2-12-2024

Educators’ Perspectives of How to Support Mathematics Achievement of Grade 3 Through Grade 5 At-Risk Students

Shanerron Fordham-Knox
Walden University

Walden University

College of Education and Human Sciences

This is to certify that the doctoral study by

Shanerron O. Fordham-Knox

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.

Review Committee
Dr. Cathryn Walker, Committee Chairperson, Education Faculty
Dr. Ryan Theroux, Committee Member, Education Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
February 2024

Abstract

Educators' Perspectives of How to Support Mathematics Achievement of Grade 3 Through Grade 5 At-Risk Students

by

Shanerron O. Fordham-Knox

EDs, Walden University, 2018

MA, Walden University, 2014

BS, Springfield College, 2011

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Education: Curriculum, Instruction, and Assessment

Walden University

February 2024

Abstract

The problem addressed in this study was that teachers are struggling to support the instructional needs of at-risk students Grades 3–5 in mathematics in a Southern state. The purpose of this basic qualitative study was to explore the perspectives of Grades 3–5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students in Grades 3–5. Bruner’s theory on the stages of representation informed this study. The research questions focused on Elementary teachers' perspectives and recommendations of instructional supports and approaches to support the mathematics achievement of at-risk students in Grades 3–5. Data were collected via semistructured interviews with 10 participants who met the criteria of (a) being certified educators with experience teaching mathematics in Grades 3–5, (b) having experience teaching mathematics to students who failed to meet the state mathematics proficiency assessment, and (c) having experience teaching mathematics to at-risk student populations. Data analysis involved using a Priori and open coding to identify codes, categories, and themes. The emergent themes were (a) using varied instructional approaches, strategies, and grouping, (b) knowing the student, and involving parents, (c) struggling with class size, supports, resources, and professional development, (PD), and (d) recommending additional resources including funding, time, staff, and professional development. The findings may inform stakeholders about the needs of Elementary teachers in the study state. The findings may inform stakeholders about the needs of Elementary teachers in the study state. With this knowledge, stakeholders may be able to provide the needed supports, resources and PD to strengthen mathematics instruction thereby potentially promoting student achievement and positive social change.

Educators’ Perspectives of How to Support Mathematics Achievement of At-Risk

Students in Grade 3 Through Grade 5

by

Shanerron O. Fordham-Knox

EDs, Walden University, 2018

MA, Walden University, 2014

BS, Springfield College, 2011

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Education: Curriculum, Instruction, and Assessment

Walden University

February 2024

Dedication

I dedicate this study to my husband, Phillip Knox II and our children, Phillip Knox III and Destinee Knox. To my husband, thank you for your support and encouragement. Your sentiments serve as a steady reminder for me to embrace and be unwavering in my abilities. Thank you for encouraging my dreams as I reach beyond the stars. To my children, your love, support, and encouragement give me strength to continue reaching for my dreams. You both are now and will always be my greatest joy, fulfillment, and accomplishments.

Acknowledgments

I would like to thank God for his love, guidance, and strength. I would also like to thank my husband and children for their support, patience, and encouragement.

I would like to acknowledge my parents, James Fordham Sr. and Rhonda Rachelle Fordham, for their examples of hard work and pearls of wisdom and my siblings for their protection, guidance, and love. I would like to express a special appreciation for two of my older siblings, Tonisha and Trevon. Tonisha, you inspire me to always be the best version of myself. Your presence has and will always be felt in every phase of my life. Trevon, you have always been and will always be a hero I look up to. To my nieces and nephews, thank you for loving me as fiercely, sincerely, and humbling as you do.

I would also like to thank my friends for their support, time, expertise, and encouragement. I am grateful beyond words to my chair, Dr. Cathryn Walker and second committee member, Dr. Ryan Theroux, for their guidance, countless hours of support, understanding, and unwavering commitment to help me achieve my goals. I would also like to acknowledge the participants in this study for their time, dedication, and commitment to the teaching profession. Each and every one of you helped make my doctorate degree a reality.

Lastly, I would like to acknowledge teachers for their hard work, commitment, dedication, and passion. I truly believe teachers are the pathway that enables all careers and are a key foundational component to society. A special thanks to Karen Stewart, my high school English teacher, for her thoughtfulness, kindness, actions, and compassion. She ignited the passion and desire within me to teach. When I think of the reason I chose a lifelong journey with education, I think of Mrs. Stewart.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Elementary teachers are struggling to support the instructional needs of at-risk students in Grades 3 through Grade 5 in mathematics in a Southern state. Students who are at-risk in mathematics are observed to have persistent mathematics difficulties. The factors that have been identified to put students at-risk in mathematics are: (a) children from low socioeconomic (SES) backgrounds (b) students with cognitive or developmental delays; (c) students with vocabulary difficulties; (d) students demonstrating difficulties in reading, inattention, or other learning-related deficits, identified disabilities, learning-related behavior problems; or (e) students who have been retained (Morgan et al., 2016). Students who experience these factors will have persistent mathematics difficulties and are therefore considered at-risk for school failure.

The mathematics abilities of students are vital for the economic success of a society, as well as the scientific and technological advancement and growth of countries (Mazana et al., 2019). Researchers have tried to identify reasons why at-risk students fail to reach proficiency on state standardized tests, as they investigated math anxiety, preservice teacher training, and instructional mathematics needs for students in early elementary grades. Mazana et al. (2019) conducted a quantitative study to explore student's attitudes toward mathematics and mathematics achievement. Mazana et al. (2019) concluded, 80% of student participants exhibited positive attitudes toward mathematics; however, the majority of students were still receiving failing scores on mathematic assessments. Mazana et al. (2019) suggested the discrepancy in students' attitudes and student achievement levels could be attributed to the teachers' instructional strategies and delivery of the lessons pertaining to mathematics. Baten et al. (2020) suggested teachers found it more difficult to motivate and continually challenge students in the subject of mathematics due to struggling to find and maintain the optimal difficulty level that challenges students without leading to prolonged frustration for the students. Additionally, Baten et al. (2020) believed mathematics posed challenges for students who were poor performers and students with disabilities (SWDs), to learn due to the level of difficulty that mathematics topics were taught. An analysis of the literature on this topic has provided limited accounts of qualitative studies that explored teacher perspectives on instructional supports and approaches to support the mathematical instructional needs of at-risk students Grade 3 through Grade 5.

Background

Researchers have established that mathematics has been challenging for at-risk students (Hentges et al., 2019). At-risk is defined as "students who are at-risk for school failure and include other attributes such as low (SES), low student achievement, qualifying as English Language Learners (Els), or SWDs" (Slavin & Madden, 1989, p. 5). Slavin et al. (1989) further noted the "practical criterion for identifying students at-risk is eligibility for Chapter 1 (Title 1), special education, or other remedial services…" (p. 1). Students may also be considered at-risk because they "speak a language other than English" (Slavin et al., 1989, p. 5). According to Norval (2019), the linguistic demands of mathematics pose a challenge for ELs and can impede their academic abilities. As such, ELs have performed significantly lower in mathematics than their English-speaking peer counter parts (Norval, 2019). Researchers found there was an academic gap in performance on state assessments between SWDs and students without disabilities (Norval, 2019). SWDs may face cognitive, physical, or emotional challenges that result in students struggling to access the general education curriculum, despite the use of accommodations and modifications and alternative placement settings (Gilmour et al., 2019). Collins (2018) used a psychological approach to examine the characteristics of at-risk students and found that this population of students have been identified as those who may have learning disabilities, emotional and behavior disorders, have had limited economic opportunities, or living in poverty, and students identified as ELs. Consequently, at-risk students are more prone to obtain lower mathematics scores on standardized tests than students who are not at-risk.

Problem Statement

The problem is that teachers are struggling to support the instructional needs of at-risk students in Grade 3 through Grade 5 in mathematics in a Southern state. The Federal Government releases data every 2 years using The Nation's Report Card database (2017). The data released from 2017 showed that on state standardized tests, 23 states were performing below the national public in the subject of mathematics (The Nation's Report Card, 2017). These data from 2019 showed 28 states were performing below the national public in the subject of mathematics on state student standardized test (The Nation's Report Card, 2019). These data from 2022 showed 24 states were performing below the national public in the subject of mathematics on state student standardized test (The Nation's Report Card, 2023). Thus, nationally, there is a problem with student performance on mathematics standardized assessments. The problem of not performing proficiently on the mathematics state assessment is also reflected in a Southern state. Table 1 shows the data of a Southern state for 2016–2022 for all students Grade 3 through Grade 5 who did not meet the state proficiency for state administered standardized tests in mathematics. In a Southern state, between 2016–2022 approximately 46% to 65% of the students in Grade 3 through Grade 5 did not demonstrate proficiency on the state mathematics assessment.

Table 1

State Standardized Mathematics Assessment for At-Risk Students 2016–2022

2016–2022 Statewide Scores for At-Risk Students Grade 3 Through Grade 5 Not Demonstrating Proficiency on State Standardized Mathematics Assessment			
Year	Grade 3	Grade 4	Grade 5
2016–2017	55.7%	46.5%	59.5%
2017–2018	54.2.%	53%	61.2%
2018–2019	48.3%	50.8%	59.2%
2019–2020	Statewide Standardized testing paused due to COVID		
2020–2021	61.2%	57%	65.3%
2021–2022	56.9%	56.1%	63.1%

Note. Data Adapted from the Study state Department of Education (2023)

Since at-risk students are more likely to have their academic achievement negatively affected than their counterparts (Collins, 2018), the data from a Southern state was further disaggregated to highlight the scores of Grades 3 through 5 at-risk students on standardized assessments in mathematics. Table 2 shows the disaggregated data of a Southern state for 2016–2022 for at-risk students Grade 3 through Grade 5 who did not meet the state proficiency for state administered standardized tests in mathematics by sub population. During this period, statewide scores revealed between 2016–2022 approximately over half the percentage of at-risk students did not demonstrate proficiency on the state standardized test in mathematics for students in Grade 3 through Grade 5.

Table 2

State Standardized Mathematics Assessment for Sub Populations of At-Risk Students 2016–2022

At-Risk student sub-populations	2016–2017	2017–2018	2018–2019	2019–2020	2020–2021	2021–2022
Grade 3 Low SES	68%	65.2%	59.1%	Statewide	72.4%	70.2%
Grade 4 Low SES	66.8%	64.4%	62.5%	Standardized	68.1%	69.8%
Grade 5 Low SES	74.1%	72.6%	70.8%	testing paused due	76.2%	76.2%
Grade 3 ELs	67.6%	71.7%	64.6%	to COVID	81.4%	73.4%
Grade 4 ELs	67.5%	73.7%	70.1%		79.8%	74.9%
Grade 5 ELs	79.3%	89.2%	86.1%		90.9%	85.2%
Grade 3 SWDs	81.3%	79.3%	75.5%		80.9%	77.7%
Grade 4 SWDs	82.6%	80.6%	79%		81.1%	79.4%
Grade 5 SWDs	88.8%	87.6%	86.3%		87.2%	85.6%

Note. Data Adapted from the Study State Department of Education (2023).

In a Southern state, the local gap of teachers struggling to support the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics is further underscored by statewide students' mathematics performance. The state assessment data provided in

Table 1 support the gap in performance of at-risk students' Grade 3 through Grade 5 in mathematics. A retired elementary K–8 public school teacher in the study state with 36 years of teaching experience, and owner of a school that specializes in serving at-risk students, reported that teachers struggle with teaching at-risk students due to teachers' lack of assurance in their ability to teach this population of students (personal communication, February 13, 2021). This experienced educator also attributed teachers' struggling to teach at-risk students to gaps in teachers' foundational understanding of mathematics concepts and a lack in understanding how to apply research-based instructional strategies to meet the instructional needs of at-risk students (personal communication, February 13, 2021). Another educator, who has experience teaching all content areas for students in Grades 1–12 and is now an assistant director of special education for a large public school in the study state, also reported that it is difficult for teachers to teach mathematics to at-risk students (personal communication, February 13, 2021). This experienced educator of 18 years reported that there seems to be a connection between a students' low SES status and a teachers' lack of exposure to the circumstances, struggles, factors, and developmental issues these students face due to their poverty cycle (personal communication, February 13, 2021). This educator's perspective was that teachers are struggling to teach at-risk students because they do not possess a thorough understanding of how students' environments can adversely affect their academics and how to help students connect to the mathematical concepts' teachers are required to focus on to demonstrate proficiency on the state assessments (personal communication, February 13, 2021). Similar to these educators, a special education instructional coach for a large public school in the study state also noted that teachers struggle to teach at-risk students in mathematics (personal communication, February 13, 2021). This experienced educator has taught at-risk students for 9 years and asserted that teachers struggling to teach students with these demographics was due to a lack of background knowledge and resources to help educate teachers on the special needs of at-risk students (personal communication, February 13, 2021).

Purpose of the Study

The purpose of this basic qualitative study was to explore the perspectives of Grade 3 through Grade 5 teachers of instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5.

Research Question(s

For this study, I developed two research questions (RQs) to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. I conducted interviews to explore and ultimately answer the RQs. The RQs for this study were:

RQ1: What are Elementary teachers' perspectives of instructional supports and approaches, to support the mathematics achievement of at-risk students Grade 3 through Grade 5?

RQ2: What are Elementary teachers’ recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5?

Conceptual Framework

The conceptual framework for this study was Bruner's theory on the stages of representation. Bruner's theory on the stages of representation is widely used by mathematicians and was adapted to create the concrete, representational, and abstract instructional framework (CRA), (Peltier & Vannest, 2018). Bruner suggested that there are three modes of representation that learners are faced with when learning new material which include the enactive, iconic, and symbolic modes (Bruner, 1966). In the adapted form of CRA, the first stage, enactive, is the concrete stage. In this stage, the learner is gaining an understanding of the physical, or using manipulatives to understand the concept (Bruner, 1966). In the second stage iconic, or representational, the learner is moving from manipulatives to drawings, models, or visual aids of the concept (Bruner, 1966). The third stage, symbolic, is also called the abstract stage. In this stage, learners are moving from drawings to being able to visualize the concept within one's mind to apply and solve the problem using mathematical symbols (Bruner, 1966).

This theory is a framework that teachers can use to help students gain a deeper understanding of mathematical concepts. Therefore, the logical connection between the framework and my study is that the conceptual framework facilitates the basis of the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students.

Bruner's theory on the stages of representation is an instructional approach that can be used to provide more individualized, learner-centered support for each student. In this study, I explored the perspectives of mathematics teachers on instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. Bruner's theory on the stages of representation, as a conceptual framework, was vital in exploring teachers' understanding of scaffolding students' learning to ensure a deeper understanding of mathematics.

Nature of the Study

In this study, I used a basic qualitative design to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students in Grade 3 through Grade 5. Merriam and Tisdell (2015) described a basic qualitative approach as a research approach that seeks to understand and interpret individual experiences as it relates to a problem. I conducted 10 semistructured interviews to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students in Grade 3 through Grade 5. Interviews are used in qualitative design because they contribute to the descriptive nature of a qualitative approach (Merriam & Tisdell, 2015). By using semistructured interviews, I explored the perspectives of Grade 3 through Grade 5 teachers regarding the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. By using interviews for my study, I allowed participants to offer their professional insight into teachers' perspectives of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students in Grade 3 through Grade 5.

Participants who met the criteria of (a) being certified educators with experience teaching mathematics in Grades 3 through 5, (b) having experience teaching mathematics to students who failed to meet the state mathematics proficiency assessment, and (c) having experience teaching mathematics to at-risk student populations were recruited. At-risk was defined as students who are at-risk for school failure and includes other attributes such as low SES, low student achievement, qualifying as ELs, or SWDs (Slavin & Madden, 1989). I recruited participants through LinkedIn, Facebook, and state-wide Mathematics teacher organizational websites and did not involve a specific cooperating partner. Participants were chosen based on their disposition to understand the phenomenon (see Yin, 2016). Data were analyzed using Content analysis (see Downe-Wambolt, 1992) and Yin's (2016) five-phase data analysis that includes the following steps (a) compile, (b) disassemble, (c) reassemble, (d) interpret, and (e) conclude.

Definitions

At-risk: At-risk students are "students who are at-risk for school failure and include other attributes such as low SES, low student achievement, qualifying as ELs, or SWDs" (Slavin & Madden, 1989, p. 5).

Common Core Standards (CCS): Common Core Standards are "a set of uniformed standards that are designed to be relevant to the real world, while preparing students for post-secondary education and careers" (Soares et al., 2018, p. 2).

Concrete Representational Abstract (CRA): Concrete Representational Abstract (CRA) is a mathematics theory adapted and based on the stages of the representation theory created by Jerome Bruner in 1966. Bruner's theory formulates a process that sequentially moves students from working with concrete materials, to creating representational drawings, to being able to abstractly think and solve mathematical problems using language and mathematical symbols (Bruner, 1966).

English Language Learners (ELs): English Language Learner is a term used for any student that has difficulty speaking, reading, writing, or understanding the English Language and the language difficulties has a significant effect on the individual's level of English Language Proficiency (National Center for Education Statistics, 2021c).

Individuals with Disabilities Education Act (IDEA): Individuals with Disabilities Education Act (IDEA) is a federal law passed in "1975 to ensure children with disabilities have an opportunity to receive a free appropriate education" (Individuals with Disabilities Education Act, 2018). IDEA provides guidelines for the identification and qualification for students to receive Special Education Services (Individuals with Disabilities Education Act, 2018).

Socioeconomic Status (low SES): Socioeconomic status is a variable that uses parental education level, parental occupation, family income, and household items to categorize families (National Center for Education Statistics, 2023). Low SES refers to the range of weighted SES composite index distribution and families categorized as low SES that are living in poverty (National Center for Education Statistics, 2023).

Specific Learning Disability: Specific learning disability (SLD) is one of the 13 categories that students can qualify in to receive Special Education Services. SLD is “a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to perform mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia” (Individuals with Disabilities Education Act, 2018, para. 9).

Students with disabilities (SWDs): SWDs are students who “have been evaluated under the IDEA and found to meet eligibility criteria to be served as a student with a disability who needs uniquely designed specialized instruction eligible for Special Education services under Individuals with Disabilities Education Act (IDEA)” (Individuals with Disabilities Education Act, 2018, para. 1).

Assumptions

In this study, I assumed that the supports, approaches, and recommendations teachers use to help support at-risk students can contribute to the academic achievement of elementary at-risk students in mathematics. There are contributing factors for students’ failure to progress in mathematics and there are concerns surrounding the identification of instructional supports and approaches needed to support teachers in meeting the instructional needs of this population of students. I also assumed that the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk students Grade

3 through Grade 5 are valuable and will be useful for helping understand how to address the mathematics needs of at-risk students in Grade 3 through Grade 5. I assumed that the information gleaned from participants in this study can be communicated to the appropriate stakeholders, implemented within schools, and will aid in strengthening the mathematics academic achievement of at-risk students. Therefore, the perspectives of the participants on the instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk students Grade 3 through Grade 5 from this study can help strengthen and meet the instructional needs of at-risk students in mathematics.

I assumed that gaining the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk students Grade 3 through Grade 5 will help provide insight related to why teachers are struggling to support the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics in a Southern state. I assumed that data collection through interviews was a valid measurement tool to obtain the perspectives of elementary mathematics teachers Grade 3 through Grade 5. Finally, I assumed that teacher participants in this study would be willing to participate and would be truthful when sharing their perspectives so that this qualitative study could be conducted with reliability.

Scope and Delimitations

The scope of this study was limited to educators who had experience teaching mathematics to at-risk students in Grade 3 through Grade 5 in a Southern state. The research was not generalized but was limited to include a sample size of 10 teachers that had experience teaching mathematics to at-risk students Grade 3 through Grade 5. I explored the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5.

Limitations

Limitations related to the study included the sample size of 10 interviews and researcher bias. I anticipated the limitation regarding sample size and overcame this limitation by using semistructured interview questions and purposeful sampling to obtain rich, thick descriptions (see Yin, 2016) from participant of the instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. Additionally, I addressed the limitation of sample size by ensuring saturation was reached within the data collection process. I knew saturation was reached when no new data arose from the data collection or analysis and the interviews responses from participants were similar with no new information arising (see Saunders et al., 2018). I reached saturation by exhausting all information regarding the RQs from participants (see Saunders et al., 2018). The sample for this research study was delimited to a target sample of 10 participants.

Additionally, I anticipated the limitation of researcher bias. I have experience working with at-risk students in the capacity of classroom teacher and intervention teacher. As such, I planned to overcome the limitation of researcher bias using reflective bracketing and a field journal. According to Ahern (1999), by writing down preconceived notions about a phenomenon prior to conducting interviews, a researcher can reflect and process these notions so that during the interview process, they can focus on understanding what the participant is saying. I used reflective bracketing throughout the interview and data collection process to write down my thoughts on the phenomenon prior to conducting interviews. In field journals, researchers can keep track of vital information during the interview process (Phillippi & Lauderdale, 2018). I used a field journal to write down pertinent information that the participant said which I wanted to highlight later in the coding process. I used reflective bracketing and a field journal to reflect, process, and understand what my experiences were so that I could focus on understanding what the interviewees experiences were (see Ahern, 1999).

Significance

The significance of this study is that I provided more information on teachers' perspectives of instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk students Grade 3 through Grade 5. According to Nelson et al. (2019), students performing well in mathematics can result in positive social change, economic growth, and reduced crime rate. By exploring the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk Grade 3 through Grade 5 students, I provided valuable teacher feedback on why at-risk students struggle and how to support struggling at-risk students, which could lead to strengthening teaching practices. The growth of the United States economy is heavily influenced by how proficient students are in mathematics (Utah State Board of Education, 2019). Key career fields such as technology, engineering, mathematics, and science are all dependent upon the ability to apply mathematics at high levels. Cultivating students who can be productive in these careers is vital to being competitive and innovative on a world-wide level (Utah State Board of Education, 2019). When all student groups consistently perform well in the subject of mathematics, it may have a constructive bearing on the quality of their lives such as having more success in school and leading to graduation (see Nelson et al., 2019) which could result in a strengthened economy, and therefore result in positive social change.

Summary

In Chapter 1, I introduced the study, provided a background on the phenomenon, and established the problem, purpose, and RQs of the study. I also briefly reviewed the conceptual framework that guided this study. In Chapter 1, I presented the nature of the study, definitions, and assumptions. Lastly, in Chapter 1 discussed the scope and delimitations, limitations, and significance of the study. In Chapter 2, I provide a literature review of the literature used to inform this study. In Chapter 2, I also give an overview of the search criteria I used when conducting the literature review and a more in-depth explanation of the conceptual framework used in this study.

Chapter 2: Literature Review

In this study, I explored the perspectives of Grade 3 through Grade 5 teachers in a Southern state about the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. The ability to reason mathematically is a crucial skill to possess in an increasingly technologically progressive and data-propelled world. A 2019 report released by the Federal Government showed that in 28 states, students' overall state mathematics scores were below the national average in mathematics on standardized tests (The Nation's Report Card, 2019). The 2019 report from the Federal Government implies that there are numerous students at-risk in mathematics. As previously defined in Chapter 1, at-risk students are students who are at-risk for failing in school and include other attributes such as low SES, low student achievement, qualifying as ELs, or SWDs (Slavin & Madden, 1989). At-risk students perform poorly in mathematics, have difficulty in learning mathematics and can possess deficits in various mathematics cognitive tasks, including counting knowledge, processing numbers, and fundamental mathematical fact retrieval (Collins, 2018). However, researchers have shown that with the appropriate intervention strategies matched to students' individual needs, many Grade 3 through Grade 5 learners are more likely to meet grade-related levels of excellence (Collins, 2018). In this literature review I provide research studies that align to the phenomenon being studied, the contributing factors toward poor mathematics student performance for at-risk students and related performance concerns for this population.

Literature Search Strategy

When searching for literature for the literature review, I limited my results to peer reviewed research between the years of 2018 to 2022. The databases I used to collect the literature for this study were: Thoreau, SAGE Research Methods, Google Scholar, Education Research Complete (EBSCO), Education Resource Information Center (ERIC), and Taylor & Francis Online. The search term *teacher's perceptions of mathematical supports for at-risk students* did not yield sufficient information for the review of literature. As such, the following key words were used to locate additional literature: *at-risk math elementary, manipulatives + mathematics + disabilities + elementary, instructional strategies, struggling math elementary, instructional strategies for at-risk students in mathematics, math + struggling learners + elementary, Teachers barriers + math, supporting low SES children in mathematics, effects of mathematics + professional development, students + accommodations + math, professional development + mathematics, at-risk + differentiation + math, ELL + differentiation + math,* and *Bruner + math + struggles+ students.* Even with the addition of several search keywords, the literature was still limited which showed a need to further explore the topic.

