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Teacher Perspectives of their Challenges in Supporting K-3 Students in Mathematics Proficiency

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2026

Abstract

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MA, Walden University, 2018

BS, Bowie State University, 2015

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Early Childhood Education

Walden University

February 2026

Abstract

The problem for this study was that mathematics preparation for students in K–3 classrooms often does not lead to mathematics proficiency for third grade students. Guided by Wigfield's expectancy value theory, the purpose of this qualitative study was to explore teachers' perspectives of children's expectations and values related to mathematics and challenges teachers describe in supporting children's mathematics achievement. Data were collected through 12 semistructured interviews with K–3 teachers in in a public school district in the eastern United States. Thematic analysis using open coding resulted in six themes which indicated that teacher beliefs and expectations are associated with mathematics knowledge; students hold beliefs, experiences and expectations associated with mathematics knowledge and ability levels; students' mathematics challenges affect their ability to achieve mathematics proficiency within grades K–3 ; classroom measures are in place to help students better understand the subject of mathematics; family influences are associated with students' behaviors and success in mathematics; and teachers have expertise and knowledge regarding mathematics. Results of this study revealed that teachers are aware of motivational factors affecting students' beliefs and expectations in mathematics. Further study is recommended to determine levels of achievement expectancy among students in 4th to 8th grade. Positive social change may result when teachers' perspectives of students' mathematics challenges are understood, and teachers use motivational strategies to help students achieve mathematics proficiency which will enable them to be successful and productive citizens throughout life.

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Dedication

I first dedicate this doctoral study to my Lord and Savior Jesus Christ. With consistent prayer, dedication, and patience God guided me through this journey to finish successfully. To my mother, Renata Mills thank you for being my number one supporter. You have always pushed me to focus on my studies and remain consistent in learning more in life. I was inspired by friends and family to continue my educational journey, and this study is completed because of you all. Thank you all for keeping me grounded and pushing me to finish strong!

Acknowledgments

I would like to first thank God for creating a path for me to continue my education to support young learners and other early childhood educators. This has been a challenging journey and with prayer, I did not quit. I would like to thank my previous and current students for continuing to encourage me to become Dr. Mills. I would like to thank my family and friends for believing in me and giving me the time that I needed to focus on my studies. I would like to thank my church family for praying for me throughout this journal, especially Pastor Anthony E. Moore, Lady Cynthia Moore, Elder Matthew and Deacon Sharon Durham, Elder Samuel Hale, and Associate Pastor Bessie Hayes. The prayers, encouragement, support, and love that you all have provided to me is truly appreciated.

I would like to thank my chair, Dr. Patricia Anderson, for your continued support, consideration, countless revisions, and patience. Thank you for always being available to help me no matter the day or hour. I am forever grateful for your guidance in helping me finish this journey. Thank you, Dr. Shannon Walker (second chair) also for your guidance and support with helping me finish this journey. Lastly, I would like to thank my co-workers and the other educators seeking higher education that I met during this journey. I will forever be grateful for all of your support in helping me complete my doctorate degree in education. With the support of you all, I am now Dr. Mills.

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Chapter 1: Introduction to the Study

Low achievement in mathematics has been evident in early childhood education for decades (Ribner et al., 2023). I conducted this study to explore teachers' perspectives with supporting students in the K–3 classrooms in achieving mathematics proficiency. Using two research questions, I explored perspectives of 12 K–3 teachers regarding children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. Positive social change may result when teachers' perspectives of students' mathematics challenges are understood and administrators support teachers in using motivation to help students achieve mathematics proficiency.

Background

According to Rainey et al. (2024), early childhood is an essential time to shape a child's understanding and skill in mathematics. Rainey et al. (2024) reported that in the U.S. students repeatedly score below average on mathematics achievement tests. Students in the United States take assessments that are conducted by The National Assessment of Educational Progress (NAEP), which is administered by the National Center for Education Statistics (NCES, 2024). Before students complete NAEP assessments they show signs of low mathematics proficiency. Doabler et al. (2021a) found that students who have learning challenges in mathematics at the beginning of kindergarten may experience low growth trajectories in later grades. Gullo and Impellizeri (2021) explored the achievement trajectories of students prior to fourth grade testing and found that students in kindergarten showed signs of poor mathematics skills which affect later

mathematics achievement. Mazzocco et al. (2024) explained that students who are underperforming on mathematics achievement tests in kindergarten and first grade show later low achievement outcomes on future tests 2 to 3 years later. These studies indicated that students in kindergarten through third grade show challenges in mathematics proficiency prior to state assessments.

Hunt et al. (2023) suggested that teacher factors in grade levels kindergarten through third grade can lead to poor mathematics instruction, which affects students' ability to show mathematics proficiency on state assessments. These factors include the level of excellence of mathematics teaching, teachers' content knowledge, and teachers' pedagogical understanding of ways to improve students' mathematics performance. Teachers' feelings about teaching mathematics affect their quality of teaching mathematics, based on their understanding of the mathematics curriculum, their confidence in extending students' understanding of the lessons being taught, and confusion about new skills and strategies they may themselves not understand (Li & Copur-Gencture, 2024). Teachers in early grade levels set the tone for their classrooms and influence their students understanding of the content taught on a daily basis (Pyne et al., 2024).

K–3 teachers who have challenges teaching students who lack mathematics proficiency have challenges with understanding how to support young learners and incorporate differentiated lessons. Novice teachers new to teaching mathematics instruction may need support in increasing student performance in mathematics (Bharaj et al., 2023). Teachers are pressured into setting learning goals to address students'

performance in mastery and feel challenged to do that because of their own lack of self-efficacy in ways to increase mastery and performance in mathematics (Gonzalez-DeHass et al., 2022). McNeill and Polly (2023) found that, especially in early grades, many elementary school teachers lack confidence and ability to improve students mathematics skills. In this study, my purpose was to explore teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement.

Problem Statement

The problem that I addressed in this study is that mathematics preparation for students in kindergarten through third grade does not lead to mathematics proficiency of third grade students as measured by state assessments. During kindergarten through third grade, students acquire the knowledge and skills in mathematics needed to demonstrate mastery of grade level mathematics expectations when taking state assessments at the end of third grade. Fleckenstein et al. (2019) stated that the mathematics skills that children learn in elementary school are key building blocks to what they will learn later in school and mathematics proficiency is essential during this time. Ribner et al. (2023) stated that children who enter kindergarten with few mathematics skills will not develop at the same rate when compared to their peers who enter kindergarten with more skill in mathematics. Persistent failure in mathematics can lead to reduced expectations for success in mathematics tasks, and loss of interest in learning mathematics (Scammacca et al., 2020). Gullo and Impellizeri (2021) stated that if kindergarten children are not showing knowledge and understanding of core mathematics skills, including early numeracy

skills, number knowledge, number transformation, estimation, and number patterns, it is likely that challenges will occur with later mathematics achievement and competencies. Gullo and Impellizeri (2021) also stated that major academic milestones are evaluated at the end of kindergarten and third grade.

The assessment authority in the state that is the location of this study reported that student performance in 2023 was lower in grade levels third to eighth grade when compared to the 2021 school year. The assessment authority in the state of this study also reported that student scores for mathematics revealed an even larger drop in school year 2022-2023, at 36% down from school year 2021-2022. In the district that is the location of this study, in school year 2022-2023 only 20% of students in grade levels third to eighth grade showed proficient scores on the mathematics assessment, meaning that 80% scored less than proficient. The information gathered from the assessment data in the district that is the location of this study revealed that in the 2022-2023 school year, low proficient beginning learners were still not achieving proficient scores on the mathematics assessment at the end of the school year. The outcome suggests a gap in practice that, as Ribner et al. (2023) suggested, may indicate a widespread problem.

Purpose of the Study

The purpose of this study was to explore teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. By exploring teacher perspectives of K–3 students' interest in mathematics and expectations for mathematics mastery, and the challenges teachers encounter, other educators who

may be faced with similar challenges may gain understanding to how to help the students they teach.

Research Questions

Research Question 1 (RQ1): What are K–3 teachers' perspectives of children's task-associated expectations and values as they relate to the problem of lack of mathematics proficiency as measured by state assessments?

Research Question 2 (RQ2): What are the challenges K–3 teachers describe in supporting children's task-associated expectations and values as they relate to mathematics achievement?

Conceptual Framework

The conceptual framework of this study was the expectancy value theory (EVT) as described by Wigfield (1994). Wigfield (1994) proposed that people are motivated to complete tasks at expected levels of achievement when they believe they can be successful and when they value the task outcome. Students in early elementary grades have beliefs and values about how they will perform on assigned tasks in mathematics (Wigfield, 1994). Children's academic success, determination, and task choices are determined by children's beliefs and expectancies for success on tasks (Wigfield, 1994). Expectancy value theory has been used to provide insight to educators on how students view success and their value for learning in school. EVT can be used to investigate academic achievement across different factors, including gender, cognitive abilities, socioeconomic status and school grouping (Meyer et al., 2019). The theory was an appropriate framework for this study because it explores teacher perspectives and gives

insight to the factors that have affects with student success in mathematics. The theory and how it relates to this study is discussed further in Chapter 2.

Nature of the Study

This was a basic qualitative study using interviews, as described by Fornaro et al. (2021). Fornaro et al. (2021) stated that interviews are often the central point of qualitative data collection. A qualitative research approach using interviews was used to reveal 12 teachers' perspectives with the challenges they face in supporting students in mathematics proficiency. Unlike a quantitative method, such as a survey, interviews permit both the researcher and the participants to elaborate on the topics discussed or questions asked, to achieve a rich explanation of participants' perspectives. Qualitative research focuses on people's ideas, lived experiences, and perspectives of the world (Ravitch & Carl, 2021).

The phenomenon of interest with this study consisted of teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. By investigating this phenomenon through interviews with 12 kindergarten through third grade teachers who worked in a public school district in the eastern United States. Interviews were audio-recorded and transcribed using in vivo coding, as described by Saldaña (2021). A full description of my data analysis plan is presented in Chapter 3.

Definitions

Math anxiety: Feelings of apprehension which negatively affect one's ability to complete mathematics tasks. (Richardson & Suinn, 1972).

Self-efficacy: One's beliefs in one's capability to complete a specific task (McNeill & Polly, 2023).

Situated expectancy-value theory: Various factors that contribute to a student's motivation and expectation of success on academic tasks (Rosenzweig et al., 2022).

Assumptions

In this study, I assumed that the teachers being interviewed would be honest about their perspectives in challenges in supporting K–3 students in mathematics proficiency. I also assumed that the teachers would be knowledgeable about the mathematics curriculum taught in grades K–3**.** The assumptions were necessary for this study because the data provided by informants and whose truthfulness and knowledge of the topic are unknown and must be presumed (Ravitch & Carl, 2021). Therefore, the perspectives of the participants did provide detailed information regarding the challenges and experiences they had with supporting students in mathematics proficiency.

Scope and Delimitations

The scope of this study was K–3 teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. In this qualitative study, research stated that students in third grade in the state that is the focus of this study continued to score below proficient in mathematics; low achievement in mathematics is widespread among American third grade students (Ribner et al., 2023). This study was delimited to 12 K–3 teachers who taught mathematics in general education classrooms and who had 2 or more years of experience in a public school

setting. Teachers excluded from this study included teachers with less than 2 years of experience, teachers who exclusively taught students with special needs, and those who taught non-academic subjects such as physical education, art, or music. Also excluded were teachers of special populations in exclusive classrooms, such as gifted students or students whose first language is not English.

