potential to constrict the results. If a longer data collection timeframe were possible, teacher interviews might reveal a greater diversity in responses, specifically with regard to questions dealing with experiences of teaching gifted students in inclusive mathematics classrooms. The more time a teacher engages with students, the greater number of

experiences can be reported. To address this limitation, I gave participants an opportunity to record additional thoughts that occurred between interviewing periods through the process of memoing.

Recommendations

In the literature review, the authors of recent studies revealed a number of gaps related to the teaching and learning of students in inclusive mathematics classrooms. Chang (2015) suggested that there is a need for research exploring the relationship between teacher self-efficacy and students' self-efficacy, specifically in the domain of learning mathematics and at the middle school level, as that is a crucial self-efficacy developmental period for adolescents. Additionally, there appears to be a gap in research seeking to determine whether heterogeneous or homogeneous grouping is most effective for gifted students with regard to mathematics instruction (Fruth & Woods, 2015). A study by Tay et al. (2018) revealed a gap in research focusing on the unique needs of gifted pre-kindergarten and kindergarten students, especially in the area of STEM education. Research by Andersen and Cross (2014) revealed a need to better understand the motivation of gifted students in order to better develop their talents. This study was not intended to address these gaps, and further research is needed to better understand these issues facing gifted education.

Prior to this study, a gap in current research existed concerning teacher beliefs about providing instruction for gifted students in inclusive classrooms, particularly in relation to mathematics (see Celik et al., 2018). Additionally, the majority of scholarly articles obtained during this literature review were either quantitative studies or syntheses

of literature or programs, revealing a gap in qualitative studies related to gifted education (see Morris, 2013). Outside of this study, few researchers sought to gain the opinions and perceptions of the teachers themselves (see Handal et al., 2015; Ihrig et al., 2018; Kurth & Forber-Pratt, 2017; Li, Liu et al., 2018; Miller et al., 2017; Tofel-Grehl & Callahan, 2017). The current literature revealed a gap that exists specifically related to teaching gifted students that result in recommendations for the teachers of those students, which this study sought to address. In this study, I aimed to fill some of that gap; however, due to the small sample size and limited geographic area that is represented by the sample, I recommend that additional qualitative studies be carried out in different regions of the United States. The findings of this study suggest that adequate gifted training for teachers is lacking in Pennsylvania colleges, universities, and school districts. However, more research is needed to determine if this phenomenon exists in other states as well.

Implications

The significance of a study is determined in relation to advancing knowledge in the field, to improving practice, and to contributing to positive social change. In relation to advancing knowledge, this qualitative study may provide a deeper understanding of teacher beliefs about providing instruction in inclusive mathematics classrooms for students identified as gifted in mathematics. In terms of improving practice, this study may be used to improve teacher preparation programs, particularly related to mathematics instruction for gifted students. In relation to positive social change, this study has the potential to help educators improve teacher job satisfaction in relation to mathematics instruction for gifted students who may make significant contributions to the field of

mathematics that benefit society. The mathematics learning of gifted students in inclusive classrooms may also be strengthened by the findings of this study if teachers believe they are capable of meeting the learning needs of mathematically gifted students.

A better understanding of current strengths and needs of gifted education practices can contribute to more effective and fair teacher evaluation policies. When teachers receive appropriate training for working with gifted students, they can experience an increase in teaching self-efficacy which, in turn, has a positive influence on their students' achievements and on school climate (Chang, 2015). With teacher efficacy playing a large role in determining student success, it is important to improve teacher training for providing supports for gifted students. As the research described here has demonstrated, if teachers are better prepared to meet the needs of their students, including gifted students, student motivation and performance can increase, teacher effectiveness and job satisfaction can increase, and the entire school climate can be improved.

Recommendations for Practice

Current research suggests that some current educational practices hinder the success of gifted students and should be reconsidered, namely: (a) teaching with one singular scope and sequence for all students in a course, (b) relying on a singular curriculum or instructional approach, (c) relying on rote and drill instructional methods when working with diverse students, and (d) identifying gifted students through the use of measuring instruments (Horne & Shaughnessy, 2013; Kaplan & Hertzog, 2016). I am posing additional recommendations as a result of data obtained while interviewing teachers for this study. These suggestions include utilizing a common gifted identification

process, providing gifted-specific training opportunities for educators, promoting collaboration among educators of gifted students, providing opportunities for teachers to reflect on the impact of their instructional practices on gifted students, and creating libraries of math-specific gifted resources at each school site.