Conceptual Framework/Theoretical Foundation

The conceptual framework for this study was Bruner's (1966) theory on the stages of representation, a theory Bruner developed that relates to the development of learning. Bruner's theory on the stages of representation aligned with exploring teachers' perspectives of supporting at-risk students in the subject of mathematics because in the stages of representation, Bruner described the students' cognitive stages of development and provides steps students need to take in order to understand mathematics concepts. Educators use Bruner's theory on the stages of representation as a framework to help support students to develop an awareness of mathematical concepts and to support the development of mathematics skills (Kanellopoulou, 2020).

Teachers struggle to support students to meet proficiency in mathematics on standardized tests. For teachers to support students in learning mathematics, teachers should have a solid grasp of students' developmental stages and how students' learning of mathematical concepts is affected by their developmental stage (Sheppard & Wieman, 2020). Therefore, in the stages of representation theory, Bruner explained how to design instruction and described how to use materials and activities to implement lessons related to the level of the student's brain development. Researchers have confirmed that educators perceive understanding how students learn mathematics as essential and that teachers' knowledge of mathematics is a priority when teaching mathematics (Sheppard & Wieman, 2020). Mathematics is "the science of numbers, quantities, and shapes and the relationships between them" (Merriam-Webster, 2023). The subject of mathematics involves complex concepts and to learn some concepts, students must be able to think abstractly; however, authors of child development theories have contended that children do not initially think abstractly, and teachers must build upon mathematics skills to advance the student to the stage of comprehending abstract concepts and the capability to apply abstract reasoning to mathematics problem-solving. Piaget (1963) suggested in his cognitive development theory that early elementary grade children are dependent upon concrete objects, pictures, actions, and symbols to develop mathematical meaning and understanding of mathematical concepts. Piaget (1963) identified the stages as (a) sensorimotor stage, (b) preoperational stage, (c) concrete operational stage, and (d) formal operational stage. As children develop and progress through Piaget's (1963) four stages of cognitive development, children become capable of visualizing the concrete and pictorial manipulatives and eventually can think abstractly about mathematics concepts.

Bruner addressed the construct of learning mathematics and emphasized that learning mathematics occurs in three stages. Bruner (1966) contended students understand mathematics efficiently when they can move sequentially through mathematics concepts from working with concrete materials, to creating representational drawings, to being able to abstractly think and solve mathematical problems. The three stages in Bruner's (1966) theory on the stages of representation are (a) enactive, (b) iconic, and (c) symbolic. In the enactive stage teachers provide manipulatives to help students with solving mathematical problems. Teachers can use any type of manipulative, so long as it is physical or something the students can physically touch and move. Students at-risk in mathematics often use manipulatives to help support deficits and/or academic gaps in foundational mathematics concepts such as number sense and counting (Powell et al., 2020). Bouck and Park (2018) performed a systematic review of the literature consisting of 36 peer reviewed studies to explore how teachers supported SWDs in mathematics. Bouck and Park's (2018) review focused on mathematics manipulatives to support SWDs and found that one of the consistent instructional approaches used with struggling students is the use of manipulatives. Bouck and Park revealed that manipulatives were a common accommodation listed on individualized education programs (IEPs) for SWDs in mathematics. Bouck and Park (2018) asserted that using manipulatives in mathematics can positively influence students' mathematics abilities. Therefore, Bruner's (1966) theory on the stages of representation is also an effective framework to use for students who are at-risk in mathematics. In Bruner's (1966) second stage, iconic, teachers transition students into being able to represent the physical manipulatives into drawings such as tally marks, dots, circles, or pictures of the objects. In Bruner's (1966) final stage of representation theory, symbolic, teachers transition students to represent their objects as numbers and symbols to solve mathematical problems. Instructional practices adopted by educational institutions and teachers have been founded on Bruner's (1966) theory on the stages of representation. Bruner contended that learning mathematics involves progressing through stages and assimilating mathematical skills as the concepts spiral to more complex mathematical skills. Hence, if students do not advance through each stage, then progressing to abstract thinking successfully will be hampered; consequently, abstract thinking in mathematics will be compromised.

Bruner's theory on the stages of representation has been adapted throughout the years but still consists of the three main stages: enactive, iconic, symbolic (Milton et al., 2018). Peltier and Vannest conducted a case study of 25 students in a co-teaching setting to explore the effectiveness of using CRA framework, based on Bruner's stages of representation theory, to help support SWDs' mathematics skill development. In Peltier and Vannest's (2018) study, SWDs faced additional struggles when learning mathematics using adaptations of the three stages of representation theory. During the enactive stage, teachers had to take extra precautions in choosing manipulatives to use with SWDs due to their lack of focus and shorter attention spans. Peltier and Vannest (2018) found that despite the additional planning considerations teachers had to make for SWDs, if teachers did not carefully select manipulatives based on the knowledge of their SWDs' needs, students would play with the manipulatives instead of using them as a mathematical aid. Peltier and Vannest (2018) found that when all three stages of representation were followed and implemented with fidelity, the method was an effective instructional framework to support teaching mathematics to SWDs in various grades, skill sets of mathematics and students with variety of disabilities. Similar to the findings from Peltier and Vannest (2018), Kanellopoulou (2020) conducted a qualitative study to understand the effectiveness of using the CRA framework, based on Bruner's stages of representation theory, with SWDs while learning counting skills. Kanellopoulou's (2020) findings revealed that after receiving interventions using the CRA framework, an adaptation of Bruner's theory on the stages of representation, students improved in the mathematics areas of rote counting, use of number word recognition, solving arithmetic problems, comparing, grading, and sorting. Kanellopoulou's study confirmed that the CRA method was effective in improving mathematical skills with SWDs (2020). Likewise, Camañan (2019) conducted a quasi-experimental design to establish the effect of CRA in enhancing the performance of students in mathematics as compared to using a conventional, lecture-style, approach of teaching mathematics. Camañan (2019) revealed, while students showed improvement in their mathematics abilities when the conventional approach was employed, students showed additional growth when the CRA method was employed. Thus, the CRA approach was found more effective to improve student mathematical performance than the conventional approach. Using the CRA framework, teachers can focus specifically on teaching mathematics effectively.

Bruner's theory on the stages of representation is relevant to the current study exploring how Elementary teachers' implement mathematic instructional supports and approaches to support the mathematic achievement of at-risk students Grade 3 through Grade 5 because Bruner's theory on the stages of representation provides a framework for teaching and understanding mathematics (see Bruner, 1966). The findings of this study contained Grade 3 through Grade 5 teachers' perspectives on at-risk students in mathematics. This comprehensive study that explored the perspectives of Grade 3 through Grade 5 teachers will contribute to the literature on instructional approaches that can be used to help support struggling students in mathematics. In the literature review that follows, I discuss mathematics and the characteristics of struggling students in mathematics.

Literature Review Related to Key Concepts and Variable

Mathematics Achievement in United States

Mathematics is an essential core subject that forms the foundation for the content and skills taught in the educational system. Mathematics is a required core subject for all students in primary and secondary levels (Mazana et al., 2019), yet students are failing to meet mathematics proficiency standards on statewide standardized assessments (Collingwood & Dewey, 2018). As a result of students failing to meet proficiency in mathematics on statewide standardized tests, legislators implemented several initiatives aimed at increasing student achievement in mathematics, such as Common Core Standards (CCS) (Soares et al., 2018). CCS is a set of uniformed standards that are designed to be relevant to the real world, while preparing students for post-secondary education and careers (Soares et al., 2018). CCS are used in 42 states, the District of Columbia, and four territories (Soares et al., 2018). CCS were created to set national standards for what students were expected to understand and be able to demonstrate mathematically at every grade level.

Despite initiatives, such as CCS, the decline in mathematics performance is at a 25-year low (Nelson et al., 2019) and students have continued to struggle to achieve proficiency on national, and state administered mathematics assessments. Bouck and Park (2018) cited data from the National Assessment of Educational Progress (NAEP) that indicates, in 2015, 32% of 4th graders and 33% of 8th graders were at or above proficiency levels in mathematics. Across the nation, test scores in mathematics have not increased, as is evident in 2017, 2019 and 2022 reports from the Nation's Report Card. The Nation's Report Card, data compiled and released by the Federal government, revealed in 2017 students' scores in 23 states were below the national average in the subject of mathematics on state standardized tests (The Nation's Report Card, 2017). In 2019, the Nation's Report Card revealed students' overall mathematics assessment scores in 28 states were below the national average (The Nation's Report Card, 2019). In 2022, the Nation's Report Card revealed students' overall mathematics assessment scores in 24 states were below the national average (The Nation's Report Card, 2023). Ardi et al. (2019) conducted an initial study that included 127 elementary students to explore student learning difficulties regarding math related anxiety, self-efficacy, and math values and the affects these factors have on students' mathematics performance. Ardi et al. (2019) found that mathematics anxiety, mathematics self-efficacy, and mathematics values presented barriers to learning and could be a predictor of low achievement in students and these factors can influence a student before entering Kindergarten. Elliott and Bachman (2018) conducted a meta-analysis of literature to investigate mathematics difficulties in young children. Elliott and Bachman (2018) found that upon entry into kindergarten 5% of children could not recognize numbers. Consequently, during a systematic review of literature, Nelson and Powell (2018) concluded that students who enter elementary school and demonstrate challenges in learning mathematics during the primary grades are more likely to demonstrate mathematics difficulties in later grades and that students' failure to master mathematics skills at the elementary level could predict the mathematics performance of the students during middle and high school levels. Therefore, Nelson and Powell (2018) concluded that if a student is struggling with mathematics early on in elementary school, then they will likely continue struggling in later grades. Likewise, Nelson et al. (2019) carried out a mathematics intervention program to assess the fidelity and effectiveness of mathematics interventions and further emphasized the importance of improving mathematics achievement among students. Nelson et al. (2019) discovered there was a relationship between students who performed below grade level on standardized test in mathematics and negative effects on the economy such as the increased cost of healthcare and elevated crime rates. As such, students' achieving proficiency in mathematics is imperative for economic growth and has implications for society related to crime.

Factors That Influence Students' Mathematics Achievement

Researchers have identified several factors that can influence students' mathematics achievement that include mathematics anxiety, self-efficacy, attitude, belief and perceived cost of mathematics, and academic deficits. In a quantitative study designed to understand the connection between mathematics anxiety and mathematics achievement, Mutlu (2019) defined student mathematics anxiety as feelings of pressure that interfere with the computation of numerical concepts and mathematics problem-solving concepts in an academic setting and everyday life situations. Similar to Mutlu's definition, Ardi et al. (2019) defined mathematics anxiety as an intricate psychological situation that is manifested in the form of stress and worry when faced with mathematical situations. Shahsavani et al. (2020) sought to develop a professional development (PD) program to help support teachers to teach mathematics. Shahsavani et al. (2020) performed a systematic review to explore the effects mathematics PD had on teachers. Shahsavani et al. (2020) found the main themes of literature focused on students' cognitive abilities, students' brain function while learning mathematics, and factors that can influence students' mathematical process. Shahsavani et al. (2020) noted one factor that can negatively influence students' mathematical process is pressuring students to learn mathematics and alluded such pressure can result in an emergence of fear and anxiety. Consequently, Ardi et al. (2019) conducted a preliminary examination of causes for learning difficulties in mathematics. Ardi et al. (2019) administered the

Mathematics Anxiety Rating Scale- Elementary Form (MARS-E) inventory scale to participants and found mathematics anxiety was a factor that could negatively affect students' academic achievement. Students' mathematics anxiety is not limited to the school setting but can also manifest in daily life activities. Students who experience mathematics anxiety tend to engage in avoidance behavior (Ardi et al., 2019). Ardi et al. (2019) also found that a student's mathematics anxiety can manifest in the student experiencing feelings of rejection, incapacity to improve memory, and lack of enthusiasm that continue to impede mathematics achievement. Additionally, Ardi et al. (2019) claimed that students' mathematics anxiety can trigger negative emotions, resulting in adverse ramifications on a student's self-efficacy and incite negative beliefs concerning their mathematical abilities. Self-efficacy is defined as a student's belief to solve mathematical problems related to applications in daily life (Ardi et al., 2019). Ardi et al. (2019) indicated that a student's academic performance in mathematics is closely tied to self-efficacy and belief systems, and that improved self-efficacy and a positive belief in a student's capability to compute mathematical calculations and comprehend mathematical concepts can decrease mathematics anxiety within students.

While mathematics anxiety affects students, mathematics anxiety can also affect mathematics teachers as well. In an experimental study conducted by Ramirez et al. (2018) the study findings were that mathematics teachers who do not specialize or use mathematics on a regular basis experienced mathematics anxiety when having to teach mathematics to students. Ramirez et al. (2018) define mathematics teacher anxiety as continual fear, stress, anxiousness, and nervousness related to settings that require mathematics. Mathematics teacher anxiety can take place in daily life activities or exclusively in the classroom setting. Ramirez et al. (2018) discovered teachers have elevated levels of mathematics apprehension than any other profession or mathematics related field. Just as a student's mathematics anxiety can alter the student's ability to learn mathematics, a teacher's mathematics anxiety can disrupt a teacher's performance and ability to effectively teach mathematics (Ramirez et al., 2018). Ramirez et al. (2018) indicated mathematics teacher anxiety can severely undermine the teacher's ability to acquire mathematic knowledge and therefore, have a negative effect on the students' mathematics achievement. Both students' and teachers' mathematics anxiety initiates from a psychological state and when manifested can cause individuals to engage in avoidance behaviors (Ramirez et al., 2018). While a student's mathematics anxiety may prohibit learning on an individual level, a teacher's mathematics anxiety can have negative ramifications on a larger scale. Ramirez et al. (2018) reported that teachers believed their mathematics anxiety reduced their ability to effectively teach their students mathematics.

In addition to mathematics anxiety, a student's attitude can also be a barrier when learning mathematics. A mixed method study conducted by Mazana et al. (2019) revealed a student's attitude significantly contributes to their performance in mathematics. Baten et al. (2020) conducted an experimental study exploring students' motivation to learn mathematics and the perceived cost students placed on learning mathematics. Baten et al. (2020) discussed perceived cost as the value students place on learning mathematics would have on their daily lives and the time it took for them to learn mathematics. Baten et al. (2020) discovered task difficulty was affirmatively associated with students' attitude toward attempting mathematical tasks. When presenting students with a task they considered too difficult, the students became less interested, appeared visibly irritated and cognitively disengaged (Baten et al., 2020). Conversely, Ewing et al. (2019) performed a descriptive case study to aid teachers in using strategies to engage all students in productive struggle when approaching mathematics problem-solving and argued that students should be given challenging mathematics tasks to ensure productive struggle. Ewing et al. (2019) defined productive struggle as students grappling to make sense of challenging problems. Ewing et al. (2019) insisted that students who engaged in productive struggle learned mathematics on a deeper level than students who did not engage in productive struggle. One strategy Ewing et al. (2019) provided to engage students in productive struggle was to have the teacher ask meaningful questions to help guide the students to the answer instead of providing the student with the answer. While Baten et al. (2020) acknowledged that challenging work would be inevitable as students progressed through grade levels; Ewing et al. (2019) argued that teachers should engage students, at any grade level, in productive struggle.

Low Socioeconomic Status and Student Mathematics Performance

Low SES is considered to influence students' early life experiences regarding overall school performance, including mathematics performance, and attitudes toward learning (Slavin et al., 1989). SES index is used to determine an individual's economic status and is composed of several equally weighted components such as parents' educational status and family income and is expressed in terms of high, middle, and low

SES status (National Center for Education Statistics, 2021a). School aged children who live in poverty-stricken areas are considered to be in the highest poverty levels and the classification is indicated by the student's Free or Reduced-Price Lunch status. To qualify for free lunch students must meet the federal poverty level in which a student's household income must be less than 130% to qualify for free meals and 130% and 185% to qualify for reduced- lunch prices (National Center for Education Statistics, 2021a). The National Center for Education Statistics (NCES) compiled an annual report describing SES status of students in 2018 and reported that 45% of the students who identified as Black, were found the highest of all ethnicity groups to live in high poverty areas and be identified as low SES status. These data reflected that 44% of students who identified as Latinx lived in high poverty area and were also identified as low SES status, followed by 37% American Indian-Alaska Native, Pacific Islanders at 24 %, more than two races at 17%, 14% Asian, and 8% White (National Center for Education Statistics, 2021a). The NCES also reported that the risk factors of living in conditions synonymous with low SES are linked with unsatisfactory educational outcomes—including lower achievement scores, failing a grade, and failing or leaving high school (National Center for Education Statistics, 2021b).

Mathematics proficiency scores for students who are identified as low SES and grow up in poverty are lower than scores for students who did not grow up in poverty. Low SES students tend to perform worse in school compared to students who are not identified as low SES (Collins, 2018). Students classified as low SES typically earn lower grades, score lower on standardized assessments, and have a reduced likelihood of graduating high school and attending college (Collins, 2018). Low SES has been identified as a factor that negatively influences children in their formative years due to the stressful experiences children encountered, and the lack of access to resources because of living in poverty (Mooney et al., 2021). Collins (2018) conducted a psychological approach to identify the characteristics of students at-risk and suggested that low SES students have a different logic about the importance of learning mathematics than students who have not experienced economic hardship. Cook et al. (2020) performed a meta-analysis review of numerous findings to explore the relationship between home life and early numeracy skills in students. Cook et al. (2020) found that home life and environment were significantly related to low SES students' struggle with early numeracy skills. Cook et al. (2020) found that parents' mathematics anxiety, attitude, and unbelief of mathematics as valuable is significantly related to low SES students' lacking numeric skills. In addition to parental influences, Mooney et al. (2021) conducted a systematic review of students identified as low SES and children's working memory and found that low SES students were more likely to have deficits with working memory and task performance. Additionally, Mooney et al. (2021) found that low SES students consistently scored significantly lower on working memory measures. Mooney et al. (2021) explained that working memory is a part of executive functioning and defines working memory as the capability of storing, processing, and recalling information over short periods of time to assist in cognitive activities. As such, Cook et al. (2020) emphasized, students who score lower on working memory are at risk in learning mathematics.

Students With Disabilities

A student is considered a SWD if that student has been evaluated and found to be eligible under the Individuals with Disabilities Education Act (IDEA) guidelines. IDEA is a federal law that provides guidelines for the identification of SWDs. According to IDEA legislation, there are 13 disability categories:

> an intellectual disability, a hearing impairment (including deafness), a speech or language impairment, a visual impairment (including blindness), a serious emotional disturbance (referred to in this part as “emotional disturbance”), an orthopedic impairment, autism, traumatic brain injury, another health impairment, a specific learning disability (SLD), deaf-blindness, or multiple disabilities, and who, by reason thereof, needs special education and related service (Individuals with Disabilities Education Act, 2018).

Over 7 million or 14% of all public-school students were considered SWDs and served under the IDEA during the 2019–2020 school year (National Center for Education Statistics, 2021d). The National Center for Education Statistics (2021d) reflected that 95% of all SWDs ages 6–21 attend a public-school setting, 3% attend a separate school reserved for SWDs, 1% attend private schools and 1% are served in homebound, separate residential centers or correctional facilities. Out of the SWDs served in the Public-School setting, 64% of SWDs are reported as serving 80% or more of their academic school day within the General Education setting (National Center for Education Statistics, 2021d). Data from the Nation’s Report Card in 2019 revealed that the majority SWDs did not meet proficiency on national, or state administered assessments at lower rates than their counterparts. The overall percentage of SWDs who met mathematics proficiency levels on state administered assessments was only 17% in 2015, 16% in 2017 and 17% in 2019 as compared to the overall percentage of students without disabilities who met mathematics proficiency levels at 44% in 2015, 44% in 2017, and 45% in 2019 (Nation's Report Card, 2019).

In 2018, the NCES reported that 33% of all SWDs qualified for IDEA under the SLD category (National Center for Education Statistics, 2021d). According to the Individuals with Disabilities Education Act (2018):

> SLD is defined as a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to perform mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

According to the Individuals with Disabilities Education Act (2018), SLD is not inclusive of students who have learning difficulties directly related to deficits in their ability to see, hear or motor functions, of intellectual deficits, of emotional disorders, or of economic difficulty. In 2019, 72.2% of 6 through 21-year-olds identified as SLD were reported to spend 80% or more of the academic school day within the General education setting (National Center for Education Statistics, 2021d). For the intent of this paper, SWDs will encompass the IDEA category of SLD.

SLD is a disorder concerning one or multiple psychological processes regarding language which affects academic difficulties and could include conditions such as: Dyslexia, Dysgraphia, Dyscalculia, Dyspraxia, Dysphasia/Aphasia, Auditory Processing Difficulty, and Visual Processing Difficulty (Al Otaiba & Petscher, 2020). SLD is considered a developmental disorder that can begin in early school aged children (Küçükalkan et al., 2019) but, due to early childhood developmental stages, this developmental disorder is formally identified in latter elementary grade levels (Stevens et al., 2018). SLD causes continuing difficulties in the subjects of mathematical problem solving and calculations, reading, and writing (Küçükalkan et al., 2019). Students identified as SLD often have inconsistencies in comprehending foundational mathematics skills dealing with the representation, sense, and comparison of numbers (Powell et al., 2020). Küçükalkan et al. (2019) stated Dyscalculia is a disability relating to an inability to solve, perform, and understand mathematical calculations, problem-solving, algebraic calculations, and operations related to geometry and the concept of time. Dyscalculia has been indirectly linked to a student's ability to focus on learning and can contribute to a student's inability to focus and retain information in mathematics such as mathematical facts or mathematical processes (Küçükalkan et al., 2019).

An important component to support at-risk students in mathematics is early identification of students who are struggling in mathematics. Al Otaiba and Petscher (2020) conducted a secondary analysis of 4th and 5th graders to explore developments and concerns regarding identifying and serving students identified as SLD. Al Otaiba and Petscher (2020) believed that despite several initiatives implemented, the field of education still has a long way to go to help improve the process to identify and support SWDs in the educational arena. Concurrent with Al Otaiba and Petscher's findings, data from a meta-analysis performed by Lein et al. (2020) revealed that on the NAEP, 56% of SWDs in fourth grade scored at or below basic compared to 84% of fourth graders with disabilities. Nelson and Powell (2018) performed a systematic review consisting of 35 experiments and found that students with mathematics difficulties tend to show less growth in mathematics than students without mathematics difficulties. Similarly, a meta-analysis conducted by Stevens et al. (2018) showed that SWDs scored below the basic levels disproportionally lower than students who did not have disabilities. Furthermore, Nelson and Powell (2018) examined 35 studies involving longitudinal mathematics achievement results and affirmed that students considered at-risk in mathematics did not catch up to their peers. Children as young as kindergarten who demonstrate deficits in mathematics have a higher probability to have mathematics deficiencies in secondary and adulthood outcomes (Nelson & Powell, 2018). Similarly, Griffin et al. (2018) conducted a qualitative study to explore PD created to assist mathematics educators to create inclusive elementary classrooms and asserted that SWDs demonstrate a lack of mathematics achievement levels that will more than likely lead to a limited exposure to advanced mathematics. Therefore, SWDs students will continue to struggle in mathematics without targeted interventions and early determination identification.

English Language Learners

In addition to SWDs being considered at-risk, ELs students are also considered at risk. ELs are students who struggle with understanding oral, verbal, linguistic, and written English Language and have not demonstrated proficiency in academic English (National Center for Education Statistics, 2021c). Students' who lack proficiency in English demonstrate challenges in their overall academic performance (National Center for Education Statistics, 2021c). Students may qualify as ELs if they are (a) not native to the United States, and have an inherent language other than English, (b) have a background where the dominate language spoken within the home is not English, (c) are American Indian or Alaska Native (National Center for Education Statistics, 2021a). Under Civil Rights Laws, educational institutions are obligated to provide ELs with educational resources to assist in learning English in an equitable and quality academic environment (National Clearinghouse for English Language-Acquisition, 2022). In 2018, 10.2% or 5 million students in the United States were considered ELs. Civil Rights law dictates educational institutions are required to make sure ELs have the same access to education as their counterparts (National Center for Education Statistics, 2021a).