Limitations

Limitations related to this study included the possibility that there could be incomplete testing data due to the effects of the COVID-19 pandemic. During the COVID-19 pandemic, attendance was an issue for state testing because many students were absent or did not complete state testing administered online during distance learning. The limitation of incomplete testing data was not mentioned by teachers as a concern but inconsistent attendance in school was mentioned as an effect resulting in students' ability to complete mathematics tasks successfully. Another limitation that I anticipated for this study included the ongoing concerns about transmissible diseases, so interviews were conducted over Zoom instead of in person. Prior to conducting interviews, potential connectivity limitations were addressed by making sure that my internet was reliable enough for recorded interviews. I also provided participants with a number to dial in if they are experiencing several issues with connectivity during the interview. During the interviews participants were asked to find a private setting to reduce background noise and ensure accurate transcription. The possible limitations did not affect my ability to conduct interviews and further information about limitations is discussed in Chapter 5.

Significance

In this study I explored teachers' perspectives of children's ability-expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. I also explored the challenges teachers encountered in the classroom that lead to low proficiency in K–3 mathematics, to provide insight into the support, training, and resources teachers believed could help them in overcoming these challenges. Schillinger (2021) explained that qualitative analysis of teachers' self-efficacy in teaching mathematics can bridge the gap between mathematics skills taught and application of those skills on assessments and in everyday life. Day (2020) reported that when teachers align theory to practice using a research based theory, teachers have a better understanding of factors that contribute to mathematics achievement gaps. Positive social change may result when teachers' perspectives of students' mathematics challenges are understood and administrators support teachers in using motivation to help students achieve mathematics proficiency.

Summary

In this chapter, I described the problem of low mathematics achievement among K–3 students and the purpose of this study of exploring teachers' perspectives regarding low mathematics achievement and the supports they need to support students in becoming proficient in mathematics. The work of Wigfield (1994) will form the conceptual framework for this study. I described background information regarding the problem in the study state as reported in test scores, which suggested a gap in mathematics practice. In addition, I provided a brief description of the nature of the

study, definitions, assumptions, scope and delimitations, limitations, and significance of the study. In Chapter 2, I present a review of literature used to inform this study and a detailed explanation of the conceptual framework used in this study is presented.

Chapter 2: Literature Review

The problem that I addressed in this study was that mathematics preparation for students in K–3 classrooms does not lead to mathematics proficiency of third grade students. The purpose of this study was to explore teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. In this chapter, I present the current literature and provide reasoning for the ongoing issues with K–3 students in mathematics mastery. I present teacher perspectives of the challenges they are facing to support their K–3 students in the classroom. For example, Scammacca et al. (2020) found that the mathematics growth of students with preexisting mathematics difficulties is slower than the mathematics growth of students who have exhibited no prior mathematics difficulties. In this chapter, I present the literature search strategy that I used, conceptual framework selected, and a review of the current literature related to the topic for this study.

Literature Search Strategy

The databases that I used to locate research articles included resources of the Walden University Library, ProQuest, EBSCO Host, and Google Scholar. While searching this topic, I used the following search terms *math, mathematics, mathematics instruction, mathematics proficiency, achievement gap, math learning, academic achievement, math development, mathematics achievement, elementary mathematics, student challenges, student struggle, elementary education,* and *early childhood.* In addition to the above terms, I used the following search terms to locate literature

regarding teacher perspectives and the conceptual framework: *teacher perceptions, teacher attitudes, teacher perspectives, teacher beliefs, kindergarten teachers, first grade teachers, second grade teachers, third grade teachers, k-3 classrooms, elementary school teachers,* and *expectancy value theory.* Through an iterative process, I used these search terms to help with finding additional articles that were related to the topic for this study. No new search terms or information were found after I achieved saturation.

Conceptual Framework

The phenomenon of interest for this study consisted of teacher perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. The conceptual framework for this study was the work of Wigfield (1994) in the expectancy value theory of achievement motivation (EVT) and the expectancy value model outlined by Eccles et al. (1983). EVT describes how an individual views their expectancy for success and the beliefs that shape their motivation and performance in an instructional setting (Wigfield, 1994). Wigfield and Eccles (2020) developed EVT with four major components from the perspective of an actor: the subjective intrinsic value of the task, the attainment value or importance the actor associates with the task outcome, the utility value or usefulness of the task, and the cost the actor associates with the task or with potential task outcomes (Wigfield & Eccles, 2020). Eccles et al. (1983) defined attainment value as the perception a person has of doing well on a task because it matters to them. Subjective value refers to the mindset a person has about the task and if the task is important or worth completing (Eccles et al., 1983). Utility value refers to a student's

perception of a task as beneficial for future goals (Eccles et al., 1983). Cost is to the time, effort, and sacrifices a person must put into executing a task (Eccles et at., 1983). EVT was defined and measured through the expectancies of children's beliefs (Eccles et al., 1983). Eccles et al. (1983) defined children's ability beliefs as the individuals' assumption of their ability level in completing a given task. Guided by the work of Wigfield and following the work of Eccles, EVT provided a framework to help with understanding how the use of student motivation helps students to be successful in school.

Other theorists proposed ideas foundational to EVT as described by Wigfield. Atkinson (1957) defined expectancies as an individual's anticipation of their performance outcome, including whether they will succeed or not succeed. Eccles et al. (1983) developed an expectancy-value model of achievement which was related to choices and which built on the work of Atkinson (1957). Eccles's work expanded and changed through further research, in collaboration with Wigfield and others. Bandura (1997) discussed self-efficacy and the relation it has to children's anticipation of their success. Bandura contrasted efficacy expectations as they relate to an individual's belief about the method by which they will accomplish a task with their outcome expectancies for failure or success (Bandura, 1997). The work of Eccles, Atkinson, and Bandura provided examples of expectancies and self-efficacy which contributed to the work of Wigfield.

Other researchers have also used EVT to explore achievement and expectancies with elementary grade children. Muenks et al. (2018) used EVT to research the development of predictions of success in achievement tasks among kindergarten through

twelfth grades students. Muenks et al. (2018) found that the positive and negative feedback received from parents or teachers shaped children's expectancies in the classroom. Rosenzweig et al. (2022) used EVT to research the situated experiences children encounter in the learning environment, including achievement task and interest in assignments. Rosenzweig et al. (2022) determined that situated expectancy-value theory could be used as an intervention to develop in students the four major components of EVT. The studies conducted by these researchers explored the use of EVT as a framework for research which contributed to the information needed to learn more about the development of children in elementary school.

Wigfield and Eccles (2020) applied EVT specifically to mathematics achievement. According to Wigfield (1994), expectancy-value beliefs can predict academic achievement in both reading and mathematics. Wigfield and Eccles (2020) suggested that expectancies and values are determined by an individual's perception of and anticipated competence in completing tasks. Expectancies for success in children rely on their performance in a task and whether they will succeed or fail (Wigfield, 1994). Wigfield and Eccles (2020) suggested that it is appropriate to ask young children about their thoughts about a task given due to their unique way of thinking which may not be anticipated by an adult. Children's value for a mathematics task changes when they are less competent and they begin to value those activities less (Wigfield & Eccles, 2020). Expectancies for success and values in mathematics have differences because the expectancy is based on a child's perception of the task and the values is based on whether the child is competent in completing the task.

I used EVT for this study to explore teacher perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. I used this theory to create interview questions to pose to teachers when discussing children's interest in mathematics and their expectancies for mathematics success, and the challenges these values and expectations create for teachers in supporting children's mathematics achievement. EVT made an effective framework for this study because the factors outlined within the framework provided an understanding to the affects related to children's achievement in mathematics in elementary school.

Review of Literature Related to Key Variables and Concepts

In this literature review I address topics of problems with mathematics proficiency, how mathematics is measured, student characteristics in mathematics failure and success, and teacher characteristics in mathematics failure and success will be discussed. I conclude this literature review with topics of teacher's mathematics expectancy-value profiles.

The Problem of Poor Primary Grade Mathematics Proficiency

The problem that primary grade students have with mathematics proficiency is reflected in their level of academic achievement. Gjicali and Lipnevich (2021) reported that American students lag behind students in other developed nations in mathematics performance. Powell et al. (2020) stated that students experience difficulty in learning mathematics. According to the National Center for Education Statistics (NCES), age 9 student mathematics scores decreased by 7 points when compared to their scores in 2022

(NCES, 2022). The National Assessment of Educational Process (NAEP), known as the Nation's Report Card, provides indicators for how students in fourth, eighth, and 12th grades perform in reading and mathematics tests in the United States (Muhammad et al., 2021). The average student score in fourth grade was 236 in 2022, which was lower than the score of 241 in 2019 (NCES, 2022). In 2022, about 25% of fourth grade students performed below the basic level, about 39% performed at the NAEP Basic achievement level in mathematics, about 29% performed at the NAEP Proficient level, and about 8% performed at the NAEP Advanced level (NCES, 2022). The mathematics data outlined showed that students in the United States are challenged in mathematics and the assessment scores for third grade indicates that there is a problem with primary students' mathematics proficiency, and it does lead to further problems in later grade levels.

Brafford et al. (2023) suggested that children who struggle with mathematics in preschool and kindergarten can experience reduced proficiency performance later in school. Dong et al. (2024) found that children who enter kindergarten after attending prekindergarten or HeadStart show more academic gains than children who did not attend preschool. Dong et al. (2024) also found that mathematics outcomes in elementary school boys typically are greater than those of elementary school girls. Reardon et al. (2019) suggested this gender effect in mathematics achievement is prevalent in higher-income school districts. Levine and Pantoja (2021) suggested that gender differences in early mathematics tests scores are related to boys' and girls' attitudes about mathematics. Little et al. (2020) found that in the early elementary school years, kindergarten through second grade children had different growth rates in reading and mathematics. Doabler et al.

(2021a) found that students beginning and completing kindergarten with scores below the 10th percentile on mathematics assessments were likely to display mathematics challenges in later grades. The data suggested that young children who experience challenges in mathematics will have later challenges also.

NWEA et al. (2022) focused on the effects of student performance of students in first and second grade in the 2021-2022 school year who took the Measure of Academic Success growth assessment in reading and mathematics. NWEA et al. (2022) stated that the data from spring 2022 showed 3 to 8 percentile lower achievement in mathematics when compared to 2019 first grade and second grade mathematics achievement. Rambo-Hernandez et al. (2022) suggested that most of the diversity in achievement is an artefact of students coming into school with variety of learning needs. The research conducted suggested that children in elementary school learn at different rates. The performance data also suggested that problems in mathematics begin in first and second grade, before students start taking state assessments.

How Mathematics Proficiency Is Measured

Mathematics proficiency is defined as student performance in conceptual, procedural, and problem solving skills (Muhammad et al., 2021). Muhammad et al. (2021) suggested that proficiency in mathematics described by assessment developers involves application of conceptual understanding and procedural knowledge. Pulles and Burns (2022) suggested that student outcomes with a focus on conceptual understanding and procedural knowledge can assist students in making better connections in mathematics. Conceptual understanding consists of students being able to use

mathematics strategies to solve problems (Pulles & Burns, 2022). Procedural knowledge refers to being able to apply mathematics strategies in solving real life problems. Both conceptual understanding and procedural knowledge can increase students' proficiency in mathematics by helping students process and solve the information learned in school.

In elementary school classrooms mathematics proficiency can be measured using curriculum-based assessments in mathematics. Curriculum-based measures have evolved from being a measurement for teachers of students' understanding on a topic to a tool for monitoring individual students' progress and identification of individual students' needs (Nelson et al., 2023). Kuhfield and Soland (2021) found that the Measure of Academic Success could be used as an assessment tool in mathematics with students in early grade levels. Tarker et al. (2022) also found that IXL, an online learning platform could be used as an assessment tool for mathematics in early grade levels. Mingo et al. (2020) wrote that curriculum-based measurements are direct assessments of academic achievement and are used to measure students' learning and skill attainment. Curriculum-based measurements identify students' academic levels, help students and teachers set goals, and support evaluation of teachers' instructional practices (Doabler et al., 2021b). VanDerHeyden et al. (2023) stated that the use of curriculum-based measurements can accurately determine a child's academic performance in mathematics.