Common gifted identification process. This study reinforced the need for a common procedure for identifying gifted students. I posit that one procedure that could be followed is Renzulli's (2005) proposal for identifying gifted students, since Renzulli's work was referenced by several recent studies on giftedness that appeared in the literature review (see Almarode et al., 2014; Andersen & Cross, 2014; Foreman & Gubbins, 2015; Heilbronner, 2013; Horne & Shaughnessy, 2013; Morris, 2013; Ozdemir, 2018; Rothenbusch et al., 2018; Smith & Campbell, 2016; Sternberg, 2018; Swanson & Lord, 2013; Tay et al., 2018; Tofel-Grehl & Callahan, 2017; Trna & Trnova, 2015; Wilson, 2018). Experts have estimated that 3–10% of the population is gifted (McGowan et al., 2016; Trna & Trnova, 2015). With the appropriate support, gifted students have the potential to improve their academic success up to 20–25% (Freeman, as cited in Trna & Trnova, 2015). As a result, states are under increased pressure to identify gifted students early in the students' schooling (Kaplan & Hertzog, 2016; Swanson & Lord, 2013). A common procedure for identifying gifted students, especially one that does not rely solely upon testing data, could increase the number of gifted students identified and supported.

Gifted-specific training at the college, university, and school district levels. The current literature and the data collected during this study suggest there is a great need for gifted-specific teacher training. Training should be offered during teacher education

courses in undergraduate school, as specialized courses in graduate school, and as professional development opportunities once teachers are employed at school districts. In order to better prepare teachers for meeting the needs of their gifted students in inclusive mathematics classrooms, training should be math-specific and should address a number of teacher needs. These needs include resources and strategies for differentiating for gifted students without pushing them too far, strategies for improving time management, how to challenge gifted students while also meeting the needs of struggling students, exposure to problem-based learning activities, and training on meeting the socio-emotional needs of gifted students. In order to help gifted education professionals meet the needs of gifted and talented students, the National Association for Gifted Children (2013) has developed Teacher Preparation Standards in Gifted and Talented Education for the following areas: (a) learner development and individual learning differences, (b) learning environments, (c) curricular content knowledge, (d) assessment, (e) instructional planning and strategies, (f) professional learning and ethical practice, and (g) collaboration (see Appendix H).

Collaboration among educators of gifted students. Current literature, in combination with data obtained during this study, revealed that teachers want more time to collaborate with colleagues. The teachers interviewed revealed a desire for greater collaboration with math teachers, both at the same grade level and at levels above and below theirs. Teachers also expressed a desire for greater collaboration with the school's gifted specialist. This time could be built into the professional development schedule and would allow more opportunities for teachers to share gifted-specific teaching strategies

and resources. Teachers could also have discussions that enable them to solve problems related to educating their gifted students, and better understand the gifted identification process of students at their school.

Opportunities for teachers to reflect on the impact of their instruction on gifted students. Teacher self-efficacy can increase if teachers take time to reflect on strategies and resources they are using that are having positive impacts on their students. There is greater likelihood of this reflection occurring if opportunities are offered during the work day instead of expecting teachers to engage in this practice on their own time. During this study, several teachers sought out additional information about their students and made an increased attempt to differentiate for their gifted students between the times that the initial and follow-up interviews took place. This demonstrates that teachers spent time reflecting on their instructional practices, which resulted in taking action to improve.

Library of math-specific gifted resources for teachers at the building and/or district level. A number of teachers in this study expressed having a need for more resources to help them meet the needs of their gifted students. One way that schools can meet this need is by maintaining a physical or online library that is accessible by all teachers. The library should include strategies for meeting the academic and socio-emotional needs of gifted students, as well as content-specific tasks for different grades and content levels.