ELs are also considered at-risk and must also take state administer standardized test (Lei et al., 2020). Lei et al. (2020) insisted that ELs tend to make errors in mathematics due to ambiguous language or miscomprehension of the verbal academic English. ELs may face challenges with the computational portion of mathematics and the academic challenging language content of mathematical problems. Lei et al. (2020) cautioned that though ELs may seem to speak fluently in English, ELs could be struggling with contents that involve academic discourse. Norval (2019) explored the equitability of national standardized mathematics tests for ELs and determined that ELs struggled with the linguistic components of mathematics. Norval (2019) asserted that mathematics standardized tests can be linguistically demanding, therefore, putting ELs at a disadvantage. Norval (2019) argued that to better support struggling ELs in the subject of mathematics, accommodations should be given to these students. Similarly, Luevano and Collins (2020) performed a quantitative study to examine the effectiveness of instruction that used cultural inclusive problem-solving strategies with Els and found that participants in the study showed gains in problem-solving and mathematical vocabulary acquisition. Thus, to help support the language needs of Els, linguistic modifications and instruction should be provided.

Supporting Struggling Teachers in Teaching Students Mathematics

Instructional approaches are proven to help support teachers in teaching mathematics and supporting at-risk students to learn more effectively. Tomlinson's differentiation framework, and Rose and Meyer's Universal Design Learning (UDL) framework, provide teachers with a guide to improving student achievement through inclusive teaching with a focus on all students. Tomlinson developed a differentiation framework to focus on increasing student achievement through ensuring the environment that students learn in is conducive to learning (Tomlinson, 1999). Using the differentiation framework, Tomlinson recommends an effective guide for teachers to teach students of various backgrounds, readiness levels, skill competencies, and interest levels (Tomlinson, 1999). The key components of Tomlinson's differentiation framework are that teachers can differentiate the learning process for students through five key components: (a) content or the knowledge, (b) skills that a student needs to learn, (c) process or the way a student comes to comprehend and reason through the content, (d) product or a way for students to show the information they have acquired, and (e) the environment or the emotions and experiences that make up the academic setting the students are in (Tomlinson, 1999).

Similar to Tomlinson’s differentiation framework, UDL also focuses on accessing the curriculum through making modifications to the learning process. UDL was created by Rose Meyers and colleagues at the Center for Applied Special Technology (CAST) by extending the Universal Design (UD) concept from 1980 aimed at supporting access for SWDs to the General Education curriculum (Rose, 2001). UDL, an inclusive learning framework, concentrates on the academic environment and not necessarily the student (Rose, 2001). The UDL design provides a framework for educators to reduce barriers and design accessible curricula and learning environments for the largest range of students (Rose, 2001). The three core tenets of UDL are (a) numerous methods of representation, (b) various activity and opportunities, and (c) several ways to engage students (Rose, 2001). García-Campos et al. (2020) performed a qualitative study to understand how UDL design affected SWDs with executive function deficits. García-Campos et al. (2020) found that the UDL framework enhanced removal of barriers for students to participate in learning. García-Campos et al. (2020) also found that UDL served as a framework that could help improve the executive functioning ability of students through providing teachers with resources to help produce a more flexible learning environment that adapted to diverse student styles. CRA, differentiation, and UDL are instructional frameworks that teachers can use to build a solid foundation to implement instructionally sound mathematics Evidence-Based Practices (EBPs).

EBPs are rigorous and relevant resources, activities, strategies and interventions derived from educational research metrics based on academic perimeters associated with educational institutions, educators, and student achievement (Office of Elementary & Secondary Education, 2022). Considerable improvements in student achievement can be achieved by using multi-tiered systems of support (MTSS) and selecting EBPs to implement as interventions within the framework (Nelson et al., 2019) Nelson et al. (2019) performed a meta-analysis review of qualitative studies and discovered that academic interventions can provide significant improvement in students' outcomes in mathematics. The findings of Nelson's meta-analysis review concluded that students achieved higher scores when interventions are implemented with an average of 95% or greater fidelity rating (Nelson et al., 2019). Like the findings of Nelson et al. (2019), Collingwood and Dewey (2018) conducted a quantitative study and found that implementation of early intervention for struggling students resulted in participants demonstrating an increase in performance. The increased performance in mathematics in the study conducted by Collingwood and Dewey was linked to the concept that interventions allow for increased opportunities for students to practice (Collingwood & Dewey, 2018). Lastly, Hwang et al. (2019) reviewed 22 experimental studies to examine the effectiveness of interventions on the mathematical concept of fractions as compared to regular classroom instruction on fractions and found that within the problem-solving domain, classroom instruction was less effective than interventions focusing on fractions. Kalogeropoulos et al. (2019) performed a qualitative study to provide interventions to students who had become disengaged in mathematics and found that teachers in the study perceived students who participated in the intervention as having gained a growth mindset, or a belief that they were capable of learning and improving academically. Additionally, students who participate in intervention programs can transfer the skills learned within intervention programs to better perform on mathematics related tasks.

While interventions can have positive effects on student achievement, several factors can affect the effectiveness interventions have on student academic achievement. In the meta-analysis conducted by Nelson et al. (2019) findings revealed that students who struggle in mathematics should be properly identified to participate in targeted interventions. Additionally, the success of an intervention program can be impeded when the intervention is not evidence-based, teachers are not properly trained, or the programs are not conducted with fidelity (Nelson et al., 2019). Intervention programs vary based on the structure, material, and implementation requirements. Some implementation requirements can be based on time frames, frequency, group size, location, or even materials made available during the intervention period. While interventions can improve student success, if an intervention is not implemented with fidelity, the desired results will not be achieved; therefore, the success of intervention programs relies on fidelity. Fidelity is ensuring the implementation of essential components of an intervention intended by the creators (Kim et al., 2018). Fidelity is rooted in the facilitators' thorough understanding of the intervention program, the requirements, and structure of the program (Kim et al., 2018). Facilitators of the program should be able to implement the intervention as designed to fulfill the requirements set forth by the intervention program on a regular basis (Kim et al., 2018). Findings reveal scores can meet or exceed set criterion and expectations when the intervention program is implemented with fidelity (Kim et al., 2018). While ensuring fidelity within interventions is vital to support at-risk students in mathematics, ensuring teachers are properly trained on best practices, strategies, and frameworks is also vital in supporting at-risk students in mathematics.

PD can deliver knowledge, skills, and strategies to help support educators teach mathematics to at-risk students. Teachers attending PD is essential to help support struggling students in mathematics. Sharp et al. (2019) conducted a mixed method study to explore perspectives of schoolteachers on implementing a mathematical approach and concluded that educator methods are highly influential and important to student learning. Lee and Cross Francis (2018) conducted a mixed method study to investigate the relationship between Elementary teachers' perceptions on using student thinking in instruction and teachers' professional awareness of skills. Lee and Cross Francis (2018) found that effective PD can help increase teachers' awareness of students' thinking process and help teachers to encourage productive student thinking in mathematics. Additionally, Rosli and Aliwee (2021) conducted a systematic literature review to explore effective components of PD for mathematics teachers. Rosli and Aliwee (2021) found that PDs can be used to positively affect teachers' attitude, teaching methods, teacher knowledge, and student academic goals. Likewise, Ennis et al. (2018) conducted an experimental design to determine the effects of instructional choices teachers implement. Ennis et al. (2018) asserted that teachers can use PD to enhance teachers' use of strategies to support the instruction and evaluation process of teaching. PD can also help teachers to become more knowledgeable about the diverse student population they may teach.

While traditional PD training programs are effective, Jakopovic (2021) conducted a narrative analysis to understand the role coaching has on novice teachers in mathematics and found that mentor and mentee coaching was also an effective form of PD training. Jakopovic (2021) asserted that coaches can help aid novice teachers to develop effective teaching practices by holding regular collaboration meetings and initially setting focused goals. Although PD can be effective, there are several barriers' teachers face that can render PD ineffective.

Anitasari and Retnawati (2018) performed a mixed method study to explore the mathematical motivation of teachers to continue PD and found motivation to be a barrier teachers faced. Anitasari and Retnawati (2018) asserted that mathematics teachers can face barriers with intrinsic motivation and extrinsic motivation when participating in PD. According to Anitasari and Retnawati (2018), intrinsic motivation for mathematics teachers can encompass expanding a teachers' mathematical knowledge, experience, quality of teaching, value, and job satisfaction. Extrinsic motivation for mathematics teachers to participate in PD can include salary increase, improved working environment, being prepared for upcoming changes, further development of career, and student achievement (Anitasari & Retnawati, 2018). Likewise, Tobondo and Retnawati (2018) conducted a mixed method study to identify the constraints and disadvantages mathematics teachers have regarding PD. Tobondo and Retnawati (2018) found that a deficiency of technology, funds, time, and teacher motivation were all constraints teachers in the study encountered. Tobondo and Retnawati (2018) emphasized the importance of ensuring effective PDs through seeking to remove barriers teachers may face.

Summary and Conclusions

Students who are considered at-risk in mathematics tend to struggle to obtain proficient levels in mathematics on standardized state tests. Researchers have conducted studies to investigate possible factors that influence the achievement of at-risk students to understand variables that contribute to students' challenges in learning mathematics. Some possible factors that influence at-risk students' performance in mathematics are student mathematics anxiety, teacher mathematics anxiety, and students' attitude about mathematics (Ardi et al., 2019; Mutlu, 2019; Shahsavani et al., 2020). Despite identifying possible factors that influence at-risk students' mathematics performance, teachers continue to struggle to support at-risk students in mathematics. To help support at-risk students in mathematics, it is imperative for teachers to recognize the student population they teach and for teachers to have a solid understanding of mathematics concepts (Sheppard & Wieman, 2020). Teachers lacking knowledge of the at-risk student population can lead to hindrances for these students in the subject of mathematics (Thomas-Browne et al., 2020). Teachers should seek out learning opportunities to help better support the at-risk population. Several studies were performed to understand the effects attending a PD has on the attendee. PD can help teachers develop an understanding of strategies to teach mathematics to at-risks students (Rosli & Aliwee, 2021). Therefore, teachers can utilize the strategies learned from PD to help better support their students' mathematics needs.

This study used a qualitative approach that aligned with exploring the perspectives of teachers in describing their experiences with instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. There is limited literature on the qualitative accounts of the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. Therefore, the findings of this study will help provide awareness into the phenomenon of supporting struggling teachers to support at-risk students in mathematics Grade 3 through Grade 5. In Chapter 2, I provided literature that supported the need to further explore teachers' perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. An explanation of the design and procedures used for this study are presented in Chapter 3.

Chapter 3: Research Method

The purpose of this basic qualitative study was to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. In Chapter 3, I share the research design and rationale used for the design as well as how the research design pertains to the phenomenon being studied. In Chapter 3, the RQs and the role of the participant in this study will also be explored. Additionally, in Chapter 3, I describe the methodology which will consist of procedures for participant recruitment, confirmation of meeting inclusion criteria, instrumentation, participation, data collection, data analysis plan and trustworthiness. Ethical procedures related to the participants are discussed followed by a summary of Chapter 3.

The RQs for this study were:

RQ1: What are Elementary teachers' perspectives of instructional supports and approaches, to support the mathematics achievement of at-risk Grade 3 through Grade 5 students?

RQ2: What are Elementary teachers’ recommendations to support the mathematics achievement of at-risk students’ Grade 3 through Grade 5?

The central concept of this study was that teachers are struggling to support the mathematics instructional needs of at-risk students who are in Grade 3 through Grade 5 in a Southern state. There was limited research on the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations used to support the mathematics achievement of at-risk students Grade 3 through Grade 5. The identified gap in practice is insufficient accounts of perspectives from mathematics teachers Grade 3 through Grade 5 on supports, approaches, and recommendations needed to support at-risk students and strengthen this population of students' mathematics achievement. Identifying teachers' perspectives of supports, approaches, and recommendations to support at-risk students Grade 3 through Grade 5 may fill the gap in practice of the teachers struggling to meet the instructional needs of these students. Furthermore, a gap in practice exists in the mathematics state performance between Grade 3 through Grade 5 students who are not at-risk and those who are at-risk as defined in the terms section of Chapter 1 (see Southern State Mathematics Test, 2016–2022). The use of a qualitative, basic study answered the RQs, and added to the literature pertaining to (a) Grade 3 through Grade 5 teachers' perspectives of instructional supports and approaches and (b) recommendations they have to improve the mathematics achievement of at-risk students Grade 3 through Grade 5. Thus, the findings from this study will fill a gap in practice and fill a gap in the literature as there are few qualitative accounts of Grade 3 through Grade 5 Elementary teachers related to the supports, approaches, and recommendations to support at-risk Grade 3 through Grade 5 students in mathematics achievement.

The research approach for this study was a basic qualitative design. A quantitative approach was considered for this study; however, Sandelowski (2000) suggested a quantitative method focuses on concepts and not the meanings of events participants have experiences. A quantitative approach does not provide any indication, facts, or data about the events (Sandelowski, 2000) and therefore, would not provide teacher perspectives on the phenomenon. Merriam and Tisdell (2016) suggested that researchers should conduct qualitative research to explore an individual's understanding of the world around them and how individuals interpret meaning to those encounters. Ethnography and phenomenology were qualitative designs considered for this study, but ultimately ruled out. According to Hammersley and Atkinson (2007), ethnography is a qualitative design that can be used with interviews to understand a reflective process. However, ethnography is used to study the life history of a group of people over a span of time (Hammersley & Atkinson, 2007). The purpose of this study was to explore the participants individual set of experiences as it relates to the phenomenon and not to focus on the history of those participating. The phenomenological approach is geared toward exploring the participants' encounters of their everyday world (Byrne, 2001). In using a phenomenological approach, researchers seek to understand human experiences and the way an individual understands and values and his or her world (Wilson, 2014). Phenomenological research allows for interpreting an individual's experiences in multiple ways, which could lead to varied interpretations (Sandelowski, 2000). Alternatively, a basic qualitative design would allow for a type of interpretation that is low-inference and more likely to have a consensus conclusion (Sandelowski, 2000). A basic qualitative approach will facilitate the understanding of a naturally occurring problem through using interviews to collect data regarding the selected issue to be explored in the study (see Yin, 2016).

A basic qualitative research approach was used for this study to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. I used a basic qualitative research approach to examine how individuals experience a phenomenon (see Merriam & Tisdell, 2016). I collected data through 10 semistructured interviews of Grade 3 through Grade 5 teachers who met the participant inclusion criteria. Additionally, I used a basic qualitative design to use inductive strategies to search for meaning (see Merriam & Tisdell, 2016). I allowed the participants to provide their experiences with instructional supports and approaches they used when teaching mathematics to at-risk students Grade 3 through Grade 5 and addressed the RQs of the study. Lastly, I used a basic qualitative approach so that. participants could provide their perspectives and recommendations on how to improve the supports and approaches needed to strengthen the academic achievement of at-risk students Grade 3 through Grade 5 and provide recommendations to strengthen the students' academic achievement in mathematics.

To avoid research biases, I used the strategies of field journaling and reflective bracketing. Phillippi and Lauderdale (2018) described field journaling as a process of keeping track of vital information by writing down contextual information, observations, and even questions. Furthermore, researchers have suggested that using a field journal enables researchers to collect and provide accurate descriptions of interview responses characterized by thick and rich descriptions (see Phillippi & Lauderdale, 2018). Similar to field journaling, reflective bracketing is another strategy that researchers employ in providing accurate descriptions of the interviews. According to Ahern (1999), reflective bracketing is a strategy that can eliminate biases because reflective bracketing aides an interviewer in productively trying to understand the interviewee's experiences instead of trying to eliminate or alter them. Researchers use reflective bracketing to record their own preconceived notions or experiences related to the phenomenon and ideas that transpire during the data collection process to raise one's consciousness of thoughts that may influence perception and interpretation (see Ahern, 1999).

Role of the Researcher

In qualitative research, the researcher is considered a central figure in the data collection process as often the researcher is the individual collecting the information via interviews, observations, or other means (Merriam & Tisdell, 2016). In this basic qualitative study, as the researcher, I was a research instrument as I collected the data from participants, listened, and interpreted the information shared by recruited participants (see Merriam & Tisdell, 2016). As the researcher my role was that of an interviewer and observer. As an observer, I conducted interviews with the participants. I am currently employed as an information technology specialist for a public school in a Southern state. In this role, I provide technology assistance to staff, teachers, and students for software programs used to support students in pre–kindergarten through 12th grade public instructional settings. As the researcher, I did not have any supervisory role over any participants recruited. Since I recruited participants from within a state I work in as an educator, there was one participant who did know me as an educator in the Southern state. As such, I reiterated to the one participant who knew me, that this study is separate from my role as an educator in this state.

In previous roles and places of employment, I taught mathematics for grades kindergarten through sixth grade in general education, gifted and talented education, special education, and served as an intervention specialist. In these roles, I held no supervisory roles.

The use of interviews was appropriate to obtain an understanding of teachers' perspectives of ways to improve the supports and approaches needed to strengthen the academic achievement of at-risk students' Grade 3 through Grade 5 and teachers' perspectives of recommendations to strengthen the students' academic achievement in mathematics. Participants were recruited statewide via social media platforms, and through electronic bulletin boards of Mathematics organizations for teachers in this Southern state. Since I previously taught mathematics and at-risk students, it was possible I may have biases related to mathematics and at-risk students. I used the strategies of field journal and reflective bracketing to control any bias (see Creswell, 2014; Yin, 2016). In addition, I also used member-checking to reduce bias (see Korstjens & Moser, 2018). Member-checking is a process that includes having the participants review the draft findings of the study and provide feedback or corrections to the researcher's interpretation of the information collected (see Korstjens & Moser, 2018).

Methodology

Participant Selection

For this study, I recruited certified Elementary teachers who had experience teaching mathematics to at-risk students using purposeful sampling. According to Yin (2016), for qualitative research to gather information from participants related to the.

phenomenon, researchers should intentionally choose participants for their study. The participants selected should be capable of providing rich, thick, descriptions, perspectives, and insight into the phenomenon (Yin, 2016). Therefore, the participants in this study were teachers who had experience teaching mathematics to at-risk students Grade 3 through Grade 5. As noted in the terms section in Chapter 1, at-risk is defined as "students who are at-risk for school failure and include other attributes such as low SES, low student achievement, qualifying as ELs, or SWDs (Slavin & Madden, 1989 p. 5). Barley, et al. (2002) defined at-risk students as K–12 students who are not meeting standards and who are "(a) low performing on an academic assessment, or (b) at-risk for low performance based on factors such as high poverty" (p. 11). Participants for this study were selected using this inclusion criteria: (a) certified educators with experience teaching mathematics in Grade 3 through Grade 5 in a Southern state, (b) experience teaching mathematics to students who have failed to meet the state mathematics proficiency assessment, and (c) experience teaching mathematics to at-risk student populations who qualify as low SES status, or those living in poverty, ELs, or SWDs. Purposefully selecting participants who met these criteria allowed me to conduct in-depth, semistructured interviews to answer the RQs and explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students.

I used a demographic screener to ensure all participants met these criteria. The recruitment goal for this study was a total of 10 to 12 participants. Participants were identified, contacted, and recruited using recruitment fliers via social media platforms, LinkedIn, and Facebook, as well as electronic bulletin boards of Mathematics organizations for teachers in this Southern state. I received contingent agreement from electronic bulletin boards of Mathematics organizations for teachers in this Southern state to post the recruitment flyer on the organizations' electronic bulletin boards. The contingent agreement to post the recruitment flyer was received via email from technical support contact persons who work for the websites for Mathematics organizations for educators in this Southern state. There was no partner organization for this study, and I recruited participants from this Southern state, state-wide using the avenues described.

My goal for this study was to interview 10 to 12 participants who met the inclusion criteria specified. The number of participants selected allowed for the data collection to reach the moment that no more new data is identified, or data collection becomes redundant to certify that saturation is achieved (see Saunders et al., 2018). Qualitative researchers can reach saturation with population sizes between nine to 17 participants (see Hennink & Kaiser, 2022); thus, I interviewed a total of 10 participants. Saunders et al. (2018) suggests sampling for interviews are commonly based on multiples of tens with one or two more interviews conducted beyond the multiples of 10 to ensure saturation is reached. According to Saunders et al. (2018), qualitative studies use saturation as an indicator that the researcher can discontinue data collection. Saunders et al. (2018) suggested that saturation is achieved when no new data arises from the research and is categorized by having the same themes, answers and responses provided. I knew that I reached saturation with my 10 interviews when the responses were similar and no new information was being obtained from the participants (see Saunders et al., 2018).

To gain access to the participants, I first obtained approval to conduct this study from the Walden Institutional Review Board, (IRB). I submitted a request to conduct this study and waited to receive Walden IRB approval with an approval number before initiating data collection. I created the recruitment flyer, consent, and demographic screener in Survey Monkey. Once I receive Walden IRB approval, I included the IRB approval number in an email with the recruitment flyer to the technical support contact person for Mathematics organizations for educators in this Southern state and requested that the recruitment flier be posted on their electronic bulletin boards. I also posted the recruitment flyer on social media websites, LinkedIn, and Facebook concurrently.

The recruitment flyer served as an invitation to participate in the study and contained a link to the informed consent. The recruitment flyer included the following: (a) participant criteria, (b) time commitment, (c), compensation, (d) informational meeting, (e) researchers contact information, and (f) a submit button that advanced participants to the informed consent form. The flyer was modeled after the Walden IRB model recruitment flyer. Participants clicked on the link and were advanced to the informed consent. The informed consent included (a) the purpose of the study, (b) RQs of the study, (c) sample interview questions for the study, (d) voluntary nature of the study, (e) risk and benefits of the study, (f) time required of participants, (g) provisions if the participant no longer wished to continue in the study or answer questions during the interview process, (h) provisions to protect the confidentiality of participants, (i) a statement that asked the participant if they understand the study and wished to volunteer, indicate by clicking the "next" button that advanced participants to the demographic screener, and (j) a statement advising the participant to please print or save this consent form for your records. The consent was modeled after the Walden IRB consent form. After reviewing the informed consent, if the participant felt they understood the study and would like to participate in the proposed study, they clicked "next" at the bottom of the consent form. Consent was obtained from participants after participants completed the consent form and clicked the submit button. Clicking "next" returned the consent to my Survey Monkey account. Therefore, participants self-selected into the study.

Once the participant clicked the submit button, they were advanced to an online demographic screener that confirmed that the potential participant met the inclusion criteria. The demographic screener included (a) participants first and last name, (b) preferred communication methods and option to provide contact information, (c) if the participant is a certified educator in the Southern state (d) if the participant has experiencing teaching mathematics to at-risk students Grades 3 through Grade 5, (d) grades taught in the Southern state, (e) experience teaching mathematics to students who failed to meet the state. mathematics proficiency assessment, (f) experience teaching mathematics to at-risk student populations who qualify as low SES status, or those living in poverty, ELs, or SWDs, and (g) a submit button. At the bottom of the demographic screener, the potential participant clicked, "submit" and the form was returned to my secure Monkey Survey account. Once the consent and the demographic screener were both received from a participant, I confirmed that the participant met the inclusion criteria. Next, I scheduled an interview at a mutually agreeable time by sending an electronic communication to the participant's preferred email. Lastly, I confirmed interview times and dates by sending an electronic communication confirmation of the interview date and time. I provided a follow-up email a week in advance of the scheduled interview time frames to remind participants of the interview time.

Instrumentation

I was the primary research instrument and used semistructured interviews to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports and approaches used to support the mathematics achievement of at-risk students Grade 3 through Grade 5, and recommendations to improve the mathematics achievement for this student population. I developed an interview protocol compiling interview questions geared toward answering the RQs (see Yin, 2016). I had an expert who is a retired educator in the Southern state with 20 years of experience teaching at-risk students and who did not participant in this study, review the interview protocol and interview questions to confirm content validity, and clarity (see Creswell, 2014; Ravitch & Carl, 2016). I also had my committee who are methodology experts review the interview protocol and interview questions and offer suggestions in terms of alignment to the RQs and content validity, and clarity (see Creswell, 2014; Ravitch & Carl, 2016). Researchers have noted that it is prudent to have experts in the area to be studied to review draft protocols and provide feedback (see Creswell, 2014; McKenzie et al., 1999; Ravitch & Carl, 2016). By using methodological experts to review the draft interview protocol, I supported alignment, content validity and clarity of the interview protocol (see Creswell, 2014; Ravitch & Carl, 2016).

In qualitative research, researchers use structured interviews that are comprised of predetermined questions that can constrict responses from participants due to the questions format, environment, and time constraints, whereas semistructured interviews allow for more in-depth interviews that allow for exploration of discussions as the questions are open-ended and the interview is more flexible (Elhami & Khoshnevisan, 2022). I used semistructured interviews to allow participants to provide more insight when answering the RQs (see Elhami & Khoshnevisan, 2022). I conducted semistructured interviews with open ended questions to give interviewees the opportunity to expand on their answers and answer the RQs (see Yin, 2016). The interviews were audio recorded but I also used field notes to document additional insights and thoughts that I had as they arose during the interview (see Merriam & Tisdell, 2016; Yin, 2016). I also used the field notes to guide any additional prompting or use of probes that was needed to gather further information from participants as I advanced through interview protocol (see Merriam & Tisdell, 2016; Yin, 2016). Probing and prompts were used in the interview protocol to serve as reminders and conversation guides (see Yin, 2016). Probes were used to prompt participants for further data to yield rich, thick descriptions for data collection (see Yin, 2016). I had a bank of probing questions available so that during the interviews I could gain clarification through prompting to ensure validity (see Klenke et al., 2016; Yin, 2018). As a part of the interview protocol, I provided participants with the RQs and sample interview questions in advance of the scheduled interview.