In elementary school a student's ability to demonstrate their understanding in mathematics is measured based upon the information they are taught in school (Clarke et al., 2023). To measure a student's conceptual understanding of mathematics in early grade levels, K–2 teachers determine students' understanding of concepts teachers have

taught and the need for future teaching or reteaching (Fuoco et al., 2024). Lee (2024) stated that a child's understanding of mathematics procedural skills for kindergarten, first, and second grade include telling time, addition and subtraction, place value, writing numbers, and using mixed operations. Lee (2024) also stated that a child's mastery of mathematics skills is measured by the teacher's instructional objectives based on the curriculum being taught in school. When measuring a student's procedural knowledge, educators measure a student's ability to solve step by step problems taught in school based on their knowledge of procedures (Braithwaite & Sprague, 2021). Braithwaite and Sprague (2021) suggested that students who have the ability to solve problems using procedural knowledge will rely on conceptual knowledge to help them solve problems some of the time. Yap and Wong (2024) stated that word problems are often the most challenging for students and require them to identify the procedures needed to solve the problem to successfully solve the mathematics problem. Mathematics competence is achieved through development of both conceptual and procedural knowledge and is demonstrated through evidence of understanding of mathematics concepts and procedures (Fuoco et al., 2024).

Mingo et al. (2020) suggested that instructional assessments can serve as predictors to identify students who may fail in the future. Stipek (2024) noted that by curriculum-based measurements that identify a child's understanding of mathematics, schools could track progress to improve instruction in the classroom. Schweig et al. (2020) stated that teachers spend more time reviewing previously learned content to students who were identified through assessment as low than focusing on the learning

tasks and standards taught in their current grade levels. Yap and Wong (2024) suggested that students who are guided to learn how to correct their procedural errors when solving problems can enhance their understanding when solving mathematics problems, including equations and word problems. The research suggested that prior to state testing students who show challenges in mathematics skills need to be assisted in their development of mathematics proficiency.

Student Characteristics in Mathematics Failure and Success

Students in early grades who perform poorly in mathematics tend to share particular characteristics. For example, students' experiences with mathematics instruction in pre-kindergarten programs can affect their success or failure in elementary grade mathematics, based upon their exposure to a structured classroom and curriculum (McCormick et al., 2022). Some students may have differential experiences based upon their gender and self-efficacy in which can lead to success or failure in learning the necessary mathematics strategies and skills taught during the school year (Downey et al., 2022). In addition to prior instructional experiences, gender differences, and self-efficacy development, students may develop math anxiety during elementary school that can interfere with their success and development in mathematics skills over time (Lu et al., 2021).

Development in mathematics can be strengthened with exposure to mathematics in formal early childhood educational experiences (Burchinal et al., 2023). According to McCormick et al. (2022), early learning environments such as prekindergarten can promote academic development in mathematics because of the instructional experiences

students receive in the program. Vitiello et al. (2022) suggested that programs such as Head Start or prekindergarten can have a positive effect on students' academic success in mathematics if the program is structured and allows for students to have time to practice mathematics skills. Vitiello et al. (2022) also suggested that an increase in academic rigor in these programs can support children's development in mathematics skills in ways that lead to successful outcomes in school. Mazzocco et al. (2024) found that students who had no formal education prior to kindergarten score below average in kindergarten and first grade and are more likely to underperform on various aspects in mathematics 2 to 9 years later compared to their peers. Children who receive mathematics instruction prior to elementary school can show success in mathematics and children who lack mathematics instruction in early childhood education settings may be unsuccessful.

Gender differences play a part in how students master mathematics. Downey et al. (2022) found that while boys learn mathematics concepts during the school year because of their exposure to mathematics instruction in school, girls learn better with gaps in mathematics education, such as typically happens in the summer months, because these gaps provide time to practice the mathematics skills taught during the school year. Schaeffer et al. (2020) reported that the attitudes of students' caregivers towards mathematics can affect mathematics learning in school because of the amount of exposure both boys and girls receive in mathematics through out of school support and learning. Hofkens et al. (2022) suggested that in school girls may develop and grow quicker in their mathematics skills based upon the close relationship they have with their female teachers. Fish et al. (2023) found that boys are more game driven when learning

and enjoy game based activities that can contribute to their growth in learning mathematics. The learning environment can influence students' self-efficacy advancement in mathematics (Yang et al., 2024). Tassell et al. (2020) suggested that student self-efficacy is the main factor that impacts students' confidence and understanding in mathematics. McNeill and Polly (2023) reported that improving a child's sense of self-efficacy in elementary school can positively increase their performance in mathematics instruction. McNeill and Polly (2023) also suggested that it is important to develop a child's growth mindset and perception to influence their self-efficacy in mathematics instruction. Gender and self-efficacy are factors that can shape students' performance in mathematics.

Tarkar et al. (2022) suggested that math anxiety is well-known as a handicap to that affects students' learning. Mohring et al. (2024) students who experience anxiety in mathematics face difficulties in completing arithmetic problems. Lu et al. (2021) found that first- through third-grade students' believed that they were less competent in mathematics due to experiences of math anxiety. Schaeffer et al. (2020) suggested that fear and apprehension regarding mathematics, lower levels of performance, and less engagement in mathematics can be due to students' math anxiety. Schaeffer et al. (2020) also suggested that students whose parents experience math anxiety are less likely to receive effective mathematics help at home. Lack of mathematics support at home affects students' learning abilities in mathematics by contributing to learning loss or stagnation in their development of mathematics skills taught in school (Schaeffer et al., 2020). Becker et al. (2022) found that parents with math anxiety can hinder their children due to

limited engagement and support in completing mathematics tasks at home. Math anxiety, along with poor early childhood education in mathematics, gender differences, and differences in mathematics self-efficacy, can factor into students' success or failure in school based upon the support they receive in overcoming doubts about being successful in learning and enhancing their mathematics skills.

Teacher Characteristics in Mathematics Failure and Success

Teachers in early elementary school often share characteristics in teaching mathematics that can affect student success. These characteristics involve teachers' mathematics knowledge and value for mathematics, teaching efficacy, and mathematics anxiety. Copur-Gencturk et al. (2021) found that teachers' beliefs can have an important influence on students' mathematics ability levels in the classroom. Chen et al. (2022) suggested that teaching efficacy can influence teachers' overall teaching competency. Becker et al. (2022) found that children's mathematics outcomes are influence by the degree of their teachers' math anxiety.

For example, Pyne et al. (2024) stated that teachers influence the students they teach and understanding teachers' knowledge, beliefs, and attitudes can offer insight into how students learn in the classroom. Li and Copur-Gencturk (2024) found that when a teacher has a strong understanding of the mathematics content, they can support their students with mathematics reasoning and encourage fresh avenues of student engagement in the classroom. Auslander et al. (2023) suggested that teacher beliefs in delivering instruction can affect how they address misconceptions in mathematics lessons and students' decision-making process during mathematics lessons. Hunt et al. (2023)

suggested that teacher beliefs and level of confidence in delivering instruction can affect the extent to which mathematics is taught in the classroom, by implementing new strategies and techniques. Hunt et al. (2023) also suggested that in some elementary classrooms, teachers' perceive mathematics as less important and believe that less time should be devoted to exploration of mathematics concepts during the instructional time compared to time devoted to other subjects. McLean et al. (2024) found that teacher effectiveness in the classroom is closely related to their experience in teaching mathematics. McLean et al. (2024) also found that teacher appreciation for the content can affect students' engagement in the lessons being delivered and could affect students' opportunities to engage in the mathematics content and influence their learning. A teacher's level of confidence in delivering mathematics instruction and personal beliefs about mathematics can affect a student's success or failure in mathematics.

Teaching efficacy in mathematics can also affect students' success and failure in mathematics. Leavy et al. (2023) suggested that teachers' efficacy beliefs are affected by the confidence they have in their own skills to promote student academic progress. Leavy et al. (2023) found that low teaching efficacy contributes to teacher stress and doubt in their ability to support all students in meeting benchmarks. Chen et al. (2022) found that teachers who feel highly efficacious set challenging educational goals for students and are less intimidated by failure of student learning in their classrooms than less self-confident teachers. Latterell and Wilson (2024) found that teachers may have subjective feelings involving mathematics based on their lived experiences and these can affect teachers' success in implementing mathematics lessons with their students. Auletto and

Cooper-Stein (2020) found that low-performing students affect teachers' lesson delivery and instructional practices. Teaching efficacy is a factor that affects students' success and failure in mathematics.

In addition to teachers' understanding, beliefs, and feelings of instructional efficacy, math anxiety is another shared characteristic in many teachers that may affect their teaching of mathematics. Burte et al. (2020) found that a teacher's anxiety about teaching mathematics can lower students' mathematics achievement. Burte et al. (2020) also found that teachers' anxiety about mathematics may influence students' performance in mathematics and possibly result in declines in mathematics achievement. Gonzalez-DeHass et al. (2022) suggested that majority of teachers in the K–5 classroom are females and often face math anxiety due to prior learning experiences which impact their levels of confidence in teaching mathematics. Jameson et al. (2024) found that math anxiety more prevalent in female teachers than in male teachers. Gonzalez-DeHass et al. (2022) reported that math anxiety can affect a teacher's performance goals in their personal understanding of mathematics content and instruction. Jameson et al. (2024) found that teachers and students experience barriers that negatively affect their mathematics skills. The research implied that teachers' math anxiety, along with teachers' understanding and beliefs regarding mathematics content and their teaching efficacy, can affect students' success or failure in mathematics in the K–3 classroom.

Students' and Teachers' Mathematics Expectancy-Value Profile

Students and teachers share similar thoughts, feelings, and attitudes towards their value of mathematics and their expectancy for success in the mathematics classroom.

John et al. (2020) stated that core components of EVT in the realm of mathematics learning and instruction include individuals' mathematics self-expectancy and value for mathematics. Peterson and Zengilowski (2024) suggested that EVT is an important predictor of teaching-related choices and outcomes. Peterson and Zengilowski (2024) also suggested that examining educators' and students' perspectives and emotions during learning provides insight that can be applied in supporting students who have knowledge gaps and feelings of uncertainty. By exploring students' and teachers' expectancies and value for mathematics success, researchers have demonstrated similarities between students and teachers.

For example, Finn et al. (2023) found that achievement motivation is related to academic experiences that are enjoyable and engaging. Finn et al. (2023) reported that teachers who encourage students to solve complex mathematics problems enhance students' performance. Students gain confidence in completing mathematics tasks when teachers prioritize understanding of mathematics concepts (Klee et al., 2022). When students are supported in working hard to solve problems and are given opportunities to explain their reasoning for answers on mathematics tasks, their positive attitudes towards engaging in mathematics increase (Klee et al., 2022). Dunning (2023) found that student engagement can increase when teachers incorporate strategies for whole class discussions to build upon students' mathematics thinking and understanding. Dunning (2023) also found that during whole group class discussions student engagement increases because they are given opportunities to work alongside other students and develop mathematics skills they may not feel comfortable using on their own. Johnson et al. (2022) found that

recognizing students mathematical strengths promotes positive engagement and participation in the learning environment. Johnson et al. (2022) also found that joint activities, including whole group and small group lessons, foster students' achievement and engagement in mathematics through collective work. When students are provided opportunities to engage positively in mathematics, teachers can increase students' engagement and achievement motivation.