Conclusion

Teachers are the most important school-related factor that contributes to student success (Council for Exceptional Children, 2013; Ekstam et al., 2017; Shaunessy-Dedrick

& Cotabish, 2014). While intelligence levels contribute to student achievement in mathematics, teacher motivation and learning strategies are shown to have the greatest impact on long-term student growth (Murayama et al., 2013). Students respond best to teachers who are enthusiastic and who appear to be knowledgeable in their subject matter (Bages et al., 2016; Lazarides et al., 2018; Sarac & Aslan-Tutak, 2017). In addition to possessing a deep understanding of the subject matter they teach, effective teachers must also possess an understanding of the most effective strategies, or pedagogy, for delivering their content to their students (Blank, 2013). Lazarides et al. (2018) suggested that "teachers who are enthusiastic and who report high self-efficacy often have highly motivated students" (p. 1). Effective teachers appear to be those who are able to create and maintain engaging learning environments for their students (Lopez-Agudo & Marcenaro-Gutierrez, 2017). Teachers must be able to create and maintain suitable learning environments (Lopez-Agudo & Marcenaro-Gutierrez, 2017); this skill is especially critical for teachers who educate students gifted in STEM disciplines (Trna & Trnova, 2015). A number of teaching strategies have proven to be especially effective for mathematically gifted students. One effective strategy is to provide students with regular opportunities to engage in real-life, open-ended, problem solving exercises, or problem-based learning (Alterator et al., 2018; Brisson et al., 2017; Flint, 2014; Mathews, 2017; Merritt et al., 2017; Mun & Hertzog, 2018). Problem-based learning opportunities have been shown to increase student academic achievement in a number of ways including improved knowledge retention, greater conceptual understanding, and improved attitudes about learning (Merritt et al., 2017). A number of other strategies are employed by

effective teachers including differentiation (Dijkstra et al., 2017; Sad et al., 2017), incorporating math-related literature in the classroom (McAndrew et al., 2017), using instructional games (Mun & Hertzog, 2018; Turgut & Temur, 2017); engaging students in cooperative learning activities (Master et al., 2017; Mun & Hertzog, 2018; Sad et al., 2017), promoting a mastery-oriented classroom (Lazarides et al., 2018), and providing students with opportunities to practice metacognition (Mathews, 2017). Finally, effective teachers of gifted students tend to take advantage of opportunities to collaborate with other teachers (Sad et al., 2017). Although researchers have revealed some qualities of teachers who effectively meet the needs of mathematically gifted students, Karsenty (2014) recommended that additional research is still needed in this area.

Teachers can become more effective when they are given opportunities to share ideas with other colleagues including mentor teachers (Blank, 2013; Dailey, Jackson, Cotabish, & Trumble, 2018; Kurth & Forber-Pratt, 2017; Lloyd, 2018; Ong et al., 2016; Rubenstein, 2013). Additionally, Dumay et al. (2013) suggested that teacher collaboration and the resulting collective efficacy have a greater impact on mathematics teacher growth than the impact of principal leadership qualities. Shuilleabhain and Seery (2018) reported that teachers may benefit from professional learning experiences that include lesson study. Teachers also appear to benefit from opportunities to become interested in the content they are teaching (Dierks et al., 2014; Ekstam et al., 2017). Teacher education programs should also foster reflective practices in teachers in addition to developing pedagogical skills (Looney et al., 2017). It is important to develop quality

teacher preparation programs because educators tend to mimic their own learning experiences in their classrooms (DeFraine et al., 2014).

Given the positive correlation between teachers and student success, current teacher preparation practices should be evaluated and revised, especially with regard to meeting the needs of gifted students in inclusive mathematics classrooms. The recommendations that emerged from this study can be used to improve teacher preparedness for meeting the unique and diverse needs of gifted students in their inclusive mathematics classrooms. Effective teacher training programs can result in improved teacher efficacy, leading to increased teacher job satisfaction. If teachers believe they are capable of meeting the learning needs of mathematically gifted students, those students have increased potential to make significant contributions to the field of mathematics that benefit society.

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Appendix A: Superintendent Invitation to Participate

Dear **(insert name)**,

I am a doctoral student at Walden University. As part of my dissertation requirement, I am carrying out a study whose purpose is to understand the lived experiences of teachers who provide instruction for identified gifted students in inclusive mathematics classrooms. I hope that this study will enable me to suggest ways that teacher training programs can better support teachers of identified gifted students. I am excited to complete the last phase of my project, and to share the results with all districts that agree to partner with me.

I am attaching my approved proposal to this email for your review.

The project will involve interviewing teachers from one or more school districts about their experiences providing instruction to gifted students in inclusive mathematics classrooms. I anticipate that I will be conducting my interviews in November and December of this year. The interview questions I plan to ask are listed in Appendix E of my proposal. I would need permission from you to approach teachers employed at **(insert name of school district)** to ask them if they would like to participate in this piece of research. I am looking to recruit 8-12 teachers to participate in this study, with a target of 3-4 teachers from each of the three grade level strands (elementary, middle, and high school). Their participation would include consenting to one 60-90 minute initial interview and one 30-45 minute follow-up interview, as well as taking time to confirm the accuracy of my interpretation of their interview data via email. The interviews will take place either in-person, via web-conference, or via telephone, outside of regular school hours. Confidentiality of school district, school site, and teachers will be maintained throughout the study. If multiple school districts agree to participate in my study, I anticipate only needing to interview 3-5 teachers from each individual school district.