Procedures for Recruitment, Participation, and Data Collection

When selecting participants for a qualitative research study, the selection process should be strategic and purposeful (see Ravitch & Carl, 2016). Participants for this study were identified, contacted, and recruited via statewide social media websites, LinkedIn, and Facebook and through electronic bulletin boards of Mathematics organizations for teachers in this Southern state. Participation of participants was solely voluntary. I took the following steps when recruiting participants:

I obtained Walden University IRB ethics preapproval.

I obtained Walden University IRB final approval.

I recruited participants by posting recruitment fliers statewide via social media websites, LinkedIn, and Facebook, and through electronic bulletin boards of Mathematics organizations for teachers in this Southern state.

I obtained implied consent from participants.

I scheduled interviews with participants.

Prior to reaching out to any organization or participants, I applied to Walden University IRB for permission to conduct this study. After I received approval from Walden University's IRB system, I sent the recruitment flyer to a technical support contact person to post the recruitment flyer on the organizations' electronic bulletin boards. I posted a copy of the recruitment flyer on social media platforms, LinkedIn, and Facebook. The recruitment flyer described the participant criteria of: (a) certified educators with experiences teaching mathematics in Grade 3 through Grade 5 in this Southern state, (b) experience teaching mathematics to students who have failed to meet the state mathematics proficiency assessment, and (c) experience teaching mathematics to at-risk student populations who qualify as low SES status, or those living in poverty, ELs, or SWDs.

The recruitment flyer included the time commitment of 3 minutes to complete a demographic screener, online one-on-one interview conducted via a secured video conference platform that would not exceed 60 minutes, and 20 minutes to review the draft findings and provide feedback. The recruitment flyer also informed participants that participation is voluntary and listed compensation for participants who participate in the study. I also posted the recruitment flyer on social media websites LinkedIn, and Facebook concurrently. Participants self-selected into this study by providing implied consent. At the bottom of the recruitment flyer, there was a link to the informed consent that the potential participant may click on to advance them to the informed consent form. The consent form provided the participants with the study’s purpose, RQs, and sample questions. The letter of consent described the purpose, the voluntary nature of the study and included the risks and benefits of the study. The letter of consent described the process if a participant chose to withdraw, chose to not answer a question, or chose to take a break. I also described the confidentiality and privacy requirements of the study. I described to the participants the time commitment of participating in a secured video conference platform that would not exceed 60 minutes which I also audio taped. I described additional time commitments such as member checking which was estimated to take approximately 20 minutes and the demographic screener which was estimated to take approximately 3 minutes. After reviewing the informed consent, if the participant felt they understood the study and would like to participate in the proposed study, they clicked "next" at the bottom of the consent form. Clicking "next" returned the consent to my Survey Monkey account. Clicking next also advanced the participant to the demographic screener that confirmed the potential participant met the inclusion criteria. At the bottom of the demographic screener, the potential participant clicked, "submit" and the form was returned to my secure Monkey Survey account. I scheduled an interview at a mutually agreeable time by sending an electronic communication to the participant's preferred email. I confirmed interview times and dates by sending an electronic communication confirmation of the interview date and time. I provided a follow-up email 1 week in advance of the scheduled interview time frames to remind participants of the interview. My goal was to have 10 to 12 participants to interview in which I obtained a total of 10 participants for this study.

The steps for data collection included the following process:

Contacted participants.

Determined the time and established format used for the interview.

Conducted audio interviews with participants using a secure video conference platform using the audio only feature.

Reviewed and transcribed the interview data.

Sent a summary of the draft findings to participants and requested their feedback on my interpretation of their information.

Once a participant submitted the consent and demographic screener, I responded with a follow-up email to thank them for their interest in my study and to arrange an interview time. The consent form included sample interview questions for the participant to review prior to the interview. The participants selected time frames that were conducive for them, and I scheduled them based on the choices of other participants availability. I sent a follow-up email including the time of interview for the participant to confirm. Once the participant emailed back confirming they can participate at that time, free of interruptions and not interfering with their teaching related duties, I sent a follow-up email confirming the time and once again thanked them for participating in the study. I conducted the interview via a secure video conference platform which the participants accessed via a secured link to ensure privacy. I anticipated the interviews would not exceed 60 minutes.

I used semistructured interviews and probes to obtain each participant's perspectives on instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5 (see Merriam & Tisdell, 2016). I audio recorded the conference meeting using the recording feature within the platform. Audio recording the interview allowed me to concentrate on the participant's responses to the interview questions and probes (see Creswell & Poth, 2018). Only the audio recording feature was used on the virtual platform. At the start of the interview, I reviewed the purpose of the interview, study, and asked if the participant had any questions to ensure I set the tone for the interview as relaxed, and to develop a relationship with the interviewee (see Rubin & Rubin, 2012; Yin, 2016). Additionally, I had an audio recorder device on my phone as a backup and took notes in a field journal to reduce personal bias and increase reliability, trustworthiness, and content validity within my study (see Ahern, 1999; Yin, 2016).

During the interview I used my interview protocol and clarifying questions to gain quality, thick and rich data from participants (see Yin, 2016). During the interview if a participant did not offer a response to a question or veered off topic, I restated the question or asked a probe to redirect the participant back to the original question. At the completion of the interview, I asked if the participant had any questions and answered any questions. I explained to the participants how I would disseminate the draft findings of the study and the timeframe in which they should expect to receive the draft findings. I used member checking to solidify the validity of my study by explaining to the participants that they are encouraged to review the draft findings and share any comments with me via email (see Korstjens & Moser, 2018). I reminded the participants of privacy and confidentiality regarding their information. I reminded the participants their data will be stored in a secure place on my electronic device and will be destroyed after 5 years as required by Walden University. I thanked the participants for their time participating in my study and provided them with the electronic gift card. Within 24 to 48 hours, I transcribed any interview, analytic memos, and notes from my field journals (see Saldana, 2016).

Data Analysis Plan

Data analysis is an iterative part of the qualitative research process (Ravitch & Carl, 2016; Yin, 2016). The objective of data analysis within a study is aimed at being able to answer the RQs of the study through making sense of the data collected (Merriam & Tisdell, 2016). Data analysis is a process in which the researcher should examine, organize, and refine the information (see Yin, 2016). I used content analysis to analyze the information collected. In using content analysis, the researcher connects the information collected to the context in which they are generated (Downe-Wambolt, 1992). “Content analysis is a research method that provides a systematic and objective means to make valid inferences from the verbal, visual, or written data in order to describe and quantify specific phenomenon” (Downe-Wambolt, 1992, p. 314). In content analysis, information is presented in terms of actual numbers and how many codes are identified when examining a data set (see Krippendorff, 2018; Neuendorf, 2002). In this process, the researcher is seeking to interpret and summarize the information collected (see Downe-Wambolt, 1992; Krippendorff, 2018; Neuendorf, 2002).

The content analysis process includes examining the information collected both using deductive, and/or inductive analysis, and using an iterative process to determine the underling meaning of the conveyed responses from participants (see Bengtsson, 2016; Downe-Wambolt, 1992). I used a five-phase data analysis for this study: (a) compile, (b) disassemble, (c) reassemble, (d) interpret, and (e) conclude (see Yin, 2016). I also sent each participant a draft of the findings, thus using the strategy of member checking, which ensured creditability of the study allowing each participant involved in the study to have access to the findings (see Korstjens & Moser, 2018). In the following section, I describe the five-phase data analysis process.

Compile

Compile is the first stage in data analysis that includes organizing the data into a practical order (Yin, 2016). After completing the interviews, I began to collect and organize the data from transcripts and my field journal. I compiled all transcripts, field notes, reflective journal notes, and analytic memos (see Saldana, 2016) used to capture information from the participants in the study. I confirmed all data collected was complete and the transcriptions were an accurate reflection of the participants' interviews. Once I compiled the information collected, I began to disassemble these data.

Disassemble

Disassemble is the second stage in data analysis and includes breaking apart the data into smaller pieces (Yin, 2016). During this stage, I organized data using labels and colors to code into smaller, more manageable pieces. I took a more in-depth look at the data to find recurring information that I used to assign as a label or code. During this stage, I continued sorting through the data, in anticipation of going through the process of adjusting labels and codes as new labels and codes became evident. I used a spreadsheet to disassemble the data into columns that included my field notes and code categories as they arose from the data. I analyzed these data using a Priori codes grounded in Bruner's theory on the stages of representation. I also analyzed the information collected using open coding related to the literature as described by Saldana (2016) and identified descriptive codes from the participants' responses in the transcripts. Saldana (2016) described the overarching data analysis process of identifying codes, categories, and themes. I used an iterative process to analyze these data as I read and re-read transcripts and codes, making certain that I had adequately interpreted the participants' responses (see Kekeya, 2016).

Reassemble

During the reassemble phase, the third state of data analysis, I began searching for patterns within the data to see how it related to broader concepts and themes (see Yin, 2016). I continued using the spreadsheet to assist in refining the data and examined the number of codes. I began examining a Priori codes for patterns and compared the identified a Priori codes to the open descriptive codes identified. I analyzed the data for similarities and differences using pivot tables in the spreadsheet. I identified categories discerned from the descriptive open codes. I assessed the categories for patterns and themes that emerged based on my interpretation of the categories. Next, I examined the categories for themes that emerged. The themes that arose from these data were used to answer the RQs of this study.

Interpret

Interpret is the fourth stage of the data analysis process and includes describing the data findings (Yin, 2016). In this stage, I further explored the data to determine how the themes answered the RQs. This process consisted of disassembling and reassembling the data and organizing these data in different ways to ensure I had exhausted every possible theme or code within the collected information. After I interpreted the data, I created visual aids such as pivot tables and charts to illustrate and provide an accurate display of the data findings.

Conclude

The final stage of the data analysis process involves a narrative of the data findings (Yin, 2016). Within the conclude portion of the data analysis process I examined how the themes integrated with the literature and conceptual framework, and discussed the findings related to the purpose of the study in addition to answering the RQs. Moreover, this phase of data analysis may involve implications for conducting additional research to further explore the topic, challenging stereotypes within the topic, discussing new concepts pertaining to the research problem, and calling for action of possible stakeholders (see Yin, 2016).

Trustworthiness

Trustworthiness within a study ensures the research is valid and the findings are dependable. According to Yin (2016) a basic qualitative study can achieve trustworthiness when all parts of the study are consistently aligned. Trustworthiness within a study can be accomplished through thoroughly explaining the research process (Yin, 2016). An additional way to ensure trustworthiness in a basic qualitative study is to ensure data is consistent, accurate, and free from researcher biases (Yin, 2018). The methods of trustworthiness discussed in this chapter will include credibility, dependability, confirmability, and coder reliability.

Credibility

Credibility within a study ensures the proper processes are followed when collecting and interpreting data. According to Bengtsson (2016), credibility is a set of procedures a researcher should follow to ensure all data, interpretations, and findings from the study are precise and represent the information conveyed by the participants. Credibility provides assurance to the reader that the data collected are accurate (Bengtsson, 2016). The procedural process of credibility is an added safeguard in achieving trustworthiness. The credibility strategies that were used in this study included member checking, saturation, reflective bracketing, and triangulation.

Credibility was achieved through conducting member-checking. Member checking added another layer of credibility to the study by providing each participant involved in the study a draft of the study findings and asking the participants for their feedback to ensure I captured their sentiments accurately (see Korstjens & Moser, 2018). Credibility was also achieved through the interview process reaching saturation. According to Saunders et al. (2018), saturation is achieved when data, or information collected begins repeating. Interviewing Grade 3 through Grade 5 teachers who had experience teaching at-risk students provided valuable insights that other teachers can use to support at-risk students in mathematics. Once the interview responses began repeating and no new information was gleaned from the interviews, I knew saturation was reached (see Saldana, 2016; Saunders et al., 2018). Credibility was achieved through reflective bracketing during the interview process. I also accomplished credibility using a field journal to record my feelings and experiences related to the study topic, data, and findings (see Yin, 2016). Reflective bracketing and a field journal allowed for a process in which I observed my biases through providing explanation for decisions I make through the study (see Yin, 2016).

Triangulation of data during the data collection phase is an important part of ensuring credibility within a study. According to Yin (2016), triangulation validates a study through using multiple sources of data. Credibility was achieved through triangulating the information collected using interview responses, reflective bracketing notes, and a field journal during the interview process and the data analysis process (see Yin, 2016). While I anticipated additional triangulation of data via having participants bring a lesson plan to be able to reference during their interviews, no participant brought lesson plans, so they were not included in the triangulation process that involves using more than one source of data. The participants' lessons plans were going to be used as scaffolding items and not collected or analyzed. The hard copy of the participant's lesson plans would have served as data points which would have been another source of information I could triangulate with their experiences; however, no participants provided lesson plans during the interview process (see Yin, 2016). Therefore, I used interview responses, reflective bracketing notes, and field journal notes to triangulate data. Utilizing the strategies of member checks, examining these data until saturation was achieved, reflective bracketing, and triangulation all ensured the credibility of this study.

Transferability

According to Bengtsson (2016) transferability is the ability of being able to transfer or generalize the findings of a study to other situations, disciplines, or groups. I achieved transferability in this study by using the same interview protocol, interview questions, and probes, for each participant. I followed the approved interview protocol and design for each interview I conducted; therefore, increasing the integrity of my study (see

Bengtsson, 2016). Transferability was also achieved in this study through the collection of detailed, thick, rich descriptions, as detailed descriptions allow for others to be able to understand, replicate and generalize my findings to another setting (see Korstjens & Moser, 2018; Ravitch & Carl, 2016; Schwandt, 2015). Audit trail and field journals served as a way for me to interpret my thoughts regarding data analysis and to establish that the findings were based on the experiences and responses of the participants (see Bengtsson, 2016). Rich, thick descriptions was achieved through the interview process, responses received from the participants, audit trail, and field journals, which will allow other readers to make comparisons and replicate the study in other contexts (see Ravitch & Carl, 2016; Schwandt, 2015; Yin, 2016). Through data collection, interpretation, and dissemination of data from this study transferability was also achieved (Yin, 2016).

Dependability

According to Merriam and Tisdell (2016), to achieve dependability in a basic qualitative study, the findings should be able to be replicated. Dependability is achieved through having a clear research design and approach and thoroughly explaining the data analysis results and how data may change or did change overtime (see Bengtsson, 2016; Korstjens & Moser, 2018). Additionally, dependability is also achieved by providing a clear source of documenting your thinking of the data collection and interpretation overtime so the readers can track what you are doing (see Bengtsson, 2016; Korstjens & Moser, 2018). I achieved dependability in this study through keeping an audit trail, field journal, and ensuring the interview protocol questions were designed to answer and address the RQs of the study.

Confirmability

The last principle of trustworthiness is confirmability which ensures the research has captured the participants responses accurately. According to Yin (2016) to achieve confirmability in a study, the researcher must ensure their biases and perspectives do not influence the study. I ensured confirmability in this study by using reflective bracketing and notes in a field journal (see Ahern, 1999; Saldana, 2016; Wall et al., 2004). According to Ahern (1999), reflective bracketing can help a researcher identify potential biases through critical, continuous, self-evaluation. As a part of the reflective bracketing process, I wrote down my biases, perspectives, and perceptions of the phenomenon, prior to conducting interviews, in a researcher’s journal. Researchers use reflective bracketing to clarify and acknowledge areas in which they may be more subjective; therefore, I used these notes as a guide through the process to refer to and ensure I avoided those biases and preconceptions when analyzing the data (Ahern, 1999). I used a field journal to record observations during the interview and data analysis processes which were included in the triangulation and help to identify themes and coding (see Bengtsson, 2016; Ravitch & Carl, 2016; Saldana, 2016). I triangulated interview data from participants, reflective bracketing notes and my field journal.

Ethical Procedures

Ethical procedures should be put into place to ensure the protection of participants (Yin, 2016). It is imperative to protect participant data and participant’s personal information (Ravitch & Carl, 2016). I completed the CITI human subjects training in February 2023. To ensure my study was ethical, I implemented procedures outlined in

Walden University's IRB requirements. I did not begin the participant recruitment process prior to receiving IRB approval with Walden University. Once I received IRB approval from Walden University, I ensured my treatment of participants through the process was equitable and fair (Yin, 2018). I followed the Walden IRB approved protocol exactly.

Participation in my study was voluntary. Participant data and personal information was secured and protected to ensure the confidentiality of participants (Ravitch & Carl, 2016). Participant identities were protected throughout the process using numeric pseudonyms (Ravitch & Carl, 2016). In this study, I recruited participants through electronic bulletin boards and participants self-selected into the study voluntarily. Participants were allowed to withdraw from the study at any time and had the option to choose not to answer an interview question. I explained the purpose of the study and obtained informed consent from all participants. I described all confidentiality procedures, risks, and benefits to the participants. I followed the interview protocol and used the probes consistently with each participant.

I worked to build a trusting relationship with the participants through all communications and interactions throughout data collection and following the collection of interview data. Qualitative researchers must develop a relationship that supports open communication and a free exchange of ideas around the phenomenon being explored (Ravitch & Carl, 2016; Yin, 2016). All information, data, emails, interviews, and documents were password protected and stored in a secure electronic device. In accordance with Walden University's policies, all information will be deleted after 5 years.

Building trusting relationships between the researcher and the interviewer is imperative to Qualitative research (Ravitch & Carl, 2016). To ensure a trusting environment was formed, participants were under no pressure to continue the study if an unforeseen circumstance arose. Additionally, participants were provided with a copy of the consent as part of the informed consent process to ensure they understood what participating in the study entailed. They were aware of the interview process and sample interview questions before the interview was conducted. Lastly, I outlined to participants the ethical procedure that will be used to collect data and to analyze the data, as well as the procedures to ensure their confidentiality.

Summary

In Chapter 3, I reviewed my study to include restating the purpose of this study, research design and rationale for choosing to use a basic qualitative approach. In Chapter 3, I also explored my role as the researcher and the methodology of the study which included how I selected participants, what instrumentation was used, the procedures for recruiting participants and data collection. I concluded Chapter 3 by discussing the trustworthiness of my study to include credibility, dependability, confirmability, coder reliability and ethical procedures. In Chapter 4, I review the setting, data collection, data analysis process, findings including themes, trustworthiness and provide a summary.

Chapter 4: Results

Teachers are the pillar of the educational system and can affect the quality of education (Anitasari & Retnawati, 2018). As such, the problem I explored was that teachers are struggling to support the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics in a Southern state. To improve the quality of education, teachers must be supported (Anitasari & Retnawati, 2018). The purpose of this basic qualitative study was to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. In an effort to aid teachers in supporting the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics, the two RQs for this basic qualitative study were as follows:

RQ1: What are Elementary teachers' perspectives of instructional supports and approaches, to support the mathematics achievement of at-risk Grade 3 through Grade 5 students?

RQ2: What are Elementary teachers’ recommendations to support the mathematics achievement of at-risk students’ Grade 3 through Grade 5?

The RQs were informed by the conceptual framework of the study, Bruner’s theory on the stages of representation.

Bruner’s theory on the stages of representation also informed the design of the interview protocol and data analysis by providing a structural process and approach to support teachers in designing instruction for students to process mathematical concepts. Bruner’s theory on the stages of representation includes sequentially progressing through three stages to support learners with acquiring new information. Bruner (1966) believed that learners acquire information first through hands on experience, second through translating hands-on experience into drawings, and third through translating drawings into abstract thinking, that can be represented as numbers and mathematical symbols. Within the results of this study, findings emerged related to how participants explained their experiences on how they teach mathematics to at-risk students Grade 3 through Grade 5 pertaining to Bruner's theory on the stages of representation. In Chapter 4, I describe the setting, participant demographics, data collection, and data analysis. I also discuss the results of the study, evidence of trustworthiness and provide a summary.

Setting

I recruited participants statewide from this Southern state via Facebook, LinkedIn, and through electronic bulletin boards of Mathematics organizations for teachers in this Southern state. Participants were able to voluntarily self-select into the study through completing a demographic screener that contained participant inclusion criteria. Once participants completed the questionnaire, I sent an email to set an appointment with them at their convenience. Because I recruited teachers from across the Southern state, the interview setting was via a virtual conferencing platform. I used semistructured interviews using a self-designed interview protocol containing open-ended questions that were aligned with the RQs. All 10 participants completed the interview by answering six questions for RQ1 and five questions for RQ2. All interviews lasted no longer than 60 minutes.

Demographics

There were 10 participants in this study who were all certified to teach within the Southern state. All participants had experience teaching the subject of Mathematics with at-risk students in Grade 3, Grade 4, or Grade 5 in a public-school setting and self-reported that they were knowledgeable of teaching at-risk students. There were nine female participants and one male participant. Table 3 shows the numeric pseudonyms used for confidentiality of the participants, participant's gender, and grade level(s) taught.

Table 3

Participant Demographics

Pseudonyms	Gender	Grade level(s) taught	Knowledgeable of at-risk students
P1	Female	3,5	Yes
P2	Female	5	Yes
P3	Female	4,5	Yes
P4	Female	2–6	Yes
P5	Female	3–5	Yes
P6	Female	3–5	Yes
P7	Female	4,5	Yes
P8	Female	1–5	Yes
P9	Female	3–5	Yes
P10	Male	2,3,5–8	Yes

Data Collection

I served as the primary tool for data collection as the researcher for this study. Researchers note that qualitative researchers must conceptualize that they are the primary vehicle for collecting data although there is also an accompanying data collection protocol in qualitive research aligned to the RQs such as an interview protocol or observation protocol (see Creswell, 2014; Yin, 2018). I collected data from using semistructured interviews and probes to obtain each participant's perspectives on instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students (see Merriam & Tisdell, 2016).

I created a self-designed interview protocol to collect data from the participants. Bruner's theory on the stages of representation informed the development of the interview questions and protocol. Each participant was asked a total of 11 interview questions, six interview questions for RQ1 and five interview questions for RQ2. The interview questions were aligned to the RQs and were reviewed by my committee members. I incorporated the feedback from the committee into the interview protocol. Table 4 reflects the alignment of the RQs and interview questions contained in the protocol.

Table 4

Correlation of Research and Interview Questions

RQ	Interview question
RQ1: What are Elementary teachers' perspectives of instructional supports and approaches, to support the mathematics achievement of at-risk Grade 3 through Grade 5 students?	1. From your perspective, how do you describe an at-risk student in mathematics? 2. Describe your experience instructing at-risk students in mathematics. 3. Context: For this study, approaches could consist of things such as Universal design learning (UDL), Differentiation, Direct Instruction, Cooperative Grouping, or other research-based or evidence-based practices used to construct lessons to teach at-risk students mathematics skills. Please describe the approach(es) that you use and which ones you think are most effective to teach mathematics to at-risk students. 4. Please describe the role you think assessments play in meeting the needs of at-risk students in mathematics. 5. *Context: For this study, instructional supports are tools and resources used to support the learning of at-risk students.* What is your perspective and experience in the use of the following instructional supports regarding the development of at-risk students' understanding of mathematics concepts? • manipulatives • drawings, models, or visual aids • targeted interventions • peer tutoring • mnemonic devices • culturally or inclusive problem-solving word problems 6. *Context: This southern state uses the following mathematics domains to assess student's level of mastery on the state standardized assessment: Operations and Algebraic Thinking, Numbers and Operations (in base 10 for grade 4 and 5), Number and Operations-Fractions (for grade 4 and 5), Measurement and Data, Geometry.* When you are instructing at-risk students, how do you help students progress from concrete to abstract thinking in mathematics?
RQ2. What are Elementary teachers' perspectives of additional resources and recommendations they have to improve the mathematics achievement of at-risk students' Grade 3 through Grade 5?	1. *Context: For this study, resources include and are not limited to professional development, peer coaching, differentiated materials, manipulatives, etc.* Please describe the resources you have used to help support the needs of at-risk students in mathematics. 2. What additional resources do you think are needed to improve the achievement of at-risk students in mathematics? 3. What recommendations would you provide a struggling teacher to help support the mathematics needs of at-risk students? 4. How do you feel teachers are supported in helping at risk students' mathematics achievement? 5. What recommendations do you have to help improve the mathematics achievement of at-risk students?