Lack of achievement motivation results when students and teachers their desire to seek more understanding of mathematics content was not provided to them. Bharaj et al. (2023) suggested teachers' former classroom experiences in mathematics influence their beliefs in teaching the subject. Bharaj et al. (2023) reported that when teachers were students, if their instructors viewed asking and answering questions or interacting with other students as unimportant, then those teachers also view those instructional elements as not important. Kane and Saclarides (2023) found that teachers foster a learning environment by encouraging students in making sense of mathematics concepts through enriching collaborative discussions, sharing ideas, and constructing arguments about mathematics. Kane and Saclarides (2023) found that teachers who do not have the ability to allow for students to have these opportunities lack in mathematics content knowledge and are unlikely to offer these opportunities to students in the classroom. In addition, Santagata and Lee (2021) found that novice teachers find it difficult to engage in rigorous lessons and effective class discussion during their first years of teaching because of their struggle to learn curriculum material and standards. Research has found that both

students and teachers share similarities in their value of mathematics and expectancy for success in the mathematics classroom.

Teaching and learning expectancies for success in mathematics are linked to students' and teachers' understanding of the mathematics concepts taught. John et al. (2020) found that expectancy and values in mathematics are influenced by a person's past achievement outcomes in the classroom. Weber et al. (2020) found that expectancy for success in mathematics, belief in the value of mathematics, and support for achievement goals and actions affect students' proficiency outcomes in mathematics. Weber et al. (2020) also found that teaching and learning mathematics involve confronting challenges and developing skills through mathematics practice guided by a teacher who is knowledgeable about mathematics and can develop students' achievement motivation.

Summary and Conclusions

In this chapter I presented current literature that address the problem with mathematics preparation for students in the K–3 classroom and why K–3 mathematics instruction may not lead to mathematics proficiency of third grade students. The literature that I referenced in this chapter supported the exploration of teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. The literature that I presented also provided reasons why many students in third grade fail to demonstrate mathematics proficiency and suggested factors that may contribute to this problem. The conceptual framework of EVT, as described by Wigfield (1994), guided my exploration of the literature and demonstrated connections between elements of EVT

and K–3 teacher perspectives of children's ability-related expectations and values associated with mathematics achievement. In Chapter 3, I present an explanation of the research design and the procedures that I used to inform this study.

Chapter 3: Research Method

The purpose of this study was to explore teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. In this chapter I provide a rationale for choosing a qualitative research design, identify the role of the researcher, and describe the selected participants for this study. I discuss the instrumentation and procedures for participant recruitment. I conclude this chapter by addressing methods of maintaining trustworthiness and ethical procedures.

Research Design and Rationale

The research questions that I used to guide this study were:

Research Question 1 (RQ1): What are K–3 teachers' perspectives of children's task-associated expectations and values as they relate to the problem of lack of mathematics proficiency as measured by state assessments?

Research Question 2 (RQ2): What are the challenges K–3 teachers describe in supporting children's task-associated expectations and values as they relate to mathematics achievement?

The central concept of this study was teacher perspectives of their challenges in supporting kindergarten through third grade students in mathematics proficiency. I conducted a basic qualitative design using interviews for this study. According to Ravitch and Carl (2021), the qualitative researcher explores individuals' experiences and perceptions of the world through those individuals' own eyes. In contrast, quantitative research designs measure variables using numerical data; such a design was not selected

because this study is specifically about understanding the perspectives of teachers' experiences with students in the classroom (Ravitch & Carl, 2021). According to Ravitch and Carl (2021), a research design should be driven by the goals and guiding questions that are specific to the study. Interviews were selected to focus on individuals' lived experiences and perspectives as they relate to the phenomenon under study (Ravitch & Carl, 2021). In surveys, participants can only answer questions based on a selection of responses, while interviews allow the participant to elaborate on their responses to questions posed (Burkholder et al., 2020). Unlike surveys, in a qualitative interview, the interviewer and the participant can discuss a topic and have an open conversation about the questions asked (Babbie, 2017). I conducted this study to explore K–3 teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement, a qualitative research approach using interviews was selected.

Role of the Researcher

My role as the researcher in this study was a participant-observer. According to Rubin and Rubin (2012), during interviews participant-observers withdraw from participation in the interview to allow participants to share their experiences authentically while observing body language and similar non-verbal cues. As the researcher, I used the participant-observer role for this study because it allowed me to connect with participants through shared experiences (see Ravitch & Carl, 2021).

With 11 years of experience in teaching early childhood mathematics at the time of this study, I served as a third grade teacher in the public school system where I

conducted my study. As a participant-observer in this study, the possibility existed for bias from my own personal opinions about teacher perspectives with students who are challenged to demonstrate mathematics proficiency in the classroom. To guard against the possibility of bias and control my own thoughts, I used ten semistructured interview questions and followed up using clarifying questions based upon the information participants shared. Ravitch and Carl (2021) stated that semistructured interviews are widely used in qualitative research, providing a framework of questions and prompts to guide participants' responses. To further guard against bias, participants reviewed their interview transcripts to ensure fidelity of the recorded information. Although I was employed in the public school system that I conducted interviews in, I did not interview participants whom I knew; I did not supervise any teachers who volunteered to participate in this study.

Methodology

I conducted this qualitative study to gain insights into the central concept of teacher perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. In this section, I explain the selection of participants, instruments used to gather data, the procedures that were used to gather data from participants, and my data analysis plan. My qualitative analysis describes in detail the perspectives that participants in this study had regarding their challenges and experiences with supporting students in mathematics proficiency.

Participant Selection

I used purposeful sampling and recruited 12 K–3 elementary school teachers who had experience in teaching mathematics in a general education classroom. Purposeful sampling allows for individuals to be purposefully chosen to participate who understand the central concept in a study (Ravitch & Carl, 2021). The 12 teachers included in this study taught mathematics in a non-departmentalized general education classroom, and who have more than 2 years of experience in a public school setting. Excluded were teachers with less than 2 years of experience, teachers who teach in non-public settings, and those who teach non-academic subjects such as physical education, art, or music. Also excluded were teachers of special populations in exclusive classrooms such as gifted students, students with special needs, or students whose first language is not English. The recruitment flyer and consent form described the criteria for participants that I was looking for and at the start of each interview I confirmed with participants that they fit the criteria. The sampling criteria for this study included participants who taught mathematics in a public school setting for 2 or more years.

I planned to interview 10 to 12 teachers for this study based on the assumption that after at least 10 interviewers I would reach data saturation. According to DiStefano and Yang (2024), saturation is used in qualitative research as the main criterion for determining the number of participants and completeness of the data obtained. DiStefano and Yang (2024) found that for qualitative interviews the range should be between nine and 17 interviews to allow researchers to gather enough data to reach saturation. According to Rubin and Rubin (2012), once two interviews are conducted the researcher

should review the response and use the data as a guide for the remaining interviews. Data saturation is achieved when no further findings are revealed from participants (Rubin & Rubin, 2012). I interviewed a total of 12 participants and with those participants I reached data saturation.

I asked teachers to participate in this study using a recruitment flyer with a message stating for individuals who were interested in participating in the study to email me using the email included in the flyer. The recruitment flyer was posted on Facebook in a members only private Facebook group for teachers in a public school system serving a major metropolitan area in the eastern United States. As prospective participants responded through email, I thanked them for being interested in the study and responded with the consent form. Once the participants responded by emailing back stating that they consent to the consent form, I scheduled the interview at a mutually convenient day and time. After the interviews were scheduled I began interviewing the participants for my study.

Instrumentation

I used a set of ten semistructured interview questions (see Appendix) to help explore K-3 teachers' perspectives and challenges in supporting children's mathematics achievement. Rubin and Rubin (2012) stated that in qualitative interviews the interviewer should use open-ended questions and be sure that the questions are simply stated, avoiding jargon and confusing terms. Questions 1 and 2 inquired about K-3 teachers' perspectives on challenges students face in understanding mathematics and reasons teachers think some students might struggle in mathematics.

Question 3 inquired about teachers' experience with students' expectations regarding their ability to complete mathematics assignments successfully. The third question also posed follow up questions to gather details about students' expectations for success, the relationship between assignment type and expectations for success, and the effect of expectations for success on actual success. Participants were asked to describe the reaction of a struggling student to the experience of doing well on a mathematics task. Question 4 asked about teachers' understanding of student beliefs about their ability to do mathematics, which may reveal understanding of student mindset and experience with math anxiety. Follow up questions expanded on the issue of student beliefs. Questions 1 through 4 helped me answer the first research question about children's task-associated expectations and beliefs related to mathematics proficiency. Question 5 explored the second part of the first research question, regarding students' value for mathematics. Question 5, for example, asked about teachers' understanding of how valuable students think mathematics is, setting aside the possible goal of getting a good grade in mathematics, and focusing particularly on the value of mathematics to students who struggle with the subject.

Questions 6 and 7 inquired about teachers' actions in developing in students who struggle in mathematics an expectation for success and a belief in themselves with regards to mathematics success. Question 8 asked how teachers develop a perception of value for mathematics, without regard for its extrinsic assessment value. These questions addressed the second research question, about how teachers support EVT elements of expectation, belief, and value, in students who struggle in mathematics. Question 9

shifted the focus to the participants and explored their performance in mathematics based on their expectations, beliefs, and values in mathematics. The final question ended the interview with an invitation to say whatever else the participant wants to add. Ravitch and Carl (2021) stated that with qualitative interviews the focus is to gain insight into the individuals' lived experiences and perspectives. Overall, the interview questions allowed for teachers in grade levels K-3 to describe in detail their experiences and perspectives with students who have challenges in mathematics.

As the interviewer, I was another instrument for data collection because I conducted the interviews to determine the data to include in my analysis, and draw conclusions from the data, it was important that I avoided researcher bias and remain objective and accurate (see Rubin & Rubin, 2012). My goal was to ensure that the interview questions, audio-recorded notes, and transcriptions made from the interview were as objective and unbiased as possible. I asked the ten questions included in the interview question set, asked probing or other clarifying questions based upon the responses of the participants, and I avoided sharing my own experiences and opinions during the interview. Ravitch and Carl (2021) reported that in qualitative research validity relies on how well researchers can authenticate their findings and accurately reflect participants' experiences.

Procedures for Recruitment, Participation, and Data Collection

The procedures for conducting this qualitative study included first receiving approval (04-09-25-0609765) from Walden University Institutional Review Board (IRB). Then, I requested permission from the administrator of a members only private Facebook

group to post the recruitment flyer to group members, who are public school teachers working in the metropolitan area in the eastern United States that is the study location. Once I received approval from the administrator of the members only private Facebook group, I posted the recruitment flyer. The flyer instructed interested participants to use the link and QR code to access and review the consent form. Some of the participants who wished to continue replied to me via email stating their interest in the study, while other participants sent me a message on Facebook. I responded to all of the participants asking that they reviewed the consent form and emailed me with their consent to the study by stating, "I consent," as directed on the consent form. After receiving emailed consent, interviews were scheduled after work hours at times that accommodate the schedules of myself and the participant. I sent a reminder to participants one day prior to the scheduled interview. Participants were encouraged to engage in the interview from a quiet location with good internet access and in which they are unlikely to be disturbed. Interviews took about 15 to 46 minutes and were conducted over Zoom. Consent was confirmed by each participant prior to the interview and audio recording.