If you consent to having me recruit participants from **(insert name of school district)** once I obtain IRB approval, please complete and return the attached **Letter of Cooperation** form via mail or email. You can also create your own letter of cooperation if you prefer. Electronic signatures are acceptable.

Please contact me via email or via phone if you have any questions or need additional information. I am looking forward to starting my interviews, and offering suggestions that have the potential to improve teacher efficacy and mathematics education.

Thank you in advance for your consideration.

Best regards,
Carrie L. Kizuka

Appendix B: Superintendent Letter of Cooperation

Dissertation Research Letter of Cooperation - Superintendent

(Insert name of school district)

(Insert address)

(Insert date)

Dear Carrie L. Kizuka,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Teacher Beliefs about Providing Instruction for Gifted Students in Inclusive Mathematics Classrooms within the **(Insert name of school district)**. As part of this study, I authorize you recruit teachers employed at **(insert name of school district)** via email, to conduct one 60-90 minute initial interview and one 30-45 minute follow-up interview with each teacher who agrees to participate, and to ask the participating teachers to confirm the accuracy of the interpretation of their interview data via email. The interviews will take place either in-person, via web-conference, or via telephone, outside of regular school hours. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: providing access to our teachers for study recruitment, and possibly allowing interviews to take place at the teachers' school sites, outside of instructional hours. We reserve the right to withdraw from the study at any time if our circumstances change.

I understand that the student will not be naming our organization in the doctoral project report that is published in Proquest.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,
(Superintendent Name)
(Contact Information)

Appendix C: Teacher Invitation to Participate

Dear **(insert name)**,

I am a doctoral student at Walden University. As part of my dissertation requirement, I am carrying out a study whose purpose is to understand the lived experiences of teachers who provide instruction for identified gifted students in inclusive mathematics classrooms. I have received approval from the **(insert name of school district)** administration to invite you to participate in my doctoral study entitled Teacher Beliefs about Providing Instruction for Gifted Students in Inclusive Mathematics Classrooms. I hope that this study will enable me to suggest ways that teacher training programs and school districts can better support teachers of identified gifted students. I am excited to complete the last phase of my project, and to share the results with all teachers who agree to partner with me.

To learn more about my project, please view the attached **Dissertation Research Consent Form**. If you agree to participate, I ask that you sign and return the **Dissertation Research Consent Form** to me via mail (student address) or email (student email). Electronic signatures are acceptable. Please contact me via email or via phone (student phone number) if you have any questions or need additional information. I am looking forward to starting my interviews and obtaining information that has the potential to improve teacher efficacy and mathematics education.

Thank you in advance for your consideration.

Best regards,
Carrie L. Kizuka

Appendix D: Draft of Interview Protocol and Questions (Before Vetting by Experts)

Interview Protocol:

- Welcome and introductions
- Verbally restate the information in the informed consent form
- Explain the taping procedure, transcribing procedure (transcriptionist), and reviewing of data (by myself)
- Restate the purpose of the study
- Opening prompts:

    1. How many years of teaching experience do you have?
    2. What grade level and subjects do you currently teach?
    3. What other grade levels and subjects have you taught?
    4. Have you ever been identified as gifted?
    5. How many identified gifted students are you currently working with on mathematics instruction in inclusive classrooms?
    6. How many of the students you are currently working with on mathematics instruction in inclusive classrooms are identified as being gifted specifically in mathematics?

- Follow the interview topics below, using probing questions as needed.