I started the data collection process for this study once Walden IRB approval was obtained. Participants were recruited through LinkedIn, Facebook, and state-wide teacher organizational websites and did not involve a specific cooperating partner. Participants self-selected into the program via a Survey Monkey demographic questionnaire linked to the retirement flyer. The recruitment process took 5 ½ weeks, and 10 participants met the participant criteria as informed by the demographic screener. I conducted one-on-one semistructured interviews with 10 participants via audio recorded conference meetings using the recording feature within the virtual platform (see Creswell & Poth, 2018). I used a recording feature on an additional electronic device to ensure the interview data was backed up in case anything happened to the original audio recording interview. All interviews were conducted in under 60 minutes. Table 5 shows the length of each interview by participant.

Table 5

Length of Interview by Participant

Participant	Length of interview
P1	39:44 minutes
P2	27:45 minutes
P3	27:10 minutes
P4	33:38 minutes
P5	33:09 minutes
P6	35:08 minutes
P7	37:21 minutes
P8	24:04 minutes
P9	52:09 minutes
P10	59:29 minutes

Semistructured Interview Process

At the start of the interview, I reviewed the purpose of the interview, study, and answered any questions participants had. I used the interview protocol, probes, and clarifying questions used during the interviews to gain quality thick and rich data from participants as well as to redirect participants back to the original question (see Yin, 2016). Interview times ranged from 24:40 minutes to 59:09 minutes. Probes from the approved interview protocol were used to prompt participants for any further information to achieve rich, thick descriptions for data collection (see Yin, 2016). At the completion of the interview, I ensured participants had no questions and answered any questions they did have. Participants were provided with the timeframe and process in which the draft findings of this study would be disseminated. I explained the process of member checking to the participants and encouraged them to review the draft findings and share any comments with me via email (see Korstjens & Moser, 2018). Participants were reminded of privacy and confidentiality regarding their information. I thanked the participants for their time participating in my study and confirmed the participant's email address and provided them with an electronic gift card to that email address. Following each interview, I transcribed the data, any analytic memos, and notes from my field journals within 24 to 48 hours. Field journals, as recommended by Lincoln and Guba (1985), are used to facilitate making connections between the interview data and problem that was the focus of this study. All audio recordings and participant data from interviews were saved on my personal computer which is password protected. In accordance with Walden University's policies, all information will be deleted after 5 years.

Data Analysis

Data analysis is an iterative process. I used content analysis to analyze the information collected from the interviews (Bengtsson, 2016; Downe-Wambolt, 1992). Both deductive coding and inductive coding were used. Inductive coding is the process of "analyzing the text with an open mind in order to identify meaningful subjects answering the RQ" (Bengtsson, 2016, p. 10). Deductive coding is the process of. analyzing the text to look for "predetermined, existing subjects" to answer the RQs (Bengtsson, 2016, p. 10).

The conceptual framework for this study was Bruner's (1966) three stages of representation. Bruner discussed that the cognitive development of humans take place in three stages: enactive, iconic, and symbolic (see Bruner, 1966). Bruner's three stages of representation theory have been used to create the CRA framework, a mathematical framework on how students learn mathematics (see Peltier & Vannest, 2018). In the interviews, 10 participants shared their experiences with supporting the needs of at-risk students Grade 3 through Grade 5 in mathematics. Qualitative content analysis involves "making valid inferences from verbal, visual or written data in order to describe and quantify specific phenomena" (Downe-Wambolt, 1992, p. 314). During the content analysis process, I decontextualized data to identify codes, categories, and themes that emerged from the data (Bengtsson, 2016). I used the five-phase data analysis (see Yin, 2016) that consisted of : (a) compiling the information collected, (b) disassembling the information or data collected, (c) reassembling the information, (d) interpreting the information, and (e) concluding.

Coding Strategy

Compile

First, I transcribed all participants interviews from audio recordings to word documents. I re-listened to all the audio recordings and reviewed my notes to ensure I accurately captured the participant's words verbatim and to confirm that all data collected was complete and that the transcriptions were an accurate reflection of the participants' interviews (see Kekeya, 2016). After transcribing the data into individual word documents, I compiled all the transcripts into one document to make it easier for me to see the responses for participants in one place (see Bengtsson, 2016). On the same word document, I compiled my analytical memos, notes from my field journal, and reflective bracketing notes (see Saldana, 2016; Yin, 2016). At the top of the document, I typed my problem statement, purpose, and RQs to ensure I remained focused on identifying codes based on the focus of my study. After compiling all data into one place, I familiarized myself with the data (see Bengtsson, 2016) by printing out the word document and re-reading the transcripts. I used colored markers to highlight words and phrases on the hard copy of the word document that pertained to Bruner's theory on the stages of representation (see Downe-Wambolt, 1992). As I highlighted repeated words and phrases, I also used reflective bracketing and made notes beside phrases and words to help make meaning of the data (see Saldana, 2016). I then went back to the electronic version of the word document and used the highlighter feature to copy what was highlighted on the hard copy. I used the comments feature within the electronic word document to notate any bracketing notes I wrote on the hard copy. Next, I disassembled the data by looking at specific participants' responses in each transcript.

Disassemble

I used content analysis to find phrases from the data (see Downe-Wambolt, 1992) that pertained to the problem, purpose, and RQs of the study. After highlighting these phrases, I used deductive coding (see Bengtsson, 2016) to begin breaking the data into smaller pieces (see Yin, 2016). I used a Priori, a form of deductive coding, grounded in Bruner's theory on the stages of representation. The three a Priori codes identified were enactive, iconic, and symbolic, based on Bruner's theory on the stages of representation (Bruner, 1966). Table 6 provides the definitions of each stage in Bruner's theory on the stages of representation that were used as a Priori coding.

Table 6

A Priori Code Definitions

A Priori Code	Definition
enactive	The enactive stage means that thinking is based entirely on physical actions**,** and learning is by doing, rather than by internal representation (or thinking).
iconic	The iconic stage involves encoding physical action-based information and storing it in our memory.
symbolic	In the **s**ymbolic stage**,** knowledge is stored primarily as language, mathematical symbols, or in other symbol systems.

Note. From Mcleod, 2023.

I went through the hard copy of all transcripts and highlighted words and phrases within each participant's responses that related to the conceptual framework, Bruner's theory on the stages of representation. I then went through data from my field journal, reflective notes and analytical memos and highlighted words and phrases that reflected the a Priori pre-determined codes. After highlighting words and phrases using the a Priori codes, on the hard copy of the participant transcript, I copied and pasted the text excerpt onto the excel spreadsheet and inserted the a Priori code. I re-read my conceptual framework on Bruner's theory on the stages of representation to ensure the words and phrases I highlighted correlated to the study and Bruner's theory on the stages of representation. I then re-read the hard copy word document, field journal, and bracketing notes to ensure I highlighted all words and phrases related to my conceptual framework of Bruner's theory on the stages of representation. I then copied the additional text excerpts that I highlighted on the hard copy onto the excel spreadsheet and added the a Priori codes to the appropriate column related to Bruner's theory on the stages of representation. Bruner's theory on the stages of representation includes three stages that teachers should use and sequentially progress students through, each stage noted as enactive, iconic, and symbolic (Bruner, 1966). For a Priori coding, I coded 807 text excerpts as enactive code, 145 text excerpts as iconic code, and 309 text excerpts as symbolic code. In total, I coded 1,261 pieces of text using a Priori codes. Table 7 shows the total count of text excerpts from participants by each of the three a Priori codes.

Table 7

Count of a Priori Text Excerpts by Code

a Priori code	Count of interview raw data text excerpts
enactive	807
iconic	145
symbolic	309
Grand Total	1261

To conceptualize, understand and familiarize myself with the data for a Priori coding (Bengtsson, 2016), I used the spreadsheet to create pivot tables, charts, and visual aids. Figure 1 is a visual representation of the a Priori codes disassembled from the data and shows the a Priori codes derived from the text excerpts from each participant.

Figure 1

Pie Chart of a Priori Code

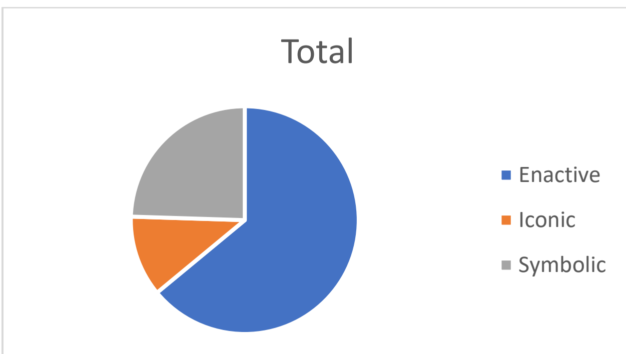


Table 8 outlines a sample of the text excerpts by participants for a Priori coding that was based on the three a Priori codes identified based on Bruner's theory on the stages of representation.

Table 8

Sampling of a Priori Codes and Text Excerpts by Participant

Participant	Text Excerpt	a Priori Code
P7	Most of the things were used in elementary school is concrete.	enactive
P1	I think going back to having access to manipulatives is crucial.	enactive
P1	I think manipulatives are going to be as close to real world as you can possibly get for students.	enactive

Participant	Text Excerpt	a Priori Code
P1	When you're starting out, you need to begin very concrete give students a chance to engage with the manipulatives.	enactive
P5	I feel that manipulatives are great, because it does give them some sort of a visual, but it is able to break down the concepts so that they can build their learning up.	enactive
P5	I'll introduce that concept, and we will start with manipulatives, and then work until they got an understanding for that manipulative, and then we will move into something that is concrete learning, that's when I start introducing [those] manipulatives.	enactive
P5	Definitely manipulatives, manipulatives are great within the classroom, because it does seem that it actually does help the at-risk students.	enactive
P6	Manipulatives definitely visual models, area models, all of that, I think, are very useful when it comes to instruction.	enactive
P6	Well, everything starts out with a visual model or some sort of manipulative.	enactive
P7	We need the kids to be able to visualize, what they're doing and so I have all kinds of manipulatives to help them with that.	enactive
P9	My perspective and experience is, first of all, I definitely think that the manipulatives are, like a key to unlock understanding for students.	enactive
P9	I really think that the visual aids, the drawings, the models, the manipulatives, to me, are the key for the kids.	enactive
P10	[Manipulatives] really allows the students to really touch math and feel math and really make sense of math; its it really helps to develop their reasoning skills for it.	enactive
P10	The concrete has to do with those manipulatives that hands on instruction, providing those tools or those resources that really give them a better feel of what is it that you're teaching from the board.	enactive
P10	Then manipulatives, again, yes, those are always beneficial for at risk students.	enactive
P3	I would say to teach at-risk students, like I was saying earlier, the concrete piece, then there needs to be manipulatives.	enactive
P1	There are things I would use, such as manipulatives, starting out very concrete with the students depending on their level and their number sense.	enactive
P3	It's not new math. It's been the math that's been there for years and trying to just teach students concretely as opposed to the abstract.	symbolic
P1	The ability to be able to draw things.	iconic
P1	The ability to be able to draw and represent things on their own.	iconic
P6	I always tell my students that a drawing or a visual model will help them be successful, because they can see it.	iconic
P9	What could we draw to show that?	iconic
P10	The representational is it's more pictorial in the sense, [that] it doesn't really involve manipulatives.	iconic

After completing a Priori coding, I started the inductive coding process that involved searching for words and phrases that participants continually repeated through the interview process (see Bengtsson, 2016). I used open coding (see Saldana, 2016) to identify additional descriptive codes from the participants' responses from the interview. I went back through the hard print copy of the word document of participants' transcribed interviews, my field journal, reflective notes and analytical memos and highlighted words, or phrases outside of Bruner's theory on the stages of representation. I then highlighted those words and phrases onto the electronic word document. I created a table and grouped the highlighted words and phrases that repeated or were similar. I re-read my problem statement, purpose, and RQs to ensure I remained focused on identifying open codes based on my study. Additionally, I re-read the Chapter 2, Literature Review, to create headings for initial open codes that were identified from the literature. Next, I re-read the hard copy word document, field journal, and bracketing notes to ensure I highlighted all words and phrases related to the literature in Chapter 2. I went through the electronic word document and based on the hard copy document, I highlighted additional words and phrases and moved them into the groups of similar words and phrases I previously grouped from the previous text highlighted. I conducted Round 1 of open descriptive coding by coding all text excerpts. There was a total of 88 open code descriptors for Round 1. I disassembled the Round 1 codes based on the RQs. For RQ1 there were 61 open descriptive codes and for RQ2 there were 27 open descriptive codes. Table 9 shows a sampling of Round 1 codes and text excerpts by participants for RQ1, and Table 10 shows a sampling of Round 1 codes and text excerpts by participants for RQ2.

Table 9

RQ1 Sampling of Round 1 Codes and Text Excerpts by Participant

Participant	Text Excerpt	Open Descriptive Round 1 Code	RQ
P9	Working with [at-risk students] in small group is something I did on a daily basis.	Instructional Strategy: Intervention- Small Group	RQ1
P5	Because I do have students that you know, because of their ability, they may learn better in a smaller group.	Instructional Strategy: Intervention- Small Group	RQ1
P4	… differentiation is helpful when being able to reach at-risk students with math .	Instructional Strategy: Differentiation	RQ1
P5	I found that the best ways to reach those struggling students have been to use differentiated activities.	Instructional Strategy: Differentiation	RQ1
P9	Definitely the differentiation, you know, when I'm planning a lesson, thinking about different processes, that we can work on different modes of.	Instructional Strategy: Differentiation	RQ1
P3	I think we need more instructional time during the day to teach math.	Need: Resource: Time	RQ1
P4	Where teachers feel as though they don't really have the time.	Need: Resource: Time	RQ1
P7	But then there are those below level students, and they could use twice the time that we have every day, we basically have 50 minutes of class.	Need: Resource: Time	RQ1
P8	I think that we have about 90 minutes set aside for math [but] some kids need more than 90 minutes.	Need: Resource: Time	RQ1
P8	[Moving on before students are ready] just keeps putting those at-risk kids further and further behind because we need to move on but they're not ready to move on.	Need: Resource: Time	RQ1
P5	I feel for many of my students who are at-risk, it is at a disadvantage, they're at a disadvantage, because many times those assessments are not on their level.	Assessment: Diagnostic/Summative	RQ1
P6	I like to call assessments each child's story book, because it tells the story of how the student is processing the information.	Assessment: Diagnostic/Summative	RQ1

Table 10

RQ2 Sampling of Round 1 Codes and Text Excerpts by Participant

Participant	Text Excerpt	Open Descriptive Round 1 Codes	RQ
P2	Bringing in that extra time trying to make sure that [students are] understanding what's going on.	Need: Resource: Time	RQ2
P8	Increasing [at-risk student's] math time.	Need: Resource: Time	RQ2
P8	If we had more time that we didn't feel rushed to teach under like our scope and sequence	Need: Resource: Time	RQ2
P1	Math instructional coaches that could come in and do lessons with us or plan with us or review data with us.	Resource: PD: Math Instructional Coach/Specialist	RQ2
P1	I think those types of professional learning where it's with somebody that's in the school, that's an instructional coach within the same school working with the same students that you're working in, I find those types of professional learning to be more beneficial.	Resource: PD: Math Instructional Coach/Specialist	RQ2
P1	And I think ongoing training with the teachers, like I was saying, an instructional coach, or somebody from the district, if there's not an instructional coach at an individual school but having that ongoing conversation.	Resource: PD: Math Instructional Coach/Specialist	RQ2
P3	I would tell that teacher to reach out hopefully, their school has some sort of support academic coach or district coach, to help um them with their students and kind of help point them toward what strategies are needed.	Resource: PD: Math Instructional Coach/Specialist	RQ2

After Round 1 of open descriptive coding, I re-read text excerpts and analyzed Round 1 codes to identify patterns and similarities within words and phrases and possible connections between the Round 1 codes. I collapsed the Round 1 codes into 11 Round 2 open codes. I created pivot tables from the data within the spreadsheet to examine, understand, and make deeper meaning of the data from Round 1 and Round 2 coding.

Table 11 shows Round 2 Codes to Round 1 Codes and the count of text excerpts by code.

Table 11

Round 2 Codes to Round 1 Codes and Count of Text Excerpts

Round 2 to Round 1 Code	Count of Interview Raw Data Text Excerpts
Attributes of At-Risk Students	150
At-risk: Characteristic: Student	125
Need: Parental Involvement: Parent Education	16
Need: Parental Involvement: Student Early Exposure to Math Content	9
Attributes of Struggling Teachers	91
Class Size	3
Factor: Lacking Support	19
Factor: Lacking: Teacher Preparation program/College	49
Factor: Teacher Stress	16
Need: Resource: Teacher Provided	4
Instructional Approaches to Support At Risk Students	102
Instructional Approach: Bloom's Taxonomy	5
Instructional Approach: Direct Instruction	23
Instructional Approach: Gradual Release	5
Instructional Approach: Project Based Learning	5
Instructional Approach: Real Life Connections	27
Instructional Approach: Scaffolding	20
Instructional Approach: Understanding By Design	3
Instructional Approach: Vocabulary	6
Instructional Strategy: Differentiation	8
Instructional Grouping To Support At-Risk Students	76
Instructional Approach: Cooperative Learning	9
Instructional Strategy: Intervention: Small Group	39
Instructional Strategy: Intervention: One on One	6
Instructional Strategy: Peer Tutoring: Effective	22
Instructional Strategies to Support At Risk Students	88

Round 2 to Round 1 Code	Count of Interview Raw Data Text Excerpts
Instructional Strategy: Differentiation	37
Instructional Strategy: Error Analysis	1
Instructional Strategy: Intervention: EIP-RTI-Teir 2	24
Instructional Strategy: Mnemonic Device: Effective	8
Instructional Strategy: Other	1
Instructional Strategy: Repetition/Reteach/Review	10
Instructional Strategy: Word Problems: Keywords: Effective	6
Manipulatives: Other	1
Supporting Struggling Teachers	308
Factor: Teacher Stress	7
Fidelity: Lacking Implementation: PD	8
Ineffective Strategies/Approaches	2
Knowing: Teacher Self Awareness	7
Manipulatives: Other	1
Need: Resource: Other	5
Need: Resource: Student Access to Manipulatives	11
Need: PD Availability	15
Need: Resource District Funding	21
Need: Resource Supplemental Curriculum for At Risk Math needs	18
Need: Resource Time	44
Resource: District Provided	5
Resource: Having Support	7
Resource: PD	6
Resource: PD: Collaborative Planning	23
Resource: PD: Collaborative Planning- Vertical Planning	9
Resource: PD: District Provided	17
Resource: PD: District Provided- Focused on Teaching Strategies	21
Resource: PD: Math Concepts	6
Resource: PD: Math Instructional Coach/Specialist	54
Resource: PD: Out of District	1
Resource: PD: Redelivery	2
Resource: PD: Teacher Provided/initiated	8
Resources: District Provided- Manipulatives	7

Round 2 to Round 1 Code	Count of Interview Raw Data Text Excerpts
Resources: District Provided- Support Staff	3
Teacher Knowledge of CRA	130
Fidelity: Effective Implementation: CRA: Manipulatives	2
Fidelity: Lacking Implementation- CRA Progression	5
Fidelity: Lacking Implementation- CRA: Manipulatives	7
Manipulatives: Counting	12
Manipulatives: Fraction	7
Manipulatives: Money	4
Manipulatives: Multiplication	3
Manipulatives: Other	4
Teacher Understanding: CRA: Drawing: Student	10
Teacher Understanding: CRA: Drawing: Teacher	6
Teacher Understanding: CRA: Manipulative	45
Teacher Understanding: CRA: Partial Progression	13
Teacher Understanding: CRA: Progression: Symbolic	12
Teacher Knowledge of Supporting At-Risk Students	148
Ineffective Strategies/Approaches	12
Instructional Approach: Real Life Connections	1
Knowing: Student	27
Need: Resource: Other	1
Need: Repeated Practice/Extra Help	8
Resource: District Provided	1
Teacher Understanding: At Risk Student Developmental Needs	56
Teacher Understanding: Mathematical Concept	42
Teaching CRA In Progression	19
Teacher Understanding: CRA: Complete Progression	19
Technology	36
Ineffective Strategies/Approaches	7
Resource: Computer Games: Effective	26
Resource: PD: District Provided: Online: Effective	3
Using Student Data to Support At -Risk Students	113
Assessment: Diagnostic/Summative	50
Assessment: Differentiation	7
Assessment: Formal	18
Assessment: Formal: Show thinking	18

Round 2 to Round 1 Code	Count of Interview Raw Data Text Excerpts
Knowing: Student	2
Knowing: Student Data	18
Grand Total	1261

After collapsing Round 1 open descriptive codes into Round 2 open descriptive codes, I reviewed Round 2 open descriptive and text excerpts and compared it to a Priori codes. In doing so, I was able to identify similarities within Round 2 open descriptive codes based on the literature and a Priori codes based on the conceptual framework of Bruner's theory on the stages of representation. I created a pivot chart to analyze both Round 2 and a Priori codes and found that the majority of text excerpts from Round 2 could be categorized as either the a Priori code of enactive or symbolic. Comparing Round 2 open descriptive codes to a Priori codes also revealed that use of the iconic stage was largely missing from participants' text excerpts from both Round 2 open descriptive code and a Priori code based on the conceptual framework of Bruner's theory on the stages of representation. Table 12 reflects Round 2 codes to a Priori codes and the count or frequency of text excerpts by code. After analyzing the data, I moved into the reassemble stage of data content analysis.

Table 12

A Priori Codes to Round 2 Open Descriptive Code and Counts of Text Excerpts

a Priori Codes to Round 2 Open Descriptive Codes	Count of Interview Raw Data Text Excerpts
enactive	**807**
Attributes of At-Risk Students	137
Attributes of Struggling Teachers	79
Instructional Approaches to Support At-Risk Students	67
Instructional Grouping to Support At-Risk Students	45
Instructional Strategies to Support At Risk Students	75
Supporting Struggling Teachers	163
Teacher Knowledge of CRA	88
Teacher Knowledge of Supporting At-Risk Students	102
Teaching CRA In Progression	1
Technology	25
Using Student Data to Support At-Risk Students	25
Iconic	**145**
Attributes of At-Risk Students	1
Attributes of Struggling Teachers	7
Instructional Approaches to Support At-Risk Students	2
Instructional Grouping to Support At-Risk Students	27
Instructional Strategies to Support At-Risk Students	2
Supporting Struggling Teachers	74
Teacher Knowledge of CRA	16
Teacher Knowledge of Supporting At-Risk Students	4
Teaching CRA In Progression	3
Technology	1
Using Student Data to Support At-Risk Students	8
Symbolic	**309**
Attributes of At-Risk Students	12
Attributes of Struggling Teachers	5
Instructional Approaches to Support At-Risk Students	33
Instructional Grouping to Support At-Risk Students	4
Instructional Strategies to Support At-Risk Students	11

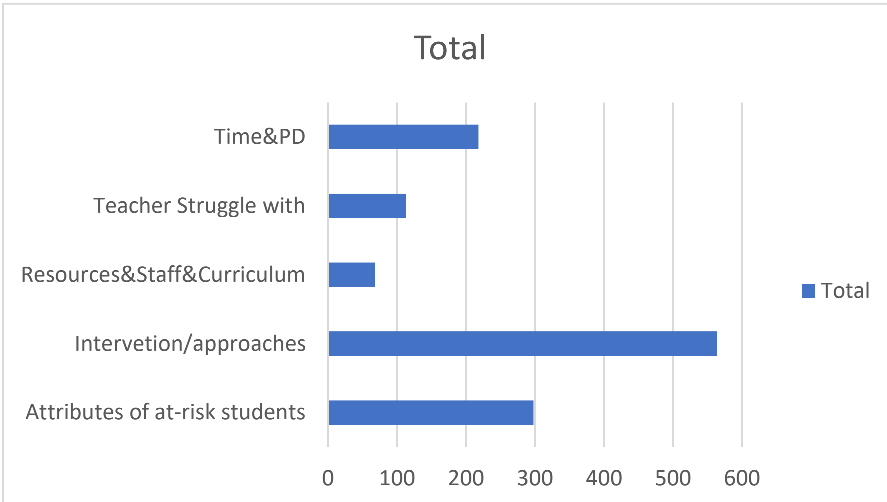
a Priori Codes to Round 2 Open Descriptive Codes	Count of Interview Raw Data Text Excerpts
Supporting Struggling Teachers	71
Teacher Knowledge of CRA	26
Teacher Knowledge of Supporting At-Risk Students	42
Teaching CRA In Progression	15
Technology	10
Using Student Data to Support At Risk Students	80
Grand Total	1261

Reassemble

During the next stage of the data analysis process, I reassembled the data. I searched for patterns within the data to see how it related to the a Priori code grounded in Bruner's three stages of representation and to the open descriptive codes (see Yin, 2016). I used the spreadsheet to refine the data through examining the number of codes. I first began with examining the a Priori codes for patterns and compared the identified a Priori codes to Round 2 open descriptive codes identified. I analyzed the data for similarities and differences using pivot tables created from the spreadsheet. I identified patterns and similarities between the two coding approaches and grouped them based on commonalities. I collapsed 11 Round 2 codes to create five categories. Figure 2 displays the categories identified and count of coded text by category.