The scheduled interviews took place through Zoom from the privacy of my home living room. home to ensure that only recorded audio conversation consisted of myself and the participant. The audio recorded interview took place through Zoom on my laptop. I used a free recording application on my cell phone to record interviews in the event that the online recording malfunctions. There was no recording malfunction with Zoom during the interviews and I only needed to record the first two interviews using the free recording application to ensure that there were no malfunctions with the Zoom platform. I

began each interview by greeting the participant and introducing myself. A summary of the study was explained to participants and consent was requested again prior to the start of the audio recorded Zoom interview. During each interview I listened closely to the participants' responses and took handwritten notes to ensure that I was gathering enough information from them. I posed follow-up questions and probed for more information from the participants when needed. Rubin and Rubin (2012) stated that with probing and follow up questions the interviewer can ask for clarification for something that was said and gather more information from responses that may have been misunderstood from the interviewee. I ended each interview expressing my appreciation for the participant's involvement and informed them that I would send a copy of their interview transcript for review.

I transcribed each interview using Kaltura and, while listening to the audio recording, I made revisions if need to the interview transcript. Ravitch and Carl (2021) suggested that with qualitative interviews a researcher should review the interview transcript and notes to evaluate what was said and determine if changes should be made before conducting another interview. The interview transcripts were emailed to participants to check for accuracy or request changes. If any participant requested changes to be made I would have made the necessary changes, but no participants requested changes to be made to their transcripts.

Data Analysis Plan

I pasted each transcribed interview into an Excel spreadsheet to begin the coding process. Ravitch and Carl (2021) stated that one purpose of coding is data organization; coding supports the analysis by identifying patterns across multiple data points or sources. During my precoding stage I printed each transcript, read through them, and took notes on similarities and differences that I noticed from each interview. Ravitch and Carl (2021) stated that precoding enables the researcher to read, question, and engage with the data. The observations that I made during the precoding stage helped me with starting the coding process of highlighting commonalities with the phrases and experiences my participants shared.

In the first stage of coding I isolated individual portions of data that represented individual thoughts of the participant. The individual thoughts of the participants included a sentence or a narrative of several sentences. The verbatim snippets of data helped with forming codes. Next, I transferred these codes to a single column of an Excel spreadsheet, with each code on an individual row and with a participant identifier in an adjacent column on every row. Then, I grouped these codes into categories by identifying recurring ideas across codes. Saldaña (2021) stated that a category is often a short word or phrase that is noticeable and important information within the data collected.

In the Excel spreadsheet I created a column for categories and assigned each code to a category. In this way numerous codes in the data were grouped into 28 categories. Next, I grouped categories into six themes, to develop overarching ideas that describe the key points in the data. Ravitch and Carl (2021) suggested that this stage of data analysis

focuses on answering the research questions, so themes are identified with consideration for how the themes are associated with the research questions. A column for themes was created on the Excel spreadsheet so codes were grouped into categories based on similarities of ideas, and funneled into themes that encompass the diversity of codes that compose each theme. Saldaña (2021) stated that codes must relate to the research questions; however, the open-ended nature of qualitative research invites ideas the researcher may not have anticipated. All findings were organized into the six themes, so all key ideas that emerge from the data were captured.

Ravitch and Carl (2021) defined discrepant cases in qualitative research as data that describes disconfirming evidence, negative cases, or outliers. In qualitative research discrepant cases involve identifying data that are inconsistent with a particular pattern or the researcher's interpretation of the data. I followed the interview questions, asked probing questions, and refrained from injecting my own ideas into the interview conversation. The information shared from the participants did not challenge the findings of this study. I found that the information shared by participants fit into each category and theme to answer the research questions for this study. As I reviewed each transcript prior to coding I avoided researcher bias and used all of the data provided from the participants. Ravitch and Carl (2021) stated that, when analyzing discrepant cases, researchers should prioritize the participants' contributions rather than the researcher's interpretation of what is relevant.

Trustworthiness

Trustworthiness in qualitative research is crucial in assessing the research conducted and an important aspect of the researcher's transparency and credibility (Adler, 2022). The key to trustworthiness in a qualitative study is ensuring that the researcher provides transparency in their writing and justifies why procedures were selected and how they align to the study (Adler, 2022). The methods of trustworthiness discussed in this study included credibility, transferability, dependability, and confirmability.

Credibility

Credibility involves ensuring that the findings accurately capture the participants' perceptions and experiences (Urban & van Eeden-Moorefield, 2018). According to Ravitch and Carl (2021), qualitative researchers may strengthen credibility through strategies such internal validity and member checking. Internal validity ensures that the collected data accurately measure what the researcher intends to measure (Ravitch & Carl, 2021). A qualitative research practice used to confirm the accuracy of participants statements or interview transcripts is member checking (Ravitch & Carl, 2021). To establish credibility for my study, I recruited participants who meet the criteria until I reached data saturation. I was able to code all of the information related to teacher perspectives of why students have challenges with mathematics proficiency. I achieved credibility by reviewing the audio recorded transcripts at the end of each interview to ensure that the participants responses was recorded properly. I also achieved credibility

through member checking with my participants by having them review their transcripts to ensure that what they said was accurate and truthful.

Transferability

Transferability describes how findings can be applied by a reader to their own settings and populations (Urban & van Eeden-Moorefield, 2018). Transferability in qualitative research is established through true statements expressed in rich, thick descriptions that help a reader decide if a study's findings can be generalized to their particular setting (Ravitch & Carl, 2021). Thick description provides a basis for meaningful interpretation of study findings by research audiences (Ravitch & Carl, 2021). Thick description was achieved through the process in which data was collected, the setting of my study, and verbatim data from the interviews conducted for my study.

Dependability

Dependability refers to consistency in the findings in the study that support their replication in future studies (Urban & van Eeden-Moorefield, 2018). Ravitch and Carl (2021) stated that in qualitative research dependability is established by the triangulation and sequencing of methods chosen to collect data and answer the research questions. I achieved dependability in this study through describing my research process in detail so that I can support other researchers in replicating my study to achieve similar results. Dependability was also achieved through an audit trail, which included how and why the data was collected for recruitment, interviews, audio transcripts retrieval, and coding to help others evaluate the overall effectiveness of my study.

Confirmability

Confirmability refers to the researcher's recognition of their personal biases ensuring that such biases do not affect the outcomes of the research (Urban & van Eeden-Moorefield, 2018). Ravitch and Carl (2021) stated that confirmability supports qualitative research through acknowledging and exploring ways in which biases and prejudices might map the interpretation of data collected. As a mathematics teacher who teaches in the school system that was the focus of my study, I understood that I have my own personal perspective on the topic for this study. To guard against my personal bias and to control the intrusion of my own ideas, I followed the plan I had for interview questioning (see Appendix) and refrained from inserting my personal perspectives during the interview. I asked participants to review their interview transcript for accuracy before I began my data analysis. Confirmability was supported by ensuring that the data reflected in the study were from the K-3 experiences and perspectives with students who have challenges in mathematics and not my own.

Ethical Procedures

Prior to conducting research, I requested IRB permission to conduct my study. After obtaining IRB approval I emailed the administrator from the members only private Facebook group for permission to post the recruitment flyer to begin recruiting participants willing to participate in my study. After receiving written consent from willing participants, I conducted audio recorded interviews. I kept participants' identities and workplaces confidential. In all study documents, I referred to participants only by an

alphanumeric code. I did not discuss the study with anyone outside of my dissertation committee, nor share any raw data with another outside of the committee members.

All data collected from my study will be maintained in a secure, password protected folder on a computer accessible solely by me, for 5 years after the study ends. After 5 years have passed, I will wipe all digital files using Eraser™ or a similar tool and I will shred any paper notes or files used for the study.

Summary

In Chapter 3, I described my rationale for selecting a qualitative study, using interviews for data collection. I described my role as the researcher, the methodology in which I recruited participants, the procedures that I followed while conducting my study, and my data analysis plan. I concluded this chapter by describing how I achieved trustworthiness for my study and the ethical procedures that I followed. In Chapter 4, I present the results from the data collection and analysis.

Chapter 4: Results

The purpose of the study was to explore teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. In this study, I used two research questions to inquire about K–3 teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers described in supporting children's mathematics achievement. In this chapter, I begin by describing the setting in which data were collected. Next, I discuss the data collection and the analysis of the data collected including participants' responses to information that are relevant to this study. I conclude the chapter by presenting the results of the data analysis as they relate to the research questions and provide evidence of trustworthiness.

Setting

Data collection process took place during the end of the 2024-2025 school year. To my knowledge, participant experiences reported in this study were not affected by any personal or organizational conditions. The participants varied from teachers with 2 years of experience to teachers who had taught for 10 or more years. All participants who participated in the study were female. All grade levels kindergarten through third grade were represented in the teaching experience of participants. Demographic information is presented in Table 1.

Table 1

Participant Gender, Years of Experience, and Grade Levels Taught

Participant	Gender	Years Taught	Grade(s) Taught
P1	Female	4	K,3, 4
P2	Female	11	1
P3	Female	4	2,3,4
P4	Female	5	Pre-Kindergarten, K
P5	Female	10	1, 2, 4
P6	Female	20	1, 2, 3, 5
P7	Female	2	1
P8	Female	2	K, 1
P9	Female	2	2, 3
P10	Female	9	3, 4
P11	Female	10	1, 2, 3
P12	Female	6	3

I conducted interviews from the privacy of my home living room. Participants were encouraged to participate from a private space with good internet access where they were unlikely to be overheard or interrupted. Interviews were conducted outside of working hours for participants.

Data Collection

I collected interview data from 12 K–3 teachers, following the procedures described in Chapter 3. I conducted the audio recorded interviews through the Zoom platform in the time span of 6 weeks. The audio recording times varied from 15 minutes to 46 minutes. Prior to each interview, each participant was asked to sit in a quiet setting

to ensure there were little to no distractions or interruptions during the audio recording. Each participant was interviewed once.

After each interview was conducted the recording was saved and downloaded to my computer. I uploaded the audio recording of each interview into the Kaltura platform provided through Walden University. After the interview was uploaded into Kaltura, I downloaded the transcription of each interview to enter it into Microsoft Word for review. Each interview transcript was copied and pasted into Word files identifying the interviewer and interviewee's responses during the interview. Once each transcript was reviewed, I emailed it to the appropriate participant and invited them to review the transcript for accuracy. Participants were asked to review their transcript and email it back with changes that they believed were necessary. The participants did not make any changes to their transcription files, no changes were requested by any participant, so the final transcription files were used as the basis for data analysis.

Two participants had to reschedule their date and time before we conducted the interview. During the interviews, three out of 12 participants had interruptions that impacted no more than 2 minutes of the interview. Two participants had connection issues where their computers made a few noises. Another participant's doorbell made noises during the interview. Although these disruptions occurred during the audio recording, it did not appear to affect the responses of the participants.

Data Analysis

I followed the data analysis plan outlined in Chapter 3. I began the data analysis process by using the transcriptions of participant interviews and my observational notes

from highlighting commonalities to identify codes within the files. Saldaña (2021) suggested that in qualitative analysis, a code often involves assigning a brief word or phrase that captures the meaning of the data. I identified 445 codes. I conducted coding three time, during the observational process while collecting data, after developing thought units in Excel, and before creating categories.

Codes were grouped into 28 categories: attendance concerns, career changes, classroom and school environment, diverse learners, family beliefs, family expectations, grade level challenges, grade level supports, instructional lapses, instructional supports for mathematics, looping, mathematics assessments, parent and teacher collaboration, real world connections to mathematics, small group instruction, student ability levels, student beliefs, student expectations, student experiences in overcoming mathematics challenges, student mathematics challenges, teacher beliefs, teacher challenges, teacher classroom perceptions, teacher expectations, teacher motivation for students, teacher personal experiences with mathematics, teacher perspective and feelings, and teaching experience. The 28 categories then led to the development of six themes: classroom measures are in place to help students better understand the subject of mathematics, family influences are associated with students behaviors and success in mathematics, students' hold beliefs, experiences, and expectations associated with mathematics knowledge and ability levels, teacher beliefs and expectations associated with mathematics knowledge, teachers have expertise and knowledge regarding mathematics, and students' mathematics challenges affect their ability to achieve mathematics proficiency within grades K–3 .