Research Question	Interview Questions
RQ1: What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?	• Please describe an experience working with a gifted student on mathematics instruction in an inclusive classroom. • Please share a second experience working with a gifted student on mathematics instruction in an inclusive classroom. • Are there any additional experiences you would like to share with regard to working with a gifted student on mathematics instruction in an inclusive classroom?
RQ2: What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?	• Please describe the characteristics of gifted students as you understand them. • What obstacles, if any, do you encounter with regard to working with gifted students on mathematics instruction in an inclusive classroom? • What has been the most rewarding part of your job with regard to working with gifted students on mathematics instruction in an inclusive classroom? • Do you feel that you can make a difference in the lives of gifted students in your inclusive mathematics classes?
RQ3: What are the perceptions of teachers regarding how their professional	• What formal training have you received that has prepared you to work with gifted students on mathematics instruction in an inclusive classroom? • Please describe any informal experiences that have prepared you to work with gifted students on mathematics instruction in an inclusive classroom. • Are there any areas with regard to working with gifted students in inclusive classrooms where you feel you could benefit from additional training? • Please share your opinions regarding how the formal and informal training you have received with regard to working with gifted students on mathematics instruction in an inclusive classroom has impacted your

development influences the academic achievement of gifted students in inclusive mathematics classrooms?	instructional practices. • How do you feel the formal and informal training you have received with regard to working with gifted students on mathematics instruction in an inclusive classroom has impacted the academic achievement of your gifted students in inclusive mathematics classrooms?

Possible Probes:

- What was the experience like?
- Would you tell me when you experienced this? How did it feel?
- I want to be sure that I understand what you are saying. Do you mean …?
- Is there anything else you would like to add about your experience working with gifted students on mathematics instruction in an inclusive classroom?

Feedback received from five education experts during the vetting process:

1st expert: Dr. T.R.: EdD in Educational Leadership, MA in Counselor Education, BA in Communication Studies; successfully defended a qualitative phenomenological dissertation; works as a dissertation coach; 20 years of experience teaching secondary education

> "You ask the participants to, "please share an experience.."
> Seems too broad, although I see the attempt to craft an open ended question
> Consider adding for specificity please share a challenging, motivating or inspirational (choose whatever word works best with your research questions!
>
> The Do you feel ... question seems like you would elicit a yes or no answer
> Consider revising
>
> The Are there areas question could be changed to discuss, identify or share the specific areas that ....
>
> The final How do you feel ... question seems a bit wordy, sometimes it helps to read content aloud when refining to clear and concise language
>
> Great Job! I would love to read your final draft, feel free to reach out as needed."

2nd expert: Dr. A.C.: EdD in Educational Leadership; teaches Precalculus Honors, AP Calculus AB, and Accelerated Algebra

> "Your questions look good. They are detailed and the answers will help you with your RQs."

3rd expert: Dr. J. M.: PhD in Education, MA in Secondary Education, BA in Mathematics; 13 years' experience teaching mathematics; 5 years' experience as an instructional coach/consultant/curriculum coordinator

> "I think your questions look good; just 2 comments. In your opening prompts #4 asks about "Have you ever been identified as gifted?" I am assuming here you mean the participant being gifted? At first I thought you were asking if they had a gifted certification but then thought otherwise. Do you want to know if they have a gifted cert or maybe this is a requirement of participation?
>
> When you ask them to describe their experiences, do you care when these experiences occurred? Some might be from years past and teachers might have evolved during that time. Just a thought to put a time frame or have them identify how recent these experiences occurred."

4th expert: Dr. A.P.: EdD in Educational Leadership; serves on dissertation committees; works as a graduate evaluator where she vets student research submissions for content and APA compliance; 9 years' experience as a mathematics educator; 3 years of experience as an instructional coach; 6 years of experience as an educational administrator

> "Hi Carrie. I really enjoyed reading the information about your study. The topic is very intriguing and I would love to read it when you are finished. Below are my comments and qualifications as you requested. Please let me know if I can be of further assistance.
>
> RQ1
> 1. Describe your experiences in working with gifted students on mathematics instruction in inclusive classrooms.
> 2. Describe your experiences in working with students identified as gifted in mathematics in inclusive classrooms.
>
> RQ2
> 1. How do you believe teachers are able to make a difference for gifted learners in inclusive mathematics classrooms?

RQ3
1. How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted your instructional practices?
2. How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted the academic achievement of your gifted students?

How is professional development defined for the purposes of your study? Your questions aligned to both RQ2 and RQ3 speak to formal and informal training. It is important that the individuals participating in the interview all have a consistent understanding of professional development.

Several questions speak to the phrasing "working with students on mathematics instruction". This phrasing can be confusing in interpretation as students typically do not work on instruction. Perhaps "working with students in inclusive mathematics classrooms" would clarify."