Figure 2

Bar Chart of Categories



I created pivot tables from the data within the spreadsheet to examine, understand, and make deeper meaning of the data from the categories. I assessed the categories for patterns and similarities within the text excerpts (see Yin, 2016). I used the RQs, literature, and conceptual framework of Bruner's theory on the stages of representation to identify the main concepts that continually derived from the text excerpts and collapsed the 5 categories into four themes. The themes that emerged based on my interpretation of the categories were (a) Theme 1 is that Elementary teachers must use a range of varied instructional approaches and strategies to support the mathematics achievement of at-risk Grade 3 through Grade 5 students, (b) Theme 2 is that Elementary teachers described needing to understand the student's needs and the value of parent involvement to support the mathematics achievement of at-risk Grade 3 through Grade 5 students, (c) Theme 3 is that Elementary teachers described a lack of resources, limited instructional time, PD, lacking teacher preparation, a lack of funding, lesson planning workload, and lack of administrative support as struggles they face when trying to help support the mathematical needs of at-risk students Grade 3 through Grade 5, and (d) Theme 4 is that Elementary teachers recommend resources including additional time and personnel, changes to the curriculum, and PD to support the mathematics achievement of at-risk students Grade 3 through Grade 5. The text excerpts of Theme 1, Theme 2, and Theme 3 shared a commonality of participants discussing their experiences with instructional supports and approaches they used to support the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics. As such, Theme 1, Theme 2, and Theme 3 were used to answer RQ1 which was: What are Elementary teachers' perspectives of instructional supports and approaches, to support the mathematics achievement of at-risk Grade 3 through Grade 5 students? The common thread among text excerpts in Theme 4 was participants discussing recommendations based on their experiences in supporting at-risk students in mathematics Grade 3 through Grade 5. As such, Theme 4 was used to answer RQ2 which was: What are Elementary teachers' recommendations to support the mathematics achievement of at-risk students' Grade 3 through Grade 5? Table 13 shows the categories to themes with count of text excerpts by each category and theme.

Table 13

Categories to Themes with Count of Text Excerpts

Themes and Categories	Count of Interview Raw Data Text Excerpts
Elementary teachers describe lack of resources, limited instructional time, professional development, lacking teacher preparation, a lack of funding, lesson planning workload, and lack of administrative support as struggles they face when trying to help support the mathematical needs of at-risk students Grade 3 through Grade 5.	113
Teacher Struggle with …	113
Elementary teachers must use a range of varied instructional approaches and strategies to support the mathematics achievement of at-risk Grade 3 through Grade 5 students.	585
Attributes of at-risk students	21
Intervention/approaches	564
Elementary teachers describe needing to understand the student's needs and the value of parent involvement to support the mathematics achievement of at-risk Grade 3 through Grade 5 students.	277
Attributes of at-risk students	277
Elementary teachers recommend resources including additional time, additional personnel, changes to the curriculum, and professional development to support the mathematics achievement of at-risk students Grade 3 through Grade 5.	286
Resources & Staff &Curriculum	68
Time & PD	218
Grand Total	1261

Figure 3 displays a visual of the themes and counts of coded text excerpts and Table 14 shows the themes by RQ and count of interview raw data text excerpts. The themes that arose from these data were used to answer the RQs of this study. I reassembled the data by using the spreadsheet filters and pivot tables to observe patterns in the codes.

Figure 3

Pie Chart of Themes and Reflecting Counts of Coded Text Excerpts

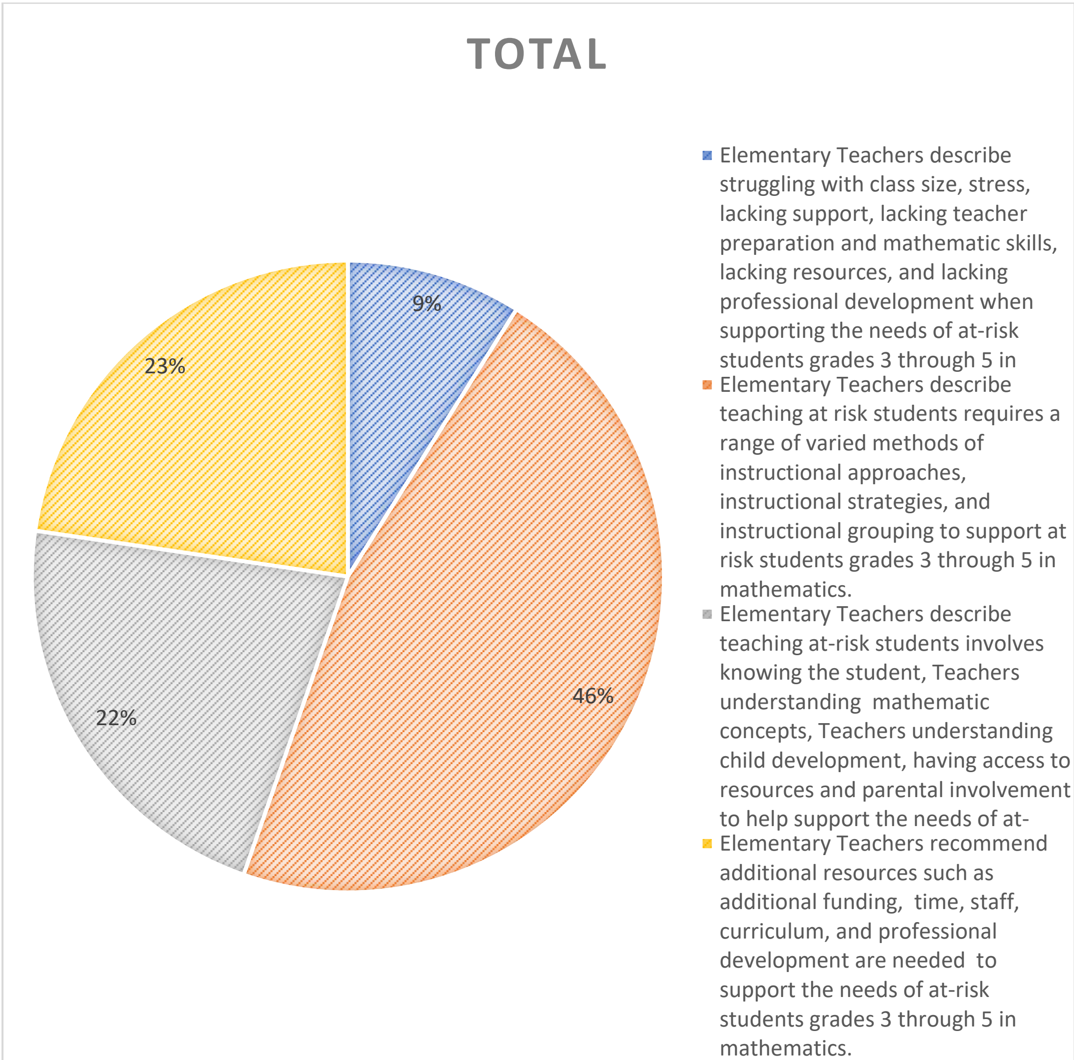


Table 14

Themes by RQ and Count of Interview Raw Data Text Excerpts

RQ	Themes	Count of Interview Raw Data Text Excerpts
RQ1	Elementary teachers describe teaching at risk students requires a range of varied methods of instructional approaches, instructional strategies, and instructional grouping to support at risk students Grade 3 through Grade 5 in mathematics.	585
RQ1	Elementary teachers describe teaching at-risk students involves knowing the student, teachers understanding mathematic concepts, teachers understanding child development, having access to resources and parental involvement to help support the needs of at-risk students in Grade 3 through Grade 5 in mathematics.	277
RQ1	Elementary teachers describe struggling with class size, stress, lacking support, lacking teacher preparation and mathematics skills, lacking resources, and lacking professional development when supporting the needs of at-risk students Grade 3 through Grade 5 in mathematics.	113
RQ2	Elementary teachers recommend additional resources such as additional funding, time, staff, curriculum, and professional development are needed to support the needs of at-risk students Grades 3 through Grade 5 in mathematics.	286

Interpret

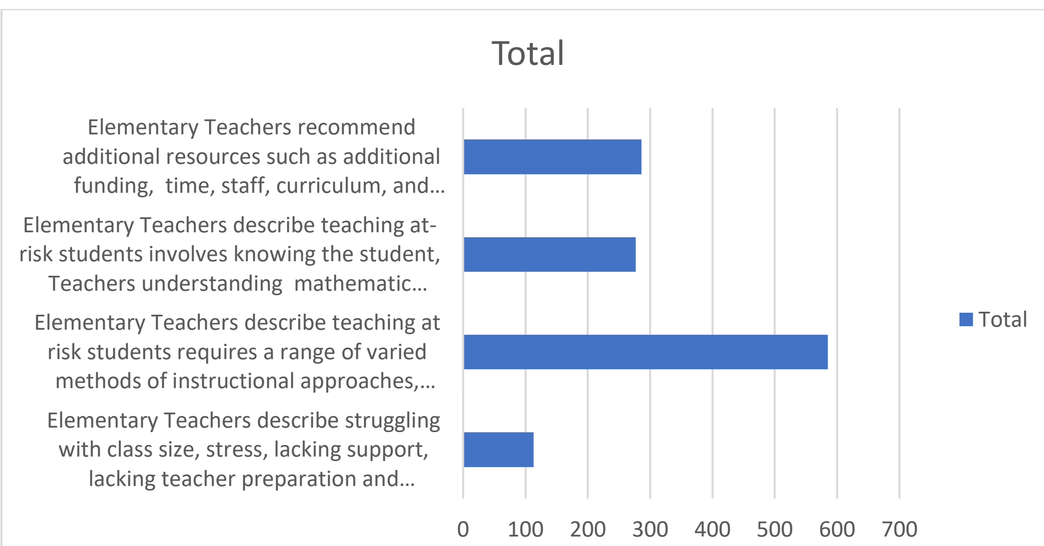
I began interpreting the data to make meaning of the participant’s experiences as it related to the problem, purpose, and RQs of the study. I used the spreadsheet to help me understand, analyze, and describe the data findings (see Yin, 2016). I disassembled and reassembled the data and organized these data within excel spreadsheets and pivot tables in different ways to ensure I had exhausted every possible theme or code within the collected information. After I interpreted the data, I created tables to illustrate and provide an accurate display of the data findings. I explored the data and determined how the emerged themes answered the RQs.

Conclude

The last part of the data analysis is conclude. In this stage I provide a narrative of the data findings (see Yin, 2016). I used the pivot tables to help me identify patterns within the themes. I looked at the frequency of the a Priori codes and open descriptive codes from Rounds 1 and 2. I examined how the themes integrated with the literature and conceptual framework of Bruner's theory on the stages of representation. Figure 4 displays the themes and counts of coded text excerpts by theme.

Figure 4

Bar Chart of Themes and Counts of Coded Text Excerpts



In this section, I discussed the findings related to the purpose of the study in addition to answering the RQs. The codes, categories, and four themes that emerged from the data are recorded in the Results section of this chapter.

Results

A total of four themes emerged during the data analysis process. A Priori coding, a form of deductive coding using the conceptual framework, and open coding were used to analyze the information collected from semistructured interviews from participants. Three themes were identified and used to answer RQ1 which was: What are Elementary teachers' perspectives of instructional supports and approaches, to support the mathematics achievement of at-risk Grade 3 through Grade 5 students? Theme 1 is that Elementary teachers must use a range of varied instructional approaches and strategies to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. Theme 2 is that Elementary teachers described needing to understand the student's needs and the value of parent involvement to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. Theme 3 is that Elementary teachers described a lack of resources, limited instructional time, PD, lacking teacher preparation, a lack of funding, lesson planning workload, and lack of administrative support as struggles they face when supporting the mathematics needs of at-risk students Grade 3 through Grade 5. In the following section I describe each of the three themes using text excerpts from participants for RQ1 and then I describe Theme 4 that emerged for RQ2.

Theme 1

Theme 1 is that Elementary teachers must use a range of varied instructional approaches and strategies to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. Findings from this study indicated Elementary teachers are required to have a thorough understanding of various instructional approaches they can use to help adequately support the mathematics needs of at-risk Grade 3 through Grade 5 students. During their interviews, participants detailed experiences with teaching Grade 3 through Grade 5 at-risk students in mathematics. Theme 1 highlights their interactions with at-risk students Grade 3 through Grade 5 in the subject of mathematics through means of using a range of varied instructional approaches and strategies primarily involving enactive, and symbolic supports to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. P8 shared for at risk students, “I think it's really a combination of lots of different strategies on lots of different types of instruction.” P7 stated that she is “trying to teach the students other ways to do things and other ways of thinking about [mathematics problems].” Participants felt teachers should use both instructional approaches and instructional strategies to support at risk students Grade 3 through Grade 5.

Instructional Approaches

Participants felt teachers should use instructional approaches such as CRA, direct instruction, gradual release, project based learning, real life connections, scaffolding, understanding by design, and the use of vocabulary to help support at-risk students’ mathematics in Grade 3 through Grade 5. One of the instructional approaches participants discussed using to help support at risk student Grade 3 through Grade 5 is CRA.

Teachers’ Use of Concrete, Representational and Abstract Stages

In this study, Elementary teachers describe their experience using CRA, an instructional approach based on Jerome Bruner’s three stages of representation that includes concrete, representational, and abstract stages when learning Mathematics. The participants in this study showed they had some knowledge of Bruner's three stages of representation by implementing the CRA instructional approach, primarily involving enactive, and symbolic supports with at-risk students Grade 3 through Grade 5. When discussing CRA instructional approach, 10 out of 10 participants share their experiences in using the CRA method to help at risk students in mathematics Grade 3 through Grade 5. P1 discussed her experience with CRA and the concrete stage using manipulatives by "focus[ing] mainly on concrete and representational to get students to be able to show their work and show their understanding of what the problem is asking of them or was asking of them to do." P6 and P10 shared their experience with CRA representation stages in drawing. P6 shared their experience with CRA representational stage saying,

> I always tell my students that a drawing or a visual model will help them be successful because they can see it. And most of the students I have learned, I think the teacher has to know, are visual learners, so they need something visual to help them grasp certain, concepts such as fractions.

P10 shared that "showing them how they can draw a representation of what's happening in the math word problem that they're reading about....[helps them], so that way they can have a better understanding of what is happening and what they can do."

While all participants discussed teaching using components of CRA, only five out of 10 participants describe moving sequentially through all three stages of CRA when teaching Grade 3 through Grade 5 at-risk students' mathematics. P1, P3, P8, P9, and P10 all described the process of teaching students' mathematics using the CRA method in sequential order as a necessity to learning mathematics, as one stage builds upon another. P1 shared that:

> I use manipulatives, starting out very concrete with the students depending on their level and their number sense. And then moving to more representation where they would be drawing things out discussing things explaining things, and then moving into more abstract.

When discussing how to move students from concrete to abstract within the skill of multiplication, P3 shared,

> I want them to understand it first, and kind of discover it in their way and determine, to figure out area, if I put all these foam tiles on here. I can figure out area and then I can say that looks just like an array. And now I can figure it out the area is just multiplication as opposed to teaching them areas length times width, having them discover it.

P8 shared, “Definitely, you're going from using manipulatives, and a lot of strategies such as drawing, but then you do have to move into the algorithm.” When explaining how to move students from concrete to abstract, P9 shared,

> I always try to start with concrete, right, like and move it from concrete to, like you said, the representational and then like, the drawings, and then to the abstract. I really believe in the … the CPA, like concrete, pictorial, abstract model. I would just stress that, if you're skipping the concrete understanding of some math concepts, and you're just trying to go right to the more abstract things without

> building that conceptual foundation then you're like building a house on sand, the [students] have to understand conceptually, what is happening.

P10 explains the end goal of moving students sequentially using the CRA method from concrete to drawings, to abstract is that:

> …once students get to the abstract, that they're able to have a toolkit or a mental toolkit, in which they're able to go back to what they remember from their concrete examples; They [students would also have] their representational examples to help them to answer abstract questions.

While participants in this study believe CRA is imperative to building a solid mathematical foundation, participants also discussed the importance of using instructional approaches, such as direct instruction and gradual release, to implement CRA within classroom instruction.

Direct Instruction and Gradual Release

In this study, Elementary teachers described direct instruction and Gradual Release as instructional approaches to help support Grade 3 through Grade 5 at-risk students in mathematics. Four out of 10 participants described direct instruction as an instructional approach they use to help support Grade 3 through Grade 5 at-risk students in mathematics. P10 shared that when using fully guided direct instruction, there is some mathematical modeling that is taking place where, “I am showing them how I'm thinking, how I am critiquing, what I'm thinking, how I'm evaluating, and how I'm doing those processes.” P9 shared that, “Direct instruction is something that we do every day.” Two out of 10 participants described gradual release as an appropriate instructional approach to use to help support Grade 3 through Grade 5 at-risk students in mathematics. P9 shared "another strategy that I would use is gradual release strategy; I do, we do, you do, was one [strategy] I used a lot. I usually have a few kids do a problem or two, so I can see whose kind of picking it up." P1 discussed gradual release in connection with moving students throughout the three stages of representation, saying:

> Once you see that they are being successful with-solving problems with manipulatives, you gradually release. You're removing the manipulatives, and you're having them draw, model, draw their own models, and work in pairs to help each other and assess each other. Then from there, hopefully they've built those strategies and things have become more like second nature for them at that point, as they would then progress into more abstract concepts.

In addition to discussing instructional approaches that are used to deliver instruction, participants in this study also acknowledged the importance of using varied instructional approaches to engage students within instruction.

Bloom's Taxonomy, Cooperative Learning, Project Based Learning, and Real-Life Connections

In this study, Elementary teachers described using additional instructional approaches to support at-risk students Grade 3 through Grade 5 in mathematics that also included: Bloom's Taxonomy, cooperative learning, project based learning, real life connections, scaffolding, Understanding by Design, and the use of vocabulary. Two out of 10 participants discussed Blooms' Taxonomy as an appropriate instructional approach to help support Grade 3 through Grade 5 at risk students in mathematics. P6 shared the importance of “[making] sure that I'm intentional about higher order thinking questions and then move into more abstract thinking, high order thinking questions, and performance tasks.” P4 shares her experience with Bloom’s Taxonomy regarding “[students] being able to learn and remember and recall those different formulas for geometry and measurement.” One participant shared using cooperative learning as an instructional approach. P5 shared that working “in a cooperative community where they are, working together and they can rely on each other to test out questions to try to provide written answers to an exercise.” Two participants, P5 and P6, shared their experiences using project based learning as an appropriate instructional approach to help support the mathematics needs of students Grade 3 through Grade 5. P5 shared her experience using project based learning with at risk students as an extension for “once they've mastered it [the skill] we start allowing them to start working on project based learning.” On the other hand, P6 discussed using project based learning with all students to make connections with subjects by trying “to find a project-based learning project that speaks to what we could use fractions for.” While all participants alluded to the importance of making connections with at-risk students to help support the mathematics needs of Grade 3 through Grade 5 at risk students, only one participant directly discussed using real life connections as an appropriate instructional approach to help support at-risk students in mathematics. P2 shared a real-life connection example she would use to help teach at-risk students mathematics. P2 shared:

> For instance, if I go into the store with $100, what can I buy with that $100? This is the cost of the item. How many times can I buy that? So just really, you know,

> breaking it down into a way that it's hitting in their mind bringing it more real-life aspects instead of just throwing it up and saying, Sally bought this many? What can she get? Changing it up and putting the student in our problem instead of just reading it all together?

Participants in this study discussed instructional approaches to help engage students within instruction, and they also discussed the importance of supporting students within instruction with instructional approaches such as scaffolding, understanding by design, and using vocabulary.

Scaffolding, Understanding by Design, and the use of Vocabulary

Three out of 10 participants directly discussed the use of scaffolding as an appropriate instructional approach. P3, P5 and P7 shared that they scaffold their students' work to help break it down into more steps. P7 also shared "if they [students] have a gap, and they're not getting what you're trying to teach in your grade level, you've got to take that student down to the previous grade level standards." P5 shared that scaffolding was used within the classroom "because you have students that you may have to do a lot of scaffolding with, in order to allow them to catch up with other students." Only one participant, P10, discussed using Understanding by Design as an instructional approach to help support the mathematics needs of at-risk students Grade 3 through Grade 5. P10 shared that

> [The] first one that you really need to start off with is Understanding by Design because with Understanding by Design, what you're doing is your backwards

> planning. So, you're keeping the end in mind, the end product, and then you're working back to determine how much time is needed.

Two out of 10 participants discussed teaching vocabulary as an instructional approach to help support Grade 3 through Grade 5 at risk students in mathematics. P5 shared “I start with vocabulary, because vocabulary is going to be a huge part of their learning.” Additionally, P5 recommends teachers should reinforce the vocabulary. P10 shares using vocabulary in conjunction with CRA representational stage of manipulatives “to have a visuals of the vocabulary…so with every student you can still use vocabulary, picture cards.”

In this study, participants described the importance of utilizing instructional approaches to help support at-risk students but also emphasized the importance of knowing students and choosing strategies to help effectively implement instructional approaches. P10 shares that after applying instructional approaches, they will devise ways [such as strategies] to deliver the instruction to the students that they understand.

Instructional Strategies

Participants felt teachers should use instructional strategies such as instructional grouping, peer tutoring, repetition, and differentiation to help support at-risk students’ mathematics in Grade 3 through Grade 5. One of the instructional strategies participants discussed using to help support at risk student Grade 3 through Grade 5 is instructional grouping. Eight out of 10 participants described using instructional grouping as a strategy that at-risk students need to be successful in mathematics. These participants believe that instructional grouping should be based on the students’ ability level and needs based on the concept being taught. All eight of the participants who discussed instructional grouping attest that instructional grouping is a strategy that should be utilized daily. P9 shares that small grouping “is something I did on a daily basis.”. Eight out of 10 participants in this study discussed various instructional grouping formats that they have experience utilizing to help support the mathematic needs of at-risk students, such as small group, one-on-one, and Early Intervention Program (EIP) or Tier two instruction.

Instructional Grouping

All eight participants who discussed using instructional grouping as an instructional strategy agree that it is necessary to provide further instruction within a small group to students who are still struggling with concepts after whole group instruction has been delivered. P5 states that “I definitely have small group time, in addition to whole group instruction…for those students that are still struggling…because I do have students, because of their ability, they may learn better in a smaller group.” P6 believes that small grouping also allows the teacher to “do a lot of differentiation in small group instruction” to help better support the needs of at-risk students. P5 believes that instructional grouping is an effective strategy because when “we are able to get in small groups, we are able to do activities that are on those struggling students’ levels.” P2 believes that grouping them into small group instruction allows the teacher to group together groups of kids who are having a hard time on the same concept and then to find a way to really break down and focus on that concept.

While five out of eight participants discussed instructional grouping in terms of small group as an instructional strategy, four out of the eight participants further expounded on providing more intensive instructional grouping such as one-on-one instruction to further support at-risk students in the subject of mathematics. These four participants described one-on-one instructional grouping as a teacher-led group that consist of just the teacher and student in need of further help understanding a concept. P1 believes that one-on-one instructional grouping can help in "trying to bridge the gaps". Eight out of the 10 participants that discussed instructional grouping as an effective instructional strategy all described the settings of these instructional groups as teacher led with the exception of one participant.

Four out of those eight participants also mentioned cooperative grouping as a form of instructional grouping. P10 states that cooperative grouping is used in the form of "learning stations or centers [that] will reflect whatever the students are doing." P1 also discussed cooperative grouping as an effective instructional grouping and instructional strategy and believes that grouping students in heterogeneous groups within a classroom works better than using homogeneous grouping because heterogeneous grouping allows students to learn from one another. P1 does believe that while using cooperative heterogenous grouping is an instructional strategy, teachers should "watch to make sure that it's not one student in the group that is doing all the work and that everybody is…taking responsibility and participating in [the group] as well." On the contrary, P5 believes that instructional grouping should consist of homogeneous grouping where peers are performing on or around the same level as them is an effective instructional strategy.