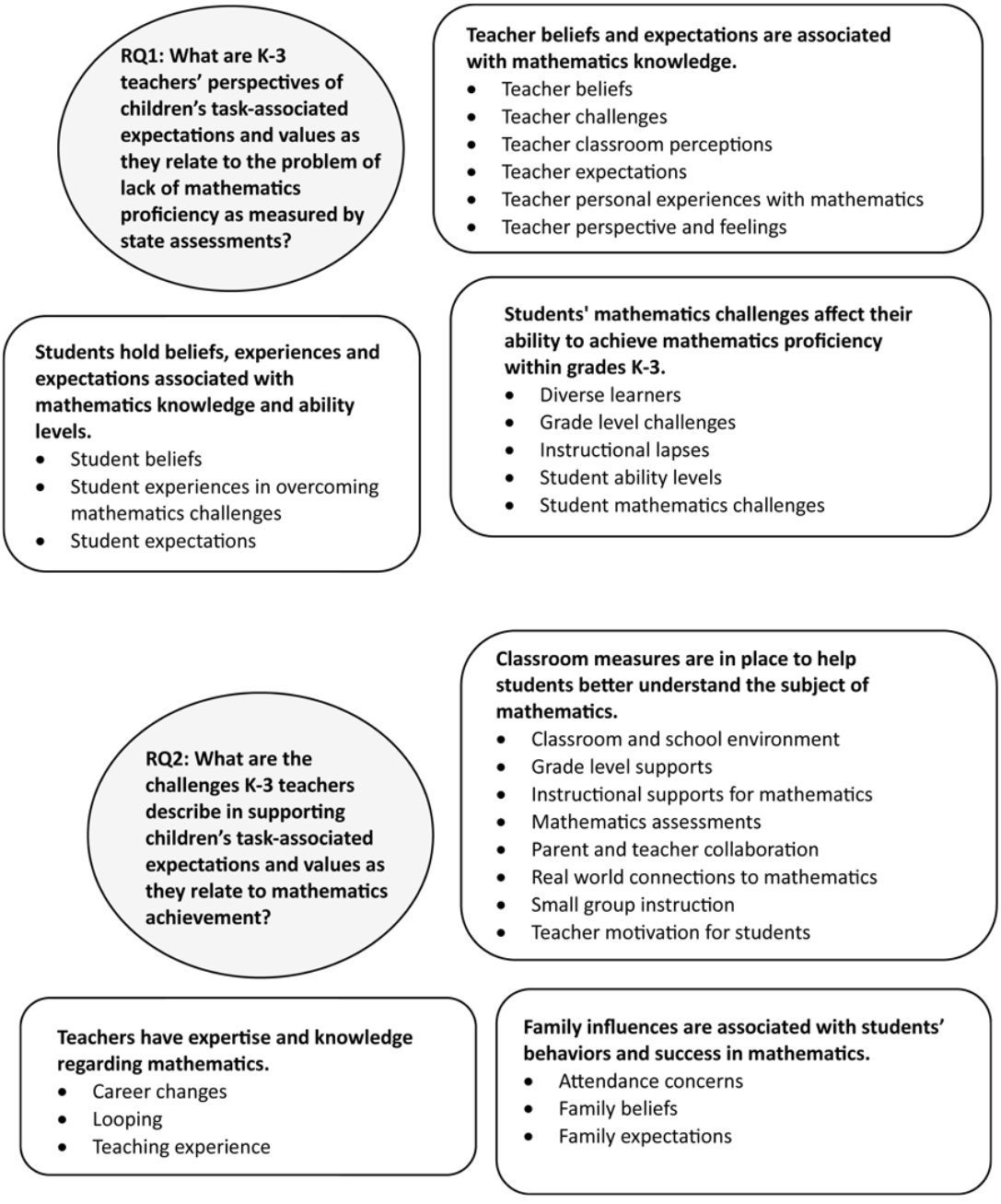
The categories that I assigned to each theme were based upon the similar words, phrases, and ideas shared from participants. The categories classroom and school environment, grade level supports, instructional supports for mathematics, mathematics assessments, parent and teacher collaboration, real world connections to mathematics, and small group instruction were assigned to theme classroom measures are in place to help students better understand the subject of mathematics. The categories, attendance concerns, family beliefs, and family expectations were assigned to theme family influences are associated with student behaviors and success in mathematics proficiency. The categories student beliefs, student experiences in overcoming mathematics challenges, and student expectations were assigned to theme students hold beliefs, experiences, and expectations associated with mathematics knowledge and ability levels. The categories teacher beliefs, teacher challenges, teacher classroom perceptions, teacher expectations, teacher personal experiences with mathematics, and teacher perspective and feelings were assigned to the theme teacher beliefs and expectations are associated with mathematics knowledge. The categories career changes, looping and teaching experience were assigned to theme teachers have expertise and knowledge regarding mathematics. The categories diverse learners, grade levels challenges, instructional lapses, student ability levels, and students mathematics challenges were assigned to the theme students' mathematics challenges affect their ability to achieve mathematics proficiency within grades K–3 .

The themes students hold beliefs, experiences, expectations associated with mathematics knowledge and ability levels, teacher beliefs and expectations are associated

with mathematics knowledge, and students' mathematics challenges affect their ability to achieve mathematics proficiency within grades K–3 were associated with RQ1, regarding teachers' perspectives of children's task-associated expectations and values in mathematics. The themes classroom measures are in place to help students better understand the subject of mathematics, family influences are associated with students' behaviors and success in mathematics proficiency, and teachers have expertise and knowledge regarding mathematics were associated with RQ2, regarding the challenges K–3 teachers describe in supporting children's task-associated expectations and values in mathematics. The relationships among categories, themes, and RQs are illustrated in Figure 1.

Figure 1

RQs with Associated Themes and Categories



In Chapter 3, discrepant cases were defined as cases that provided information inconsistent from the researchers interpretation of the data. I described my plan to limit

the instances of discrepant cases by following the interview questions outlined for my study, asking probing questions, and refraining from injecting my own ideas into the interview conversation. After reviewing both my interview questions, probing questions, and personal reflections, I found that the information shared by participants fit into each category and theme to answer the research questions for this study. The information shared from the participants suggested that they have similar perspectives from their experiences of working with K–3 students and their belief is that students do have challenges in mathematics proficiency within grades K–3 . I found no discrepant cases.

Results

In this section, I begin by stating the research questions chosen for this study and the themes associated with the RQs. Next, I discuss the findings from the data and participant responses relevant to each RQ. Then, I answer the RQs. Lastly, I conclude this section by stating additional findings from the data collected.

Results for RQ1

RQ1 was, “What are K–3 teachers’ perspectives of children’s task-associated expectations and values as they relate to the problem of lack of mathematics proficiency as measured by state assessments?” Themes that apply to this question included students' mathematics challenges affect their ability to achieve mathematics proficiency within grades K–3 , students hold beliefs, experiences and expectations associated with mathematics knowledge and ability levels, and teacher beliefs and expectations are associated with mathematics knowledge.

The first theme that emerged with regard to RQ1 was students' mathematics challenges affect their ability to achieve mathematics proficiency within grades K–3 . According to three of the participants, students have grade level challenges in mathematics that impact their understanding when working independently. P1 stated that, "Their challenges in understanding mathematics has been, I can say, word problems… reading the problem and … just taking their time to look at the problem and use the methods that were given to them." P2 agreed stating,

> One challenge is [students'] understanding the vocabulary and also that language barrier. I know math is the same and all numbers are the same across all languages but those newcomers that don't know any English and you're trying to teach them the content-specific vocabulary, and then even telling them the numbers, like us saying one, two, three, and they're thinking no, dos, tres. So that's one challenge.

P5 explained, "Reading the word problems have been a challenge for [students]." Difficulty with basic English literacy and framing problems mathematically presented ongoing problems for K–3 students.

Three of the participants shared that students have challenges with place value. P3 mentioned, "Once [the class] gets past the ones and tens understanding that there are ones inside of tens is a challenge for [students] to retain." P9 remarked, "I've taught second and third grade. Without that foundation of number sense, it's difficult for [students] to recognize quantities and understanding place value and just using the different strategies for just even addition and subtraction." P10 agreed stating, "When I was in third grade,

the biggest challenge that I had was place value. [Students] being able to understand what exactly the digits mean." Place value challenges were issues across grade levels K–3 and participants shared that not knowing place value negatively affects students from grade level to grade level.

Five of the participants shared that students have challenges with addition and subtraction. P1 stated that, "Many of the [students] had challenges with knowing how to even add and subtract on a number line." P4 suggested lack of familiarity with mathematics notation is a problem, saying, "Misconceptions with the addition and subtraction sign, as well as mixing up the symbols not really paying attention to the plus sign the minus sign." In addition, basic conceptual understanding was often faulty for students, as P6 described, "When [the class] were adding numbers to find the missing addend, [students] weren't able to figure out that if they just take the sum and subtract one of the addend, they could find the missing addend." Basic operations of addition and subtraction were often confusing for K–3 students, as indicated by P7, who said, "Subtraction is always a major concern," and by P8, who remarked, "I feel as though [students'] challenge is grasping the concept of addition within 20." Addition and subtraction challenges in grades K–3 is impacting students level of understanding mathematics and contributes to their lack of mathematics proficiency.

Another theme that emerged with regard to RQ1 is students hold beliefs, experiences and expectations associated with mathematics knowledge and ability levels. According to five of the participants, students' beliefs and expectations that shape their mindset on whether they will be successful in learning mathematics. P1 suggested,

“Students that are struggling in math do think that they should be successful.” P3 stated, “Students expect to do well in math: ‘If I put my name on the paper, then I deserve an A.’” P4 agreed stating, "Students’ level of confidence is not the highest and it is a very common feeling to feel when it comes to not understanding something.” P9 explained, “Students believe that math is a big component into their learning and some believe they are not good at math and can’t do math.” P12 also agreed saying, “Students’ expectations affects their success because if they do not have high expectations of themselves or know they will succeed in that subject they’re not going to put their best foot forward.” The participants responses described the mindset and expectations of the students they are teaching and how those mindsets are different based upon the students level of understanding what is expected of them in the classroom.

The third theme that emerged with regard to RQ1 is teachers described their beliefs and expectations associated with mathematics knowledge. According to six of the participants their expectations and beliefs can motivate students to be successful in mathematics. P4 said, “In order to have successful expectations for my students and for my classroom it includes {the teacher} being consistent and repeating those things multiple times if I have to.” P5 suggested, “Giving [students] a growth mindset in the beginning and entering every lesson allows for {students} to say, ‘I’m not worried about success or failing now and its okay.’” P6 agreed stating, “I want [students] to feel like they can do anything as long as they put their mind to it because they’re first grade and they’re just starting to get to do these skills.” P10 mentioned, “I have the expectation that they have to persevere because it will get hard. And that don’t mean you get to quit.” P7

suggested, “Math is something you have to keep working on and it’s not just something that can be done at school. It has to be done at home.” P11 agreed stating that, “Somehow I’ve made math fun and I know having an enthusiastic teacher when it comes to teaching makes it easier and doesn’t make it scary.” The participants shared similar responses to how children’s tasks, expectations, and values relate to the problem of students lacking mathematics proficiency.