5th expert: Dr. G.C.: EdD in Foundations of Education, Leadership, Research, and Policy Studies, MEd in Higher Education Administration; 25 years' experience as an administrator in post-secondary education; experience teaching undergraduate students in education, sociology, psychology, counseling, and communications

"Do you feel that you can make a difference in the lives of gifted students in your inclusive mathematics classes? - Do you want this to be a yes or no question?

Are there any areas with regard to working with gifted students in inclusive classrooms where you feel you could benefit from additional training? - What areas instead of are there areas…"

Appendix E: Final Interview Protocol and Questions (After Vetting by Experts)

Initial Interview Protocol:

- Welcome and introductions
- Verbally restate the information in the informed consent form
- Explain the taping procedure, transcribing procedure (transcriptionist), and reviewing of data (by myself)
- Restate the purpose of the study
- Define the phrases "gifted students" and "professional development" as they relate to this study
- Opening prompts:

    1. How many years of teaching experience do you have?
    2. What grade level and subjects do you currently teach?
    3. What other grade levels and subjects have you taught?
    4. Have you ever been identified as gifted?
    5. How many identified gifted students are you currently working with on mathematics instruction in inclusive classrooms?
    6. How many of the students you are currently working with on mathematics instruction in inclusive classrooms are identified as being gifted specifically in mathematics?

- Follow the interview topics below, using probing questions as needed.

Research Question	Interview Questions
RQ1: What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?	• Please describe a challenging, motivating, or inspirational experience working with a gifted student on mathematics instruction in an inclusive classroom within the last five years. • Please share a second challenging, motivating, or inspirational experience working with a gifted student on mathematics instruction in an inclusive classroom within the last five years. • Are there any additional challenging, motivating, or inspirational experiences you would like to share with regard to working with a gifted student on mathematics instruction in an inclusive classroom?
RQ2: What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?	• Please describe the characteristics of gifted students as you understand them. • What obstacles, if any, do you encounter with regard to working with gifted students on mathematics instruction in an inclusive classroom? • What has been the most rewarding part of your job with regard to working with gifted students on mathematics instruction in an inclusive classroom? • How do you feel that you can make a difference in the lives of gifted students in your inclusive mathematics classrooms? • What formal training have you received that has prepared you to work with gifted students on mathematics instruction in an inclusive classroom? • Please describe any informal experiences that have prepared you to work with gifted students on mathematics instruction in an inclusive classroom. • Please share any areas with regard to working with gifted students in inclusive classrooms where you feel you could benefit from additional training.

RQ3: What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?	• How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted your instructional practices? • How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted the academic achievement of your gifted students?

Possible Probes:

- What was the experience like?
- Would you tell me when you experienced this? How did it feel?
- I want to be sure that I understand what you are saying. Do you mean …?
- Is there anything else you would like to add about your experience working with gifted students on mathematics instruction in an inclusive classroom?

Follow-Up Interview Protocol:

- Welcome and re-introductions
- Verbally restate the information in the informed consent form
- Re-explain the taping procedure, transcribing procedure (transcriptionist), and reviewing of data (by myself)
- Restate the purpose of the study
- Re-define the phrases “gifted students” and “professional development” as they relate to this study
- Follow the interview topics below, using probing questions as needed.

Research Question	Interview Questions
RQ1: What are the lived experiences of K–12 teachers who provide instruction for gifted students in inclusive mathematics classrooms?	• Please describe an additional challenging, motivating, or inspirational experience working with a gifted student on mathematics instruction in an inclusive classroom that occurred since our last interview. • Are there any additional challenging, motivating, or inspirational experiences you would like to share with regard to working with a gifted student on mathematics instruction in an inclusive classroom?
RQ2: What factors do teachers identify as influencing their self-efficacy in teaching gifted students in inclusive mathematics classrooms?	• Since our last interview, what obstacles, if any, have you encountered with regard to working with gifted students on mathematics instruction in an inclusive classroom? • Since our last interview, what has been the most rewarding part of your job with regard to working with gifted students on mathematics instruction in an inclusive classroom? • Since our last interview, what formal and informal training have you received that has prepared you to work with gifted students on mathematics instruction in an inclusive classroom?
RQ3: What are the perceptions of teachers regarding how their professional development influences the academic achievement of gifted students in inclusive mathematics classrooms?	• How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted your instructional practices, since our last interview? • How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted the academic achievement of your gifted students, since our last interview?

Possible Probes:

- What was the experience like?
- Would you tell me when you experienced this? How did it feel?
- I want to be sure that I understand what you are saying. Do you mean …?