Eight of the 10 participants discussed instructional grouping as an effective instructional approach. P1, P4, P6, P8, P9, and P10 all further explained the importance of having Tier 2 instruction also known as EIP services as an effective form of instructional grouping. P10 explains that Tier 2 or EIP services is an effective instructional strategy as it is designed to “address the prerequisite skills that a student has not shown proficiency in based on the grade level that they have just entered in.” P6 and P9 both affirm that it’s important to know when a student really needs to be moved to Tier 2 to receive additional EIP instruction and services. P6 explains that when a student is “severely at-risk, [and] really need an intervention… that's where the [Tier 2] support comes in.” P8 attests that the ideal situation for instructional grouping is to have the EIP services in conjunction with regular mathematics classroom instruction. P8 believes that both EIP services of pushing into the classroom and pulling out of the classroom are effective; however, P8 does contest that the most ideal way to implement EIP services is when the students are being pulled out. P8 explains that when EIP services are pull out method, the EIP teacher pulls students out of class in a small group setting instead of coming into the classroom to assist the student during mathematics instruction. P8 describes this type of service as double dipped because students receive both instruction from an EIP teacher and then come back to the classroom to receive regular math instruction from their teacher. On the contrary, P3 believes that when students are pulled out of the classroom for EIP services, then [the student will] never catch up, because they're missing their grade level appropriate [instruction]. While eight out of 10 participants discussed instructional grouping as an instructional strategy to support at-risk students, participants in this study also discussed students helping students via peer tutoring as well.

Peer Tutoring

Seven out of 10 participants discussed using peer tutoring as an instructional strategy to help support the needs of Grade 3 through Grade 5 at-risk students. P1 and P2 shared positive experiences using peer tutoring with at-risk students. P1 stated that peer tutoring can be "extremely beneficial." P2 also believed that peer tutoring can be helpful for students who are really struggling because it gives them the opportunity to [work] together on their assignments [with other students]. P2 also believes peer tutoring allows "[students], who are stronger in a subject, to help out their friend" and it "feels more like they are hanging out than doing assignments." P2 also stated that peer tutoring not only helps the tutored but also the student doing the tutoring as it helps them feel empowered to know that they are helping to pull up the other student. Likewise, P8 stated that "working with peers definitely helps at risk students seeing it from a different perspective." P8 also stated that peer tutoring is an instructional strategy that helps students "talk to each other and make them understand better than a teacher can." P10 stated that peer tutoring is great because it helps to reinforce that learning pyramid and reinforcing that students did learn the concept. P10 believes that when students can teach another student, then [peer tutoring] can have a 90% effect as far as the retention of the student that is acting as the teacher." P9 stated that peer tutoring can help at-risk students when the way the teacher is explaining things is not "clicking with the kids, and then I'll have a friend show them and for some reason that clicks." While peer tutoring can be used to help support the needs of at-risk students, participants in this study also provided their experience on characteristics to look for when partnering students together for peer tutoring.

Participants stressed the importance of looking at the characteristics of students who will be issuing the tutoring to their peers to ensure peer tutoring is most effective for the student in need of assistance. P9 states that they use “those students who have the patience and personality to be a good peer coach”. P1says you should look to pair students that work well together, where the students that is lower performing does not feel afraid to take risks, or to get the answer to a problem wrong. It helps to have a low stress, low risk environment when working with a peer, that is extremely important for [peer tutoring] to be beneficial. Likewise, P7 shared reservations with peer tutoring because peer tutoring students should be paired with “a higher student with a lower student” but in doing so the drawback is that the lower student may not always understand what the higher student is saying. While participants still believed peer tutoring can help to support the needs of at-risk students, participants in this study also believe that repetition is an important instructional strategy as well.

Repetition

P4 stated that “remediation should look like making sure that students have the foundation.” Therefore, as P5 expressed, remediation should be when a teacher will keep “reteaching [a topic] until [students] are able to master those skills.” P8 explained that when working with at-risk students in mathematics it takes “a lot of instruction and [the teacher having to] reiterate…to go over concepts very frequently…[it takes] a lot of review” for at-risk students to grasp concepts. P8 further explained that “the bridge [to helping at-risk students learn] would have to be constant repetition, to [continuously] reteach [and] to find a strategy that you can connect the hands on to the abstract.

Similarly, P4 discussed remediation is an instructional strategy that should be used "year-round" instead of just being "done at the end of the year." P6 expressed that remediation should also drive the teacher's instruction and "focus as far as if majority of my students are not getting something, then I know I need to reteach the whole class." Participants in this study discussed the importance of repetition to help support at-risk students but they also discussed the importance of varied methods of differentiation to help reach at-risk students.

Differentiation

Six out of 10 participants discussed differentiation as an instructional strategy they used to help support at-risk students Grade 3 through Grade 5 in mathematics. Participants P2, P4, and P9 all stated they believe differentiation is imperative for at-risks students. P4 stated that "differentiation is helpful when being able to reach at-risk students with math". P5 also stated "I would say that I found that the best way to reach those struggling students have definitely been to use differentiated activities." P9 believes that "[the teacher has] to do differentiation every day". P5 stated that working with differentiated materials "allows all students to be able to master the concept but…they are doing it [in] different ways". P10 believed that differentiation instruction "makes the learning environment more conducive for students. The participants detailed several methods of differentiation they used to support at-risk students in mathematics, such as:

graphic organizers, error analysis, using strategies to assist with solving word problems, and mnemonic devices.

P10 and P3 discussed using graphic organizers and visual aids to help support the mathematics needs of at-risk students. P9 uses error analysis as a differentiation strategy to help students feel more comfortable with math and making mistakes. P9 states:

> I do let them point out mistakes I make because I'm a human, I make them a lot. And then we kind of just show right at the beginning, it's totally fine to make mistakes, because I do it all the time.

P8 discussed using mnemonics to help at-risk students remember mathematical steps especially when conducting topics such as order of operations. P5 and P9 both discussed using mnemonics to help at-risk students when working with word problems.

Additionally, P5, P8, and P9 all discussed using mnemonics as a form of differentiation to help support the needs of at-risk students remember mathematical concepts. P5 stated when working with word problems, mnemonics help [students] break down the word problem, so that they can go about answering it. P9 stated that if they want at-risk students to remember mathematics skills, they use mnemonics. P9 stated that they use the mnemonics with word problems [for the] cube strategy, so that [students] can remember the steps with that problem solving strategy. In addition to mnemonics to help support at-risk students with word problems, P6 also discussed using keywords to help support at-risk students with problem solving word problems.

For this study, Theme 1 covered participants describing their experience supporting at-risk students Grade 3 through Grade 5 in mathematics by using a range of varied instructional approaches and strategies to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. As such, Theme 2 will cover Elementary teachers describing the importance of understanding student needs, and the value of parent involvement to support the mathematics achievement of at-risk Grade 3 through Grade 5 students.

Theme 2

Theme 2 is that Elementary teachers described needing to understand the student's needs and the value of parent involvement to support the mathematics achievement of at-risk Grade 3 through Grade 5 students.

Understanding Student's Needs

Participants in this study believe that to support at-risk students in Grade 3 through Grade 5 in mathematics teachers need to take the time to understand student needs. Participants discussed several ways to understand student needs such as: getting to know their students through student's likes, student data, and things their student may be struggling with. Five out of 10 participants discussed the importance getting to know your student has on being able to support at-risk students Grade 3 through Grade 5 in mathematics. P1, P2, P6, P7, and P10 all agreed that taking time to get to know about their students and make connections help set a better foundation in which the teacher could teach mathematic skills to at-risk students. P2 discussed that teachers need to "really [focus on finding out] what [the student] connects with" and getting to "really know our kids, because not every kid is going to be the same". All five of these participants concur that getting to know your student aids the teacher in knowing which instructional approach and/or instructional strategies are most appropriate to support the student in learning mathematics concepts. P1 stated you have to really know your students, and “knowing your kids and [which approach or] combination of those approaches” to use to help support the student. Likewise, P2 discussed “bringing [into your teaching] everything that [the students] like to [try and make sure that this [mathematical] information connects with our students. P2 also talked about “really just finding something that clicks if this kid really likes interactive games, implementing it more in your teaching” as a means to help support at-risk students learn mathematics. P2 also discusses the ramifications of not getting to know your kids as a “barrier” and it can prohibit teachers from helping students to find that “aha moment”. P10 believed that teachers knowing their student aids in making learning about math fun because teachers can bring into their lesson components that appeal to the student’s interests and can explore mathematical concepts based on the teacher’s “understanding of the functionality of that student.” In addition to getting to know the students’ likes, participants also discussed using student data as a means to get to know students and help support the mathematical needs of Grade 3 through Grade 5 at-risk students.

Eight out of 10 participants discussed the importance of using student data as a means to help support at-risk students Grade 3 through Grade 5 in mathematics. P8 stated that data “gives us some background information on the student.” P6 stated that data is the “biggest resource that I've been able to use” in my classroom. P1 discussed that knowing student data is important as it shows “how a student is performing and what their understanding and where their misconceptions may lie.” P9 stated that data from assessments are about guiding instruction. Participants P1, P2, P3, P5, P6, P8, P9 and P10 all believe that to help a student, the teacher should know several pieces of data of a student and not just a singular piece of data. All eight out of 10 participants agreed that while assessment data is necessary in understanding and supporting at-risk students in mathematics, assessment data is not always going to show the student's true ability because it is just a snapshot of what the student knows based on that one day. P2 discussed that sometimes a student's data "may be a little off…because [the] student may be tired, or students may have something going on in their personal life." As such, all eight out of 10 participants discussed using various data points and data collection pieces to fully understand what the student is capable of. P2 discussed that applying the assessment data to "what you know about the student" is a great way to help get to know what a student is capable of. P6 discussed that student data is important as it can show which students struggle and may be struggling with based on …their data [and] what the data is showing. me." P1 discussed knowing a student's data on a regular basis as student data can change "from day to day." Similar to using student data to know a student, participants also discussed the importance of knowing a student's struggles and deficits to help support at-risk students Grade 3 through Grade 5 in mathematics.

Nine out of 10 participants discussed understanding the struggles and deficits of at-risk students is critical to help support at-risk students Grade 3 through Grade 5 in mathematics. Participants P1, P3, P4, P5, P6, P7, P8, P9 and P10 all discussed students struggling with reading as a main deficit that they see among at-risk students Grade 3 through Grade 5 who are struggling with mathematics concepts. P10 stated that a student's "literacy gaps affect their math proficiency" which in return "puts [students] even further at risk" in mathematics. P5 stated that "I have students who are definitely struggling to read" and as a result of their reading deficits, they are "overwhelmed just reading the word problems" in math. Likewise, P1 also discussed students' reading deficits negatively affecting their mathematical abilities. P1 stated: when [a student is] given a word problem, for example, they're not able to comprehend what the problem is asking them to do, so they're not sure where to begin" or how to solve the mathematical problem. P10 also discussed the effect at-risk students' deficits in reading have on their mathematical abilities. P10 stated:

> Math has come to a place in which there's a lot more reading that is integrated in mathematics. It is not just abstract and just looking at numbers, but it is reading word problems or mass scenarios or, as I like to call them, math stories.

As a result of students having deficits in reading, P3 discussed the importance of teachers knowing students so that they will be better suited to figure out if the student's struggles are attributed to whether the student is "not understanding the math or they're not understand the reading comprehension that goes along with it".

Participants in this study also believe that students struggle with foundational skills. P1 stated that when at-risk students lack number sense, it's "going to have an impact on whatever skills [the student is] trying to work on." P8 listed several topics that at-risk students developmental struggle with such as knowing those math facts, whether it's addition, subtraction, or multiplication, and subtraction with regrouping. Additionally, P2 discussed that at-risk students tend to struggle with Fractions. P2 stated that if an at-risk student “cannot multiply and divide, it's going to be hard to… do fractions where [the student will] have to multiply and divide fractions for having to do common denominator.” P3 also discussed students lacking fundamental skills such as decomposing numbers, which is a kindergarten standard. Likewise, P7 stated that if a student does not know how to “count on a one-to-one ratio, then [the student is] going to have a problem adding, [and] if [a student] cannot add then multiplying is definitely not going to make any sense” to that student. While all participants agreed that in order to help support at-risk students Grade 3 through Grade 5, participants in this study also agreed parental involvement is important to help supporting Grade 3 through Grade 5 at-risk students in mathematics.

Parental Involvement

Participants in this study believe parental involvement is important to help support at-risk students in Grade 3 through Grade 5 in mathematics. Five out of 10 participants discussed parental involvement as a vital component to being able to support at-risk students Grade 3 through Grade 5 in mathematics. P1 stated that “I think parent education is very important” and P8 stated that [teachers] “definitely need parents support with the at-risk student.” Additionally, participants agreed that it is important for students to have support at home to receive assistance and reinforcement with mathematics topics. P8 stated that parents should be able to help students with their homework and should know “exactly what the child’s deficiencies are.” While participants discussed the importance of students receiving support at home with mathematics topics, two out of the five participants that discussed parental involvement cautioned against parents helping to support students without understanding mathematics concepts themselves. P3 asserted that teachers should:

> focus on trying to get parent involvement, so [teachers can] teach parents how to teach their children what was happening in the classroom, just to kind of help them support their children at home and reinforce the same strategies that are being taught in the classroom.

P7 stated “most parents were taught the standard algorithm and we're trying to do away from that”, so parents will teach their child the standard algorithm and when the student comes back to school they want to “jump to the standard algorithm,” because that’s the way their parents said to do it. So, in this case parents helping students is not “really helpful”. P1 discussed a remedy to parents teaching their child outdated or incorrect ways of solving mathematical problems is to provide parent education. P1 stated that “parents are a children's first teacher” so,

> providing that education early on with families so that…when [students] begin more formal schooling in kindergarten, they already have a leg up so to speak, as opposed to, coming in and not having had that exposure.

P1stated the importance of “looking at very young students, even preschool age, [and] how we can start engaging families in the community that have young students.” P1 believed that it’s important to get “those families [to understand that] educating [parents] on how best to help their students, even before formal schooling begins, can be to help build a mathematical foundation for the student. P9 discussed that providing children with early exposure in mathematics can have students starting preschool better prepared.

P9 has experience with "the kids that do not attend preschool still coming into school fairly strong because their parents worked with them a lot." As such, participants in this study believed that parental involvement, along with knowing the student's needs is imperative to helping support the needs of at-risk students Grade 3 through Grade 5 in mathematics. Theme 2 focused on the experience participants had with knowing the students' needs and the importance of parental involvement. In Theme 3, participants described struggles teachers experience while helping support the mathematics needs of at-risk students Grade 3 through Grade 5.

Theme 3

Theme 3 is that Elementary teachers described a lack of resources, limited instructional time, PD, lacking teacher preparation, a lack of funding, lesson planning workload, and lack of administrative support as struggles they face when trying to help support the mathematics needs of at-risk students Grade 3 through Grade 5.

Lack of Resources

Participants in this study cited struggling with a lack of resources when trying to support the mathematics needs of at-risk students Grade 3 through Grade 5. Seven out of 10 participants in this study discussed a lack of resources as a struggle Elementary teachers Grade 3 through Grade 5 face when trying to support the needs of at-risk students in mathematics. P1, P5, and P7 all discussed needing more manipulatives within the classroom to efficiently help support the needs of at-risk students in mathematics. P5 stated that "additional resources that I would need within my own classroom, [would] definitely be more manipulatives." P1 stated that lacking manipulatives within the classroom "has a negative effect on [students], because some of [the students] greatly need those manipulatives in order to build on their learning. P1 also asserted that there is a need for manipulatives by stating "I definitely needed manipulatives to reinforce fraction skills, basically any type of measurement skills. Other manipulatives that I needed in the classroom, I would say maybe dealing with numbers sense. I would definitely say number sense we needed manipulatives." P1 further expounded on how lacking manipulatives in higher grades can also have a negative effect on at-risk students learning mathematics skills. P1 stated:

> I think that [lacking manipulatives] could be one of the issues that these middle schoolers are facing. Not having access to those manipulatives to be able to touch and move things and help have a concrete model that they can manipulate.

Additionally, P1 continues to discuss how lacking resources not only negatively affects the students learning, but it also negatively affects teachers, because this is something we want our students [to have] to be able to perform well. "But we're in a position where we have to provide those resources for them if we want them to have it." P7 discussed having to write "a grant for manipulatives… just trying to get my kids" the resources they need. P7 believed that "if I hadn't written the grant for the resources and received it, then that would be something I say we need more of …is resources [such as] manipulatives.

Lastly, P10 stated that "definitely more manipulatives, more tools" are needed within the classroom to help support the needs of at-risk students in mathematics. P10 discussed that manipulatives not available for each teacher within the school so "we have a set of manipulatives that we have to rotate between different classes and different teachers." In addition to struggling with lacking resources, participants in this study discussed limited class time with students as a struggle they face when trying to support at-risk students Grade 3 through Grade 5 in mathematics.

Limited Instructional Time

Participants in this study discussed needing more class time with at-risk students as a struggle they face when trying to support at-risk students Grade 3 through Grade 5 in mathematics. Six out of 10 of the participants detailed their experiences with limited classroom time to teach mathematics with at-risk students. P4 stated that "teachers feel as though they don't really have the time" to teach mathematics. Similarly, P3 stated that "I think we need more instructional time during the day to teach math." P9 expressed how limited time within the classroom is a struggle which can negatively affect how teachers teach. P9 stated that limited class time with students is a struggle especially when teaching mathematic concepts with "large numbers, because it's time consuming, and we as teachers feel the crunch of time all the time." P8 explained that "we have about 90 minutes set aside for math [but] some kids [such as at-risk students] need more than 90 minutes." P8 further explained that in addition to needing more instructional time to teach mathematics, teachers need to be given more time to teach specific standards. P8 stated that teachers are "only [given] about maybe 2 weeks to teach certain standards, and you have to move on, [but] some kids aren't ready to move on from certain standards after 2 weeks." P8 asserted that the lack of time within standards:

> just keeps putting those at-risk kids further and further behind because we need to move on, but yet they're not ready to move on. We're only given about a week and a half to teach it. We've got to move on after that. So, time is not on our side.

P8 described feeling that teachers have "no choice but to move on" even if "a kid's not understanding or mastering that standard" because the scope and sequence only allots a specific time for teachers to teach those standards to students. P8 explained that teachers must give students "assessments at the end of the quarter" on "all of those standards…within that scope and sequence within a timeframe." Knowing students will be tested by the district on this information creates stress for teachers because of the limited time teachers have to work on specific standards before they have to move on, regardless of if the student understands the concept or not, in order to cover all the standards that will be on the district assessment. While some participants discussed struggling with limited class time, participants in this study also discussed PD as a struggle they face when trying to support the needs of at-risk students Grade 3 through Grade 5 in mathematics.

Professional Development

Participants in this study discussed struggling with various aspects of PD when trying to support the needs of at-risk students Grade 3 through Grade 5 in mathematics. Participants P4, P5, P6 and P9 all expressed their struggles with adequate PD for mathematics. P5 discussed that PD is based more on data but needs to be based more on mathematical strategy or mathematical skills. P5 believed that PD should:

> [equip] teachers with more tools in their toolbox, so that, each year as they get a new group of students, they're able to figure out where to meet those students where they're at from the very beginning, because they have a toolbox of resources and strategies that they can use. And they know how to approach those students right from the very beginning of the school year whenever that student enrolls.

Similarly, to P5's assertion of having more PD specially focused on instruction, P6 stated that "I do think there needs to be more PD geared around how you support at-risk students." P9 also provided insight into struggling with PD that does not provide teachers with specific skills they can use within the classroom and the desire to have PD that will show teachers specifically what to do when they are teaching students who are struggling. P9 also discussed struggling with implementing certain instructional strategies such as intervention and peer tutoring because of a lack of PD on those topics. When discussing interventions P9 stated

> I always struggled with interventions that went beyond kind of the basics…. I could do interventions for kids who maybe were struggling to just remember some basic math facts, but then….when kids… were struggling with more problem solving, I always felt like, I didn't get enough training and support in how to help students with those types of interventions.

When discussing peer tutoring P9 stated "I feel like I don't know that I ever had training on how to use students as peer coaches, I think that's kind of just trial and error."

Additionally, P9 stated that PD discussing implementing “Tier 2 and three strategies” with struggling students was lacking as well.

Inadequate Teacher Preparation

In addition to discussing struggles with PD, participants in this study also discussed struggling with feeling unprepared due to inadequate teacher preparation programs. Four out of 10 participants discussed teachers lacking the proper preparation before entering the classroom as a struggle that negatively affects at-risk students Grade 3 through Grade 5 in mathematics. P3 discussed that some college preparation programs do not teach in depth “the pedagogy and theory for mathematics like how literacy is taught [in depth].” P3 also asserted that college math programs do not always provide in-depth instruction on how teachers can teach specific topics to students who are struggling. Additionally, P3 stated that colleges teach more of “teaching strategies” than actually teaching the skills “necessary and how you can teach students” those mathematics concepts. Additionally, P3 believed that “college courses don't really teach…how to move from the concrete representational to the abstract for when you're teaching math strategies.” P5 also asserted that college preparation programs may not adequately prepare student teachers in “training in math skills, the conceptual skills” needed to help support at-risk students. P2 also discussed it being “hard” for newer teachers coming out of college to try and figure out ways to help struggling students in mathematics. In addition to discussing inadequate teacher preparation, participants in this study discussed the stress of dealing with other various struggles when trying to support the mathematics needs of at-risk students Grade 3 through Grade 5.

Additional factors that contribute to participants in this study struggling to support the instructional achievement of at-risk students Grade 3 through Grade 5 in mathematics are: a lack of funding, lesson planning workload, and lack of administrative support. P8 stated that “if your school doesn't have the money to support [resources students need], it's all left on the classroom teacher, which creates a lot of stress.” An additional stressor a participant in this study discussed was the additional workload that comes along with teaching at-risk students versus students who are not identified as at-risk. Participant P10 stated: that lesson plans are “a huge stress factor when working with at risk students” due to the additional elements that must be included in instructional planning to effectively support the additional needs of at-risk students. P10 discussed that lesson planning can be “stressful because it can be very time consuming”. P10 stated that teaching at-risk students in mathematics can be more stressful due to the

> extra work that teachers are having to do physically, mentally, emotionally, [and] spiritually…when they are working with at risk students, compared to teachers who do not work with at risk students… [and] It's just so much it can be so much more stressful.

Additionally, participants P3, P7, P9, P10 all discussed lacking the support of administration as a stressor when trying to help support at-risk students Grade 3 through Grade 5 in mathematics. P7 discussed lacking administrative support from the perspective of working in a smaller school district. P7 stated that due to the school district being smaller than most, there are not a lot of teachers who teach in the same position and grade. As a result, P7 discussed the lack of support on a teacher level, and an admin level.

P7 stated that “there's not a lot of support…because our school is so small” and since the principal has not “taught fourth and fifth graders math….[the principal] can't be very helpful.” P10 also mirrors the sentiments of P7 by stating that administrators “need to be not just a business manager, but an instructional leader.” Similar to P7 and P10s assertion on lacking administrative support to help support the needs of at-risk students, P9 also discussed lacking support over a span of years and experience teaching in different schools. P9 stated that “I've worked at maybe six or seven different schools, I would say, like across the board…that I didn't feel like there was someone” that I could go to for additional support when in need of help to support at-risk students in mathematics. P9 also believed that the administration sets the tone within the school for how supported mathematics teachers will be depending upon what the administration’s goal is for that school year. P9 stated “it just depends on your building and your principal's current goals, so if the goals are writing based, if that's where their main focus is, that's what your PLs [professional learning] is going to be on.” P9 discussed lacking support as a hinderance because when the teacher is not able to “keep up with [learning the latest in professional development] then the teacher is “doing…what you've always done with math, and you're not getting any new advice.” P9 also discussed lacking quality feedback from administration on how teachers can better support the needs of at-risk students as a stressor. P9 stated that when “I feel like sometimes admin comes in and watches the lesson, and the feedback is that was great [but] I'm like... alright, what specifically was good about it? What was effective? What can I do better?” Additionally, P9 stated that administration providing too much feedback at once can be “so overwhelming” because there are all these "things you need to fix…which can be a lot [at one time which makes it] hard to implement." Therefore, there needs to be a balance of administrative feedback to help teachers understand what they need to improve on to better support students within their classroom.

In summary, Theme 3 focused on what participants outlined as struggles to help support at-risk students in mathematics. There are three themes for RQ1. Theme 1 is that Elementary teachers must use a range of varied instructional approaches and strategies to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. Theme 2 is that Elementary teachers described needing to understand the student's needs and the value of parent involvement to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. Theme 3 is that Elementary teachers described a lack of resources, limited instructional time, PD, lacking teacher preparation, a lack of funding, lesson planning workload, and administrative support as struggles they face when trying to help support the mathematics needs of at-risk students Grade 3 through Grade 5. All three themes are characterized by descriptions of participants' struggles with instructing at-risk students in Grade 3 through Grade 5 mathematics.

RQ2 was "What are Elementary teachers' recommendations to support the mathematics achievement of at-risk students' Grade 3 through Grade 5?" There is one theme, Theme 4 for RQ2. Theme 4 focuses on participants' recommendations regarding supports to meet the needs of at-risk students in Grade 3 through Grade 5 mathematics. Theme 4 is that Elementary teachers recommend resources including additional time and personnel, changes to the curriculum, and PD to support the mathematics achievement of at-risk students Grade 3 through Grade 5.

Theme 4

Theme 4 is that Elementary teachers recommend resources including additional time, and personnel, changes to the curriculum, and PD to support the mathematics achievement of at-risk students Grade 3 through Grade 5. In this study, participants recommended providing more time to teachers to support the mathematics achievement of at-risk students' Grade 3 through Grade 5. Eight out of 10 participants recommended teachers should have more time to work with students within the classroom setting on mathematics skills. P5 stated that the "things I particularly needed in my classroom is time." Likewise, P8 also recommended "increasing [at-risk student's] math time". P2 asserted that bringing in extra time will help to "make sure [the students are] understanding what's going on". P3 stated that "if a child is at-risk, then we need more time than they have in their grade level." Therefore, P3 asserted teachers "need more instructional time during the day to teach math." P3 further explains what additional time with at-risk students might look like by providing the example: "in my grade level, I normally get an hour of math, [but] an at-risk student obviously [has] gaps, so I need that hour plus more, in addition, so I can close those gaps and move forward." P7 also provided a recommendation of increasing math class time sessions for "those below level students, they could use twice the time that we have every day." In addition to recommending more time, participants in this study also recommended increasing personnel to support the mathematics achievement of at-risk students' Grade 3 through Grade 5.

In this study, participants P7 and P9 both recommended adding more personnel as a resource to support the mathematics achievement of at-risk students Grade 3 through Grade 5. P7 stated that "if I could ask for anything, it would be another person in the room with me to help the kids." P9 recommended using existing teachers, who may not teach a homeroom class, to help pull students and provide them with additional mathematics time to work on deficits. P9 suggested that, if possible, teachers who do not have a homeroom class could "on a daily basis…for half an hour, work with fifth grade or kind of divide the students up based on needs" to provide students with additional mathematics instruction. P9 did acknowledge that this process might pose "scheduling difficulties" and that "logistically that is very challenging" but that it "could help" if admin would consider when "they're making the schedules at the beginning of the year, that they would also think about how to maximize those of us that don't have homerooms and can be used as a support." In addition to increasing personnel, participants in this study asserted that curriculum changes would also help teachers better support at-risk students Grade 3 through Grade 5 in mathematics.

In this study, six out of 10 participants recommended changes to the curriculum to support the mathematics achievement of at-risk students' Grade 3 through Grade 5. P4 stated that some at-risk students are still being "taught the General Education curriculum [which is on] grade level curriculum" but "those lessons are going over my students heads" due to their deficits. P6 stated that the current curriculum does not adequately provide instruction or resources to use with at-risk students and the teachers must find supplement material "because so many of our students are at-risk in math". As a result, we do [an intervention curriculum] called *Do the Math* and use other "resources that we've had to pull together to help [at-risk] students with their math instruction." P3 also recommended making changes to the curriculum to be more inclusive of at-risk students' needs and have more resources teachers can use with at-risk students to support the mathematics needs of at-risk students. P3 provided an example of how the curriculum lacks additional resources to support at-risk students, stating:

> I'm teaching fifth grade right now, and I'm doing fractions, but if I am an at-risk student and I still need some support with multiplication, [there should be] a couple of problems that are multiplication related for my work, because I never mastered that piece.

P3 also recommended that the math curriculum should be "supplemented with Tier 2 instruction [and integrating in] curriculum resources, like *Do the Math* and *First In Math*" to better support the needs of at-risk students. P8 recommended incorporating a math program that "can really meet those [at-risk] kids that are having a difficult time understand the foundations of math" because some teachers struggle with finding math strategies to helps support the needs of at-risk students. While making adjustments to the curriculum to be more inclusive of at-risk students would better help teachers support at-risk students, participants also discussed the need for PD to support the mathematics achievement of at-risk students' Grade 3 through Grade 5.

All 10 participants in this study discussed PD as a recommendation to support the mathematics achievement of at-risk students' Grade 3 through Grade 5. P5 recommended

> all teachers, regardless of if they are new to teaching or new to teaching the subject of math, should attend professional development so that they can know what activities, and type of learning experiences the student needs to complete in order to master this standard.

Additionally, P4 recommended more one-on-one support for math teachers who are struggling with teaching math concepts. P4 stated that "I see teachers are required or are recommended to go to math training, but [they are not really offered] one on one support" to assist with things they might be struggling to teach. All 10 of the participants in this study recommended PD to support the mathematics achievement of at-risk students' Grade 3 through Grade 5. The discussions on PD fell into three main facets: availability/timing, collaborative support, and professional development on specific topics.

Availability of Professional Development to Teachers

P6 recommended that districts provide more availability of PD at various times during the school year instead of just during summer months. P6 stated that having some PD sessions on important content such as new curriculum for the school year should be offered during the school year instead of just during the summer months, as some teachers felt that "your summer is your summer" and may not attend the sessions. Additionally, P6 recommends offering the same professional development session multiple times. P6 explained that some teachers teach "multi subjects [and] may not have been able to get to [just that] one professional development session offered as they had to attend a different session for another subject.” P6 also recommended that districts provide more opportunities for teachers to attend professional development outside of the district. P6 stated that when teachers attend out of the district conferences such as a state or national conference, it allows the teachers to “see what mathematics instruction looks like” in other classrooms. Lastly, P6 recommended that districts provide more availability for teachers to be able to visit model classrooms within the school, or school district. P6 stated that if you have a “STEM school, maybe a teacher wants to go and see how they're incorporating all of that with the mathematics to help their kids be successful.”

Collaborative Support

Nine out of 10 participants recommended that districts provide on-site collaborative support such as collaborative planning, instructional or academic coaches, or teacher mentors. Participants in this study also discussed seeking out and working collaboratively with other teachers within the same subject matter to help teachers support the instructional achievement of at-risk students Grade 3 through Grade 5. P1 recommended that teachers who are struggling to support at-risk students in mathematics Grade 3 through Grade 5 should “definitely reach out to their grade level colleagues” as a resource. P1 states that “I really find it to be more beneficial when you're actually meeting with people that are in your school and [who] knows your kids”. Additionally, P1 discussed “working collaboratively with teachers that are in the classroom day in and day out with students that are at-risk” was beneficial to helping teachers support the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics. P2 discussed, when faced with a hard time with teaching mathematics, having other teachers who "[I can be] able to ask around for help" has been great. P2 also stated that having collaboration between teachers is also helpful because:

> I feel more comfortable because I just have so much support from those around me, and anytime that I'm feeling like there is a struggle with math, [the other teachers] have a solution, or if they don't have a solution, we find one together.

P3 recommended meeting regularly with teachers on and above the grade level you are teaching within the same subject to help with vertical alignment. P3 stated that vertical alignment helps [teachers] see how [mathematics concepts] "build upon each other from each grade level." P10 also discussed working "collaboratively with my fellow math teachers" to "develop lesson plans". P10 believed that professional development "should also [take] place with your team [where you can learn] with and from your colleagues.

In addition to collaborative meetings with the same subject teachers, participants in this study recommended instructional or academic coaches and teacher mentors. P4 recommended struggling teachers should "seek out a coach" within their building that can provide them with "gains and knacks for being able to work with at-risk" [students]. P6 concurred that "relying on [an] instructional coach will help [struggling teachers] be successful." P9 also recommended having an instructional coach or mentor in the building who is an expert in the subject of mathematics so they can "model for us, what [the math concepts] looks like." P10 discussed instructional or academic coaching as a means of professional development that helps teachers support the instructional achievement of at-risk students Grade 3 through Grade 5 in mathematics. While P10 recommends instructional coaching, P10 suggests that instructional coaching should not be “based on just the performance of the teacher” or a “tiered approach” as not “every teacher needs an instructional coach”. P10 stated that instructional coaching should not just be based on the level of a teacher’s experiences as even veteran teachers could use an instructional coach to help sharpen their skills. Additionally, P10 stated that teachers should not look at instructional coaching as an evaluation but rather teachers should be “open to having an academic coach that has come in to support them.”

Professional Development on Specific Topics

Participants P3, P6, and P9 all recommended that PD should cover specific content. P9 stated that “I feel that we have professional development that is often [focused on data and not] focused on interventions. Additionally, P9 stated that professional development is lacking “differentiated resources” and recommends professional development to incorporate “specific kind of guidebooks on if your students are struggling with this [skill, then] do this.” P3 recommends that teacher preparation programs should teach strategies teachers need to support at-risk students when they are struggling with a math concept. P3 stated that teacher preparation programs tend to “teach [teachers] multiplication [and] have them do some problems [focusing] on word problems, [and then for another] day, [the program] focus[es] on estimation” but the program does not really focus on strategies of how teachers can teach these math skills to at-risk students. P6 stated that when they were provided with a new curriculum to use with at-risk students, the professional development was “very short” and felt “very rushed" and lacked "fidelity" in explaining the program so that teachers could implement it effectively. As such, P6 recommended that professional developments should have "follow up opportunities", where teachers can "speak with a specialist or someone at the curriculum level to help them" with implementing the content provided in their professional development "with their instruction." P6 stated that it can be "frustrating" for teachers after a professional development "when you're trying to learn something and teach it with fidelity [and] you're being told you have to teach it with fidelity, but you don't have the full support to get what you need." Additionally, P6 recommends that there should be professional developments created that will focus on allowing teachers time to "meet with someone to help them" on topics of their choice. P9 recommended having ongoing professional development that focuses on math weekly or monthly. P9 stated that after a professional development, you are expected to try and implement these strategies, but the strategies learned in professional development were not revisited or there was no additional professional development on math for the whole year. In this section I discussed the four themes that emerged from the study data.

In this section, I provided the results of the study. The findings of this study produced a total of four themes which were: (a) Theme 1 was that Elementary teachers must use a range of varied instructional approaches and strategies to support the mathematics achievement of at-risk Grade 3 through Grade 5 students, (b) Theme 2 was that Elementary teachers described needing to understand the student's needs and the value of parent involvement to support the mathematics achievement of at-risk Grade 3 through Grade 5 students, (c) Theme 3 was that Elementary teachers described a lack of resources, limited instructional time, PD, lacking teacher preparation, a lack of funding, lesson planning workload, and lack of administrative support as struggles they face when trying to help support the mathematical needs of at-risk students Grade 3 through Grade 5, and (d) Theme 4 was that Elementary teachers recommend resources including additional time, additional personnel, changes to the curriculum, and PD to support the mathematics achievement of at-risk students Grade 3 through Grade 5. These themes were used to answer the RQs of this study. In the next section I will discuss how I was able to achieve trustworthiness within the study.

Evidence of Trustworthiness

Trustworthiness within this study occurred through credibility, transferability, dependability, and confirmability. The credibility strategies that were used in this study were member checking, saturation, reflective bracketing, and triangulation (see Bengtsson, 2016; Korstjens & Moser, 2018; Yin, 2018). First, to ensure credibility within this study I conducted member checking by sending the participants a draft of the study findings (see Bengtsson, 2016). To ensure accuracy and validity, during member checking, each participant was offered the opportunity to read the findings to ensure their information was accurate. No feedback was offered by participants in this study. The second way I ensured credibility within this study was through reaching saturation (Saunders et al., 2018). During the data analysis stage of my study, I reviewed the transcripts, my field journal, reflective notes, and analytical memos from the 10 participants' interviews. Once the interview responses began repeating and offered no new information, I knew I had reached saturation (see Saldana, 2016; Saunders et al., 2018). The third way I ensured credibility within this study was through reflective bracketing during the interview process and field journaling (see Yin, 2016). I used reflective and field journal during the interviews and data analysis process to record my feelings and experiences related to the study. This helped me to avoid any biases and to remain objective when I conducted my data analysis (see Yin, 2016). The fourth way I ensured credibility within this study is through triangulation of data during the data analysis process (see Yin, 2016). To triangulate the data, I used two data analysis coding approaches, a Priori and open descriptive coding. I used the information collected through interview responses, reflective bracketing notes, field journaling and the data analysis process (see Yin, 2016). Participants were allowed to bring lesson plans to reference during the interview process; however, no participant used this option.

In this study I achieved transferability by using the same approved interview protocol, interview questions and interview probes, for each participant during the interview process (see Bengtsson, 2016). I also achieved transferability in this study by collecting detailed, thick, rich descriptions, as detailed descriptions in which others can understand, provides opportunity for my findings to be generalized to another setting (see Korstjens & Moser, 2018; Ravitch & Carl, 2016; Schwandt, 2015). In this study I was also able to ensure dependability through my clear research design, research approach and through thoroughly explaining the data analysis. I also achieved dependability in this study ensuring consistency within the interview protocol and ensuring that the responses from the participants could answer the RQs of the study (see Bengtsson, 2016; Korstjens & Moser, 2018; Merriam & Tisdell, 2016). Additionally, I ensured dependability within this study by keeping an audit trail of all the communication I had with participants. Lastly, I ensured confirmability within this study by ensuring I captured each participant responses accurately (see Bengtsson, 2016; Yin, 2018). I listened to audio recordings multiple times to ensure I accurately transcribed participant's words (see Bengtsson, 2016; Yin, 2018). I also used member checking to ensure I captured the correct representation of the participants' words (see Bengtsson, 2016; Yin, 2018).

I used reflective bracketing and notes in a field journal to ensure I removed biases when conducting interviews, transcribing interviews, and during the data analysis process (see Ahern, 1999; Saldana, 2016; Wall et al., 2004). I wrote down my biases, perspectives, and perceptions of the phenomenon prior to conducting interviews in a researcher's journal. I used a field journal to record observations during the interviews and included this data within the triangulation process to identify themes and codes. In the next section, I will provide a summary of Chapter four.

Summary

In Chapter 4 I described the setting, demographics, data collection, data analysis, results of the findings, and evidence of trustworthiness. In this study I conducted semistructured interviews with 10 participants. I used a Priori coding grounded in the conceptual framework of Bruner's theory on the stages of representation and two rounds of descriptive open coding to interpret the information obtained in the interviews to answer the RQs. In Chapter 4, I discussed the four themes that derived from the data during the data analysis process.

The key findings from Chapter 4 revealed that Bruner's theory on the stages of representation were not sequentially and fully implemented using instructional supports, and various mathematics approaches. Additionally, participants' recommendations did not reflect use of the iconic stage of Bruner's three stages of representation theory. Moving students too quickly to abstract thinking without fully engaging all the steps in Bruner's theory on the stages of representation can result in negative behaviors and learned helplessness in students (see Peltier & Vannest, 2018). The stages of Bruner's theory as described by participants in this study consistently included using instructional supports, approaches, and recommendations that are considered stage one enactive, and stage three symbolic. All participants in this study described using primarily enactive, and symbolic supports to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. However, inconsistent with the conceptual framework of Bruner's theory on the stages of representation, the second stage, iconic, was missing from several participant's responses of the instructional supports, approaches, and recommendations to support instructional achievement of at-risk students Grade 3 through Grade 5 in mathematics. Gradually progressing students through all three stages of Bruner's theory on the stages of representation helps to build a strong mathematical foundation (see Peltier & Vannest, 2018).

In Chapter 5, I restate the purpose of this basic qualitative study and discuss the interpretation of the findings in relation to the conceptual framework and the literature. I also include the limitations of this study and recommendations for future research. Lastly, in Chapter 5 I describe the implications for positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this basic qualitative study was to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. A basic qualitative approach was appropriate because it provided the opportunity to understand and interpret the participants' experiences related to supporting at-risk students Grade 3 through Grade 5 in mathematics (see Merriam & Tisdell, 2015). In the study state, a gap in practice was identified in the mathematics state performance between Grade 3 through Grade 5 students who are not at-risk and those who are at-risk as defined in the terms section of Chapter 1 (see Southern State Mathematics Test, 2016–2022). Moving beyond the gap in practice, I also identified a gap in the literature as there was limited literature on the perspectives of teachers regarding supporting the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics. In addition, I explored the gap in practice regarding the perspectives from Grade 3 through Grade 5 mathematics teachers regarding the specific instructional supports, approaches, and recommendations needing to be identified to support this population of students' needs to strengthen their mathematics achievement. Filling this gap in practice may identify and strengthen the support for teachers struggling to meet the instructional needs of this student population. As such, for this study I interviewed 10 Elementary teachers with experience teaching at-risk students Grade 3 through Grade 5 in mathematics. The intention for this study was that the instructional experiences of these 10 participants might provide information that could create a toolbox for other teachers to provide support to other at-risk students Grade 3 through Grade 5 in mathematics.

Interpretation of the Findings

I conducted this basic qualitative study to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students and their recommendations for changes (if any) in these areas. The problem and phenomenon that were the focus of this research study was that teachers are struggling to support the instructional needs of at-risk students Grade 3 through Grade 5 in mathematics in a Southern state. Upon conducting a literature review in Chapter 2, I found a gap in literature specifically within the areas of: (a) exploring the phenomenon from a teacher's perspective, (b) exploring recommendations for the phenomenon from a teacher's perspective, and (c) exploring the phenomenon focusing on the demographics of at-risk students. In the literature I reviewed and discussed: low performance in mathematics for at-risk students in the nation, factors that influenced student's mathematics achievement, characteristics of at-risk students, and strategies that could help support teachers to teach mathematics. Literature was limited on this phenomenon from a teacher's perspective. As such, the findings of this study will extend the knowledge in the discipline of education, especially regarding the perspectives of teachers providing lived experiences on how teachers report their struggles related to how they support the instructional achievement of at-risk students Grade 3 through Grade 5 in mathematics.

Findings Related to the Literature

The findings from Theme 1, Theme 2, and Theme 3 were used to answer RQ1 and were consistent with the literature regarding Elementary teachers' perspectives of instructional supports and approaches, to support the mathematics achievement of at-risk students Grade 3 through Grade 5. The findings from Theme 1, Theme 2, and Theme 3 indicated that participants believed having a range of varied instructional supports and approaches is imperative to support the needs of at-risk students Grade 3 through Grade 5 in mathematics. As corroborated by Peltier and Vannest (2018), it is important for teachers to maintain their academic freedom in choosing the types of instructional approaches and instructional strategies they use within the classroom. The majority of participants discussed the following as instructional supports and approaches they used to support the mathematics needs of at-risk students in Theme 1, Theme 2, and Theme 3 and that also align with the literature are: CRA, interventions, peer tutoring, direct instruction, differentiation, project-based learning, real life connections, scaffolding, vocabulary, mnemonics, Blooms Taxonomy, parental involvement, knowledge of students, curriculum, and PD/teacher preparation.

In the study, participants described their experience using the CRA instructional approach with at-risk students Grade 3 through Grade 5 to help support their mathematical needs. According to Peltier and Vannest (2018) CRA is an instructional framework that is grounded in Bruner’s theory of the stages of representation. CRA is a proven, successful framework that supports students in mathematics through bridging levels of understanding within an instructional lesson (Peltier & Vannest, 2018). CRA, based on Bruner’s theory on the stages of representation, includes three stages: concrete, representational, and abstract. Teachers should move students through each stage of CRA sequentially to effectively help students master mathematics concepts (Peltier & Vannest, 2018). All 10 participants described using some or all components of the CRA method to move students through learning mathematics concepts. While the literature included the importance of moving students through all three CRA stages, the findings from participants mostly focused on two of the stages that included the use of strategies and approaches aligning to the concrete and abstract stages. Based on the literature, the lack of sequentially moving students through all three stages can render the overarching instruction ineffective (see Bouck & Park, 2018; see Peltier & Vannest, 2018).

The use of interventions was discussed in the findings of the study as well as in the literature. While participants in this study did not specifically call their supports and approaches interventions, the characteristics of their experiences describe interventions based on the literature. Interventions are additional programs outside of regular classroom instruction that provide support to students with mathematical difficulties (Kalogeropoulos et al., 2019). Nelson and Powell (2018) asserted that interventions can improve the math outcomes of students who are experiencing math difficulties. Additionally, Lein et al. (2020) believed that it was of the most importance for school districts to identify mathematic intervention programs for students struggling in mathematics. Eight out of 10 participants described using instructional grouping such as: one-on-one, small group, Tier 2/EIP services to help support the needs of at-risk students in mathematics. Kalogeropoulos et al. (2019) described Tier 2 instruction as targeted instruction provided by the classroom teacher to students who did not make adequate progress on a skill. Kalogeropoulos et al. (2019) discussed interventions as small groups of students around three to five students as well as one-to-one grouping. Kalogeropoulos et al. (2019) asserted that small groups and one-to-one intervention groups are both more effective in helping to support struggling students than interventions with larger groups. Nelson and Powell (2018) believed that targeted math interventions can benefit at-risk students, and help to address math deficits; therefore, improving math outcomes. In the findings from the study, seven out of 10 participants also discussed peer tutoring and eight out of 10 participants discussed direct instruction as an instructional approach they used with at-risk students when teaching mathematics. Boon et al. (2019) discussed peer tutoring and direct instruction as research-based interventions that can help improve the mathematical outcome of students.

According to the findings of this study, eight out of 10 participants discussed differentiation as an instructional support, although, within the literature, differentiation is discussed as an instructional approach. Tomlinson (1999) discussed differentiation as an effective method to help support student achievement through ensuring the classroom environment was conducive to learning. Participants in this study also discussed project based learning and real-life connections as instructional approaches they used to help support the needs of at-risk students in mathematics. Three out of 10 participants discussed project based learning as an effective approach to support at-risk students in mathematics. 10 out of 10 participants discussed real-life connections as an effective approach to support the mathematical needs of at-risk students. According to Shahsavani et al. (2020) project based learning and real-life connections are both strategies that can help support the mathematics needs of at-risk students. Shahsavani et al. (2020) asserted that project based learning can help students reinforce several critical skills while real-life connections is a key component to making a student's learning relevant. Similarly, Ewing et al. (2019) found that a "common thread" among new teachers was the implementation of "strategies focused on showing meaning and relevance" in their lessons when they taught students in their specific content fields (p. 4–5).

Based on the literature scaffolding, when teacher(s) provide support(s) for struggling students to aid in learning material that a student may know in part or not at all (Ertugruloglu et al., 2023), is another effective approach to helping students' understanding mathematics. Eight out of 10 participants within the study asserted that scaffolding is an effective instructional approach when helping support at-risk students in mathematics. Shahsavani et al. (2020) confirmed that scaffolding was an effective approach to teaching mathematics to students and that using scaffolding allows teachers to activate the student's working memory pertaining to pertinent mathematics skills. Participants and researchers in the literature discussed using vocabulary as another means of effective support for at-risk students in mathematics. Two out of 10 participants discussed vocabulary within the findings; as did Kalogeropoulos et al. (2019) stating that key mathematics vocabulary that students encounter within a lesson, materials and activities should be identified in advance and should be taught to students prior to starting the lesson. Mnemonics was presented in the findings as an effective instructional approach to help support the needs of at-risk students. Similarly, Boon et al. (2019)

asserted that mnemonics is a well-researched instructional approach that has been proven to help support students and improve students' mathematics performance. Additionally, Boon et al. (2019) stated that mnemonics can be effective to improve mathematics achievement with at-risk students. While four out of 10 participants discussed using Bloom's taxonomy regarding higher order thinking skills, Tobondo and Retnawati (2018) asserted that one of the foci in learning mathematics should be to improve student's higher order thinking skills.

Six out of 10 participants in this study also discussed the importance of the teacher knowing their student. Thomas-Brown et al. (2020) upheld the importance of teachers knowing the population they teach. According to Peltier and Vannest (2018) instructional decisions should always be made with the student at the core of the educator's decision-making process. Rosli and Aliwee (2021) also believed that it is imperative that teachers shift their teaching practices from teacher centered to student centered. Additionally, Powell et al. (2020) asserted that educators should base their instructional supplement, intervention, and instruction support based on the student's difficulty level. As a part of knowing the