The purpose of RQ1 was to provide similarities in responses from teachers’ perspectives as it related to the children’s tasks, expectations and values regarding mathematics proficiency. As a result of the data analysis, I found that teachers’ described mathematics skills such as grade level challenges, understanding of place value, and challenges with addition and subtraction as affects with student growth in mathematics. The students’ beliefs and expectations of success in mathematics is not based upon performance but their personal mindsets of how they believe mathematics tasks should be completed. The teachers’ beliefs and expectations suggest that they motivate their students to be successful in mathematics before tasks are given. The teachers’ perspectives suggest that students lack of mathematics proficiency is due to the challenges students have with grade level mathematics skills and lack of understanding how to complete grade level mathematics tasks on their own.

Results for RQ2

RQ2 was, “What are the challenges K-3 teachers describe in supporting children’s task-associated expectations and values as they relate to mathematics achievement?” Themes that apply to this question included, family influences are associated with student

behaviors and success in mathematics proficiency, classroom measures are in place to help students better understand the subject of mathematics, and teachers have expertise and knowledge regarding mathematics.

The first theme that emerged with regard to RQ2 was family influences are associated with student behaviors and success in mathematics proficiency. According to three of the participants concerns with students attending school can affect their progress in mathematics proficiency. P1 stated, “If [students] miss one day, if they miss two days in a row that’s instruction time that’s lost.” P2 added saying, “Students’ attendance can also affect their performance in math and create challenges.” P6 agreed stating, “Half of the students in class were ELD [English language development] students and there are a lot of attendance issues with them.”

Three of the participants shared that the beliefs and expectations families have can affect students’ views on being successful in mathematics. P6 mentioned, “Many of [the students] go home and say ‘mom, dad I need help with math,’ and [the parents] say ‘I’m not good at math, you’re not good at math so I can’t help you.’” P9 stated, “It’s not always the students expectations but it’s their parents’ expectations. Parents put much pressure on their students.” P11 agreed saying,

> It’s probably one of the biggest challenges I’ve had to deal with within the last two to three years of students just either not wanting to or have been told that they couldn’t do it by their parents or their caregivers of someone they look up to.

The expectation to succeed in mathematics does have affects on students in the classroom and teachers' can support families and students within the classroom by working alongside of them to motivate students to be successful in mathematics.

Another contributing theme to RQ2 was classroom measures are in place to help students better understand the subject of mathematics. According to five of the participants, in the classroom instructional supports are needed to increase students' understanding of the mathematics content taught. P1 said, "With young children they need graphic organizers, manipulatives, cubes, and counters. They need the numbers in front of them." P2 agreed saying,

> When we are working on an addition word problem I will ask students to show how they got their answer and because some students struggle, I have to reread the problem and they'll just look it at it and not even try. I try to reiterate the different strategies they can use to help them.

P3 explained, "On Mondays we use math hospital Mondays to go through step by step, the correct way to get the answers to tasks completed in the classroom." P7 shared,

> One thing that I do now is I'll have another student model what the correct answer would be and then have the other student repeat what that student did and then see if they are able to get the same concept.

P9 mentioned, "I try my hardest to differentiate the tasks. Instead of having students complete the front and back of a worksheet we might complete one page to get the concept." Participants shared various classroom measures and different supports for promoting students' mathematics learning.

Four of the participants shared that many of the students in their classrooms are in need small group instruction to better grasp mathematics skills and strategies taught in whole group instruction. P1 stated,

> The teacher is continually reinforcing what students have learned by bringing them into a small group and providing manipulatives because students learn in different ways. Some will learn by touching items, some will learn by just hearing audio, some will learn by visualization and some need a demonstration. In small groups I may have 15 or 20 minutes because I need to move on to the next group.

P2 agreed saying, "When I am working in small groups, I am working with the students who are struggling. I have them pick a strategy to work on and walk them through the problem and guide them." P6 mentioned, "A small group are for students still struggling. They need to see more of how it is done and then it might get a little easier for them to grasp the concept." P8 shared, "In small group instruction, I use that as a time to be more informal with students. In a group of three or four students they tend to be more relaxed and open to show their math thinking." These four participants shared similar views of how small group instruction is needed to support students who are challenged with learning and understanding mathematics.

The third theme that emerged with regard to RQ2 was teachers have expertise and knowledge regarding mathematics. The 12 participants in this study had different teaching experiences and journeys which contributed to how they teach mathematics. P1 shared, "I am a career changer so with paper I can push it to the side and not be concerned but I can't do this with students." P9 also shared, "I think that my view from

outside of not being a classically trained educator gives me a better grasp on math." P10 mentioned,

I still have more growing to do, especially continuing to move up grade levels from third, to fourth, to fifth. I learned third and fourth grade standards, now fifth grade standards. I feel like I'll be unstoppable.

P11 explained that,

> When I first started teaching in second grade we had a curriculum but not a scripted curriculum. When I switched to third grade I was learning a new curriculum then there was a pandemic. Then I got switched to first grade and I was learning a whole new curriculum again. So even though I've been in different grade levels I can see what they are supposed to learn in first grade and what I'm teaching in second grade how it will impact them in third grade.

While these four participants experiences were different, their understanding of learning the mathematics curriculum that needs to be taught to students were similar.

The purpose of RQ2 was to explore the challenges K–3 teachers described when supporting students in the classroom based upon the experiences they shared related to mathematics achievement. As a result of the data analysis, I found that K–3 teachers are challenged by attendance concerns, families personal beliefs and expectations about mathematics, the need for instructional supports and small group instruction, and teachers' experiences of teaching mathematics. The challenges that these teachers experience in the classroom does include the fact that students' understanding and progression in mathematics are based upon the instruction previously delivered and on

how much time students spend demonstrating their understanding of the skills learned. Students that miss instructional days from school does show impacts their growth in the classroom. According to the teachers within in this study, students may fear they will never understand the content taught based upon their families' perception and beliefs surrounding mathematics. Students may need daily small group instruction which requires the teacher to work alongside them to better understand the material taught. The teachers described a wide range of challenges that interferes with their ability to increase students' mathematics ability.

Summary of Results

In this chapter, I provided the findings from the data collected and participant responses that were relevant to RQ1 and RQ2. For RQ1, I provided similarities from the teachers' perspectives as they related to the children's tasks, expectations, and values regarding mathematics proficiency. The teachers found that students lack mathematics proficiency because they do not completely understand grade level mathematics skills and they lack the knowledge needed to complete mathematics tasks on their own. For RQ2, I explored the challenges K–3 teachers described when supporting students in the classroom based upon the experiences they shared related to mathematics achievement. The teachers described a wide range of challenges they faced that interfered with their ability to increase students' mathematics ability, including students' chronic absences, students' beliefs' and expectations with their ability to complete mathematics tasks, and the individual support students needed to work on grade level content skills and strategies in the K–3 classroom.

Evidence of Trustworthiness

As stated in Chapter 3, credibility is established through interval validity and member checking (Ravitch & Carl, 2021). Credibility was established by recruiting participants until data saturation occurred. I also established credibility by providing participants with a copy of their transcription file to review for accuracy. The participants did not make any changes to their transcription files, which suggested that they believed what they said was accurate and truthful. To maintain credibility, data analysis continued until saturation was achieved and data were verified through member checking.

In qualitative research, transferability is established through true statements expressed in rich, thick descriptions and the thick description provides a basis for meaningful interpretation of study findings by research audiences (Ravitch & Carl, 2021). Therefore, to support transferability in my data, I provided a thick description of the intended participants, the process in which the data was collected, the setting of my study, and verbatim data from the interviews conducted for my study. Transferability was achieved through sharing the intended participants used in this study, the process in which the data was collected, detailed descriptions of the setting of the study and utilizing the same interview protocol which included interview questions and probes for each participant.

To establish dependability, data collection and research questions were supported through triangulation and sequencing methods (see Ravitch & Carl, 2021). Dependability was established by discussing my research process in detail for other researchers who plan to conduct the same study and achieve similar results. Dependability was also

established by providing a rationale for the data collected through an audit trail including recruitment, interviews, audio transcriptions, and coding process. I achieved dependability in this study through the detailed research process and discussing the audit trail process which answered and addressed the RQs in this study.

Confirmability requires acknowledging and addressing potential researcher biases and preconceptions that could affect the interpretation of the data (Ravitch & Carl, 2021). To establish confirmability, I followed the interview questions and probing questions to limit bias and control the insertion of my own thoughts in the interviews and in my interpretation of the data. To ensure accuracy, participants were given the opportunity to review their interview transcripts before I began data analysis. I supported confirmability while writing the results, by using the interview transcripts and participants' own words to report K–3 teachers' experiences and perspectives with students who have challenges in mathematics.

Summary

In Chapter 4, I began by describing the setting in which the data was collected and the demographics of the participants. I described in detail the data collection process and participants responses to information that was relevant to this study. The data led to identifying 445 codes which then led to the development of 28 categories that subsequently led to the development of six themes: classroom measures are in place to help students better understand the subject of mathematics, family influences are associated with students behaviors and success in mathematics, students' hold beliefs, experiences, and expectations associated with mathematics knowledge and ability levels,

teacher beliefs and expectations associated with mathematics knowledge, teachers have expertise and knowledge regarding mathematics, and students' mathematics challenges affect their ability to achieve mathematics proficiency within grades K–3 . I concluded this section by discussing the results of the data analysis as it related to the research questions and provided evidence of trustworthiness. Results suggested that students have ongoing issues with mathematics proficiency and teachers are challenged with helping K–3 students make successful progress in mathematics because of their lack of understanding with grade level mathematics skills. In the remaining chapter, I will summarize the findings, discuss recommendations, and describe the potential impact for positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to explore teachers' perspectives of children's ability-related expectations and values as they relate to mastery of mathematics and the challenges teachers describe in supporting children's mathematics achievement. I interviewed 12 K–3 teachers following a basic qualitative design. This study was conducted because mathematics preparation in the K–3 classroom does not led to mathematics proficiency of third grade students as measured by state assessments. In this chapter, I interpret the findings, describe limitations of the study, make recommendations for future research, and discuss implications for practice and social change.

Interpretation of Findings

One key finding in this study was that students have challenges in the K–3 classroom which negatively affects their growth in mathematics; one of the main identified challenges involved word problems. Participants in this study shared that students whose home language was not English had difficulty reading on grade level and experienced challenges understanding the mathematics vocabulary within the word problems. Participants also shared that many other students had challenges completing step by step word problems. Similar to those of Yap and Wong (2024), these findings indicated that students often find mathematics word problems as challenging and require them to identify and apply the necessary procedures to solve them. Another challenge was students were not retaining mathematics skills and strategies taught in previous years, including addition, subtraction, and place value. Participants shared that after reviewing graded grade level tasks and class assessment data they found that students had

difficulties building upon previous learned skills and strategies. The literature in Chapter 2 did not specify that retention of mathematics skills and strategies was a challenge for students, but it did explain how mathematics proficiency is measured in the K–3 classroom. Clarke et al. (2023) found that students' mathematics performance in elementary school is shaped by what they were taught in previous grades. Lee (2024) shared that a child's mastery of mathematics skills is measured by the teacher's instructional objectives based on the curriculum being taught throughout the primary grades.

Another key finding was that students' beliefs and expectations regarding mathematics affected their expectations for success in learning mathematics. Participants in this study shared how some students in the K–3 classrooms believed they were good at mathematics until they received graded assignments and in class assessment scores that stated they completed the tasks incorrectly. Participants shared that after students realized that they misunderstood how to complete the mathematics tasks they would begin to hesitate to complete future tasks, ask for support before beginning a task on their own, look defeated by putting their heads down, or rush to complete the given task just to turn it in. This finding is similar to the work of Weber et al. (2020), who found that expectancy for success in mathematics, belief in the value of mathematics, and support for achievement goals and actions together influence students' outcomes in mathematics. Wigfield and Eccles (2020) found that children's value for a mathematics task changes when they are less competent and they begin to value those activities less. The results of my study revealed that participants believed that students beliefs and expectations are

shaped by their feelings toward task completion . Literature suggested that the value of the task for a child can change depending on if they feel confident or not in completing the task.