- Is there anything else you would like to add about your experience working with gifted students on mathematics instruction in an inclusive classroom?

Appendix F: Participant Journaling Form

Dear **(Participant)**,

Thank you again for agreeing to participate in my study, and for taking the time to complete initial and follow-up interviews with me. In order to ensure that my data is as complete and accurate as possible, I invite you to use this form to document any additional responses to my initial interview questions that you may think of between now and our follow-up interview.

If you have any responses to share, I will collect your form at the start of our follow-up interview, either in-person or via email.

Please feel free to write or type your responses directly on this form.

- Are there any additional challenging, motivating, or inspirational experiences you would like to share with regard to working with a gifted student on mathematics instruction in an inclusive classroom? If so, please describe them here.

- Please describe the characteristics of gifted students as you understand them.

- What obstacles, if any, do you encounter with regard to working with gifted students on mathematics instruction in an inclusive classroom?

- What has been the most rewarding part of your job with regard to working with gifted students on mathematics instruction in an inclusive classroom?

- How do you feel that you can make a difference in the lives of gifted students in your inclusive mathematics classrooms?

- What formal training have you received that has prepared you to work with gifted students on mathematics instruction in an inclusive classroom?

- Please describe any informal experiences that have prepared you to work with gifted students on mathematics instruction in an inclusive classroom.

- Please share any areas with regard to working with gifted students in inclusive classrooms where you feel you could benefit from additional training.

- How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted your instructional practices?

- How has the formal and informal training you have received with regard to working with gifted students in an inclusive mathematics classroom impacted the academic achievement of your gifted students?

Appendix G: Transcriptionist Confidentiality Agreement

Name of Signer (Transcriptionist):

During the course of my activity in transcribing interview data for this research: "Teacher Beliefs about Providing Instruction for Gifted Students in Inclusive Mathematics Classrooms" I will have access to information, which is confidential and should not be disclosed. I acknowledge that the information must remain confidential, and that improper disclosure of confidential information can be damaging to the participants.

By signing this Confidentiality Agreement I acknowledge and agree that:

1. I will not disclose or discuss any confidential information with others, including friends or family.
2. I will not in any way divulge, copy, release, sell, loan, alter or destroy any confidential information except as properly authorized.
3. I will not discuss confidential information where others can overhear the conversation. I understand that it is not acceptable to discuss confidential information even if the participant's name is not used.
4. I will not make any unauthorized transmissions, inquiries, modification or purging of confidential information.
5. I agree that my obligations under this agreement will continue after termination of the job that I will perform.
6. I understand that violation of this agreement will have legal implications.
7. I will only access or use systems or devices I'm officially authorized to access and I will not demonstrate the operation or function of systems or devices to unauthorized individuals.

Signing this document, I acknowledge that I have read the agreement and I agree to comply with all the terms and conditions stated above.

Signature: **Date:**

Appendix H: NAGC-CEC Teacher Preparation Standards in Gifted and Talented Education

(National Association for Gifted Children, 2013)

Standard 1: Learner Development and Individual Learning Differences

Beginning gifted education professionals understand the variations in learning and development in cognitive and affective areas between and among individuals with gifts and talents and apply this understanding to provide meaningful and challenging learning experiences for individuals with exceptionalities.

Standard 2: Learning Environments

Beginning gifted education professionals create safe, inclusive, and culturally responsive learning environments so that individuals with gifts and talents become effective learners and develop social and emotional well-being.

Standard 3: Curricular Content Knowledge

Beginning gifted education professionals use knowledge of general and specialized curricula to advance learning for individuals with gifts and talents.

Standard 4: Assessment

Beginning gifted education professionals use multiple methods of assessment and data sources in making educational decisions about identification of individuals with gifts and talents and student learning.

Standard 5: Instructional Planning and Strategies

Beginning gifted education professionals select, adapt, and use a repertoire of evidence-based instructional strategies to advance the learning of individuals with gifts and talents.

Standard 6: Professional Learning and Ethical Practice

Beginning gifted education professionals use foundational knowledge of the field and professional ethical principles and programming standards to inform gifted education practice, to engage in lifelong learning, and to advance the profession.

Standard 7: Collaboration

Beginning gifted education professionals collaborate with families, other educators, related service providers, individuals with gifts and talents, and personnel from community agencies in culturally responsive ways to address the needs of individuals with gifts and talents across a range of learning experiences.