The third key finding was that teachers' beliefs and confidence levels in mathematics affected their delivery of instruction to their students. I found that participants in this study had different beliefs regarding mathematics: some were intimidated by mathematics growing up and others loved math. I also found that participants in this study were confident in teaching mathematics to their students and wanted to make their engaging for their students because they knew mathematics was a subject all students needed to understand in school. This finding is similar to the findings of Hunt et al. (2023), who suggested that teacher beliefs and level of confidence in delivering instruction can affect the extent to which mathematics is taught in the classroom using new strategies and techniques. Pyne et al. (2024) also stated that teachers influence the students they teach and understanding teachers' knowledge, beliefs, and attitudes can offer insight into how students learn in the classroom. The literature and my findings were similar and suggested that teachers' beliefs and confidence levels did indeed have an effect on how they delivered instruction to their students. The participants in this study wanted to incorporate engaging lessons in their classrooms and shared high confidence in teaching mathematics, regardless of the experiences they had in their own personal schooling or previous experiences of teaching mathematics.

The fourth key finding in this study was that the teachers' were using some sort of motivation in their classrooms to help students embrace mathematics challenges and

strive for success when completing grade level tasks. For example, teachers in this study described how motivating a student before working independent tasks helped students believe that they could complete the task even if it challenged them or seemed difficult to complete on their own. This finding is similar to the findings of Finn et al. (2023), who reported that achievement motivation is related to academic experiences that are enjoyable and engaging. McNeill and Polly (2023) also found that it is important to develop a child's growth mindset and perception to influence their self-efficacy in mathematics instruction. Similar to information presented in the literature, participants in this study found that by motivating students through affirmations, teaching them to have a growth mindset, and celebrating student successes in the classroom, their students became more confident in completing daily mathematics tasks.

Finally, the key finding in this study was that math anxiety was not specified as a factor that interfered with students' success and development in mathematics. I found that participants viewed students' success and development in mathematics was impacted due to misunderstanding and mathematics challenges. This is in contrast to the findings reported in the literature. For example, Lu et al. (2021) found that math anxiety in children in first through third grades contributed to their perceptions of themselves as less competent in mathematics. Schaeffer et al. (2020) also suggested that fear and apprehension regarding mathematics, lower levels of performance, and less engagement in mathematics can be due to students' math anxiety. Most of the research in suggested that math anxiety should have been a factor in students' academic development in mathematics. The participants in this study shared that students' success and development

in mathematics were affected more by their lack of understanding of grade level skills and of strategies taught in mathematics.

Overall, I found that the key findings from participants responses and literature had similarities to the conceptual framework of this study which was the work of Wigfield (1994). Wigfield (1994) suggested that expectancies for success in children rely on their performance in a task and whether they will succeed or fail. The findings of this study revealed that teachers recognized their students grade level challenges in mathematics and put measures in place to help students with their lack of mathematics proficiency. The findings of this study also revealed that teachers use motivation to help students change their beliefs and expectations in the challenges they have in completing grade level tasks. The participants in this study used motivation as a tool to help their students work towards being more successful with grade level tasks. Results of this study supported the framework of Wigfield (1994) by identifying that, although students have challenges in the K-3 classroom, with support and motivation their perceptions and challenges in mathematics can be increased.

Limitations of the Study

As mentioned in Chapter 1, limitations of this study included the possibility of incomplete testing due to the COVID-19 pandemic and the ongoing concerns with transmissible diseases. The limitation of incomplete testing data was not mentioned by teachers as a concern but inconsistent attendance in school was mentioned as something that negatively affected students' ability to complete mathematics tasks successfully. The information collected from this study was limited to conducting interviews through Zoom

instead of in person because of concerns of transmissible diseases. Prior to conducting interviews, I asked participants to find a private setting to reduce background noise and ensure accurate transcription. Six out of the 12 participants had background noises and interruptions during the interview, but these disruptions did not affect the responses of the participants and later were resolved through careful editing of transcripts. The possible limitations did not impact my ability to ask questions or the quality of the findings for this study.

Recommendations

Based on the findings of this study, I recommend that teachers of elementary and middle school grades 4 through 8 also be interviewed to determine if they find similar levels of expectancy for success among older students. Further research into mathematics challenges at upper grade levels could identify cumulative effects of issues evident in the primary grades. Additional research into mathematics challenges in other grade levels, teachers who teach mathematics could develop changes within their practice to support students' expectancy for mathematics success and valuing of mathematics.

Participants did not reveal that math anxiety was a concern for K–3 students, although math anxiety was evident in the literature. I recommend further study at the primary grades to explore this disconnect between my data from the literature. Additional studies could explore how math anxiety affects students' scores on state assessments, and discover if teachers in this study were able to reduce math anxiety to undetectable levels in their classrooms, but their students were still vulnerable to math anxiety in testing situations. This study should be replicated with a larger sample or in a different

geographic region, to verify that math anxiety is not an issue with young students. Further research into identifying the role of math anxiety with students in upper grade levels may determine if math anxiety increases as the complexity and abstraction of mathematics concepts increases.

Implications

The implications for practice that derived from this study include implications for primary grade teachers and elementary school administrators. One implication that I suggest is that teachers should incorporate end of lesson evaluations to evaluate students' feelings, understandings, and possible mathematics challenges once they have completed grade level tasks. Teachers in this study mentioned that students' beliefs and expectations of success in mathematics was not based upon performance but their personal mindsets of what they believe should be shown and completed when completing mathematics tasks. Therefore, I suggest that primary grade teachers should develop practices to evaluate students' feelings and understanding of mathematics task after they have completed them. The evaluation should help teachers create measurable goals with students to address how they felt about the tasks they completed and address skills students still have challenges with completing on their own.

The next implication for practice for primary grade teachers is to use motivation as a tool to help students believe that they can complete challenging mathematics tasks. Teachers in this study believed that motivation helped students in their classrooms be more successful in the mathematics tasks given in class. Primary grade teachers should implement practices to motivate their students to build their confidence levels and

mindset to be successful in completing mathematics tasks that are challenging or seem difficult to complete. Teachers in this study also suggested that by motivating students through affirmations, teaching them to have a growth mindset, and celebrating student successes in the classroom, students were more confident in completing challenging tasks. Therefore, I suggest that by using motivation as a tool in the primary classroom students will be motivated to completing challenging tasks on their own.

The third implication for primary teachers will be to create a partnership with families and begin including them in the mathematics lessons. Teachers in this study stated that families had an influence with students' behaviors and success in mathematics proficiency. Primary teachers can incorporate in school activities that allow families to work alongside of their children and participate in mathematics lessons that the students are learning. Therefore, when families and students work together they can motivate students to be successful in mathematics because they will understand how to complete the mathematics tasks that students are working on in the classroom.

An implication for elementary school administrators is to provide teachers with one to one student manipulatives so that every student has a set of manipulatives to assist them when completing grade level tasks. Teachers in this study stated that young children need manipulatives including cubes and counters to support their understanding of the mathematics tasks that needed to be completed. School administrators can provide manipulatives for mathematics teachers so every student has the tools they need to complete grade level tasks.

Another implication for elementary school administrators is to create a block of time during the instructional day that is uninterrupted for small group instruction. Teachers in this study stated that small group instructional time was beneficial to students because it provided students with the opportunity to pick a strategy to work on and receive guidance with completing that strategy. Small group instructional time allows for teachers to work with students who are having challenges or need extensions to mathematics lessons. Therefore, I suggest that by incorporating uninterrupted instructional time during the day for small group instruction can provide students with opportunities to ask questions for clarify on mathematics tasks that they may not understand how to complete on their own.

The results of this study can provide primary school teachers and elementary school administrators with practical ways to increase students' beliefs and expectations in mathematics. Positive social change may result when teachers' perspectives of students' mathematics challenges are understood and administrators support teachers in using motivation to help students achieve mathematics proficiency. Another positive social change result would include early school administrators using the above changes to provide teachers with specific requests to help support students in mathematics. Overall the implications shared above should support both primary school teachers and early elementary school administrators with helping students increase their mathematics proficiency in the K–3 classroom.

Conclusion

The problem that I sought to address in this study was that mathematics preparation for students in kindergarten through third grade does not lead to mathematics proficiency of third grade students as measured by state assessments. This study was designed to explore teachers' perspectives of children's ability related expectations and values as it related to their mastery of mathematics and the challenges teachers described in supporting children's mathematics achievement. The conceptual framework used in this study was based in the work of Wigfield (1994), stating that people are motivated to complete tasks at expected levels of achievement when they believe that they will do well. To investigate this issue, I interviewed twelve K–3 teachers using Zoom with interview questions that explored their perspectives and challenges in supporting children's mathematics achievement. From this study I found that the mathematics preparation for students in the K–3 classroom does not lead to mathematics proficiency of third grade students as measured by state assessments. As I explored teachers' perspectives of children's ability related expectations and values I found that students' success in mathematics is affected by their beliefs and expectations. I also found that the beliefs and expectations that students have can be changed to increase students' belief in their understanding of mathematics. During my interviews I found that while teachers were describing the challenges they had in supporting students' with mathematics achievement, they also detailed how they used their own personal motivational tools to support students with building their confidence and understanding in mathematics. Teachers should implement the practices and suggestions outlined in this study to begin

increasing students mathematics proficiency in the K–3 classroom. K–3 teachers should use this study to begin evaluating their current teaching practices to incorporate new practices to help students see the value of mathematics and begin to work towards increasing their mathematics proficiency before taking state assessments. Therefore, positive social change may result when teachers' perspectives of students' mathematics challenges are understood and administrators support teachers in using motivation to help students achieve mathematics proficiency.

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Appendix: Interview Questions

Think about the students that you currently teach or have previously taught. What have been their challenges in understanding mathematics?

Tell me more about that….

What do you think are the reasons some children struggle in mathematics?

Any more?...

What has been your experience with students' expectations on their ability to complete mathematics assignments successfully?

Do students who struggle in math often *expect* to do well, do you think?

Are there some math assignments for which even struggling math students have high expectations for success? [which ones? Why?]

How do students' expectations for success affect their success in math?

Tell me about a time when a struggling student did really well on a math task - what was their reaction to that?

Beliefs about yourself are a bit different from expectations for a particular task, right? What has been your experience with students' *beliefs* about their ability to do math?

What beliefs about themselves do students who struggle in math tend to have?

Where do you think these beliefs come from?

Tell me about a time when a struggling student did not do well at all on a math task - what was their reaction?

How valuable do students in your class think math is?

Do students who struggle in math think math is important to them?

Except for just getting good grades or passing a test, what makes math valuable to students in your class?

What do you do as a teacher to develop *expectations* for success in students who struggle in math?

How do you as a teacher develop a student's *belief* in themselves, especially regarding math?

What do you do as a teacher to make learning math seem *valuable* to students, besides its value in getting a good grade?

Let's shift gears a bit. Think about your own experiences with math. Do you see yourself as someone who is good at math and expects to be successful in a math class?

Did you enjoy math classes in high school and college? Tell me about that….

What do you believe about yourself, with regards to being able to solve math problems?

Do you see yourself as a good math teacher? [Tell me more about that…]

What else can you tell me about struggling students and math or your own experiences with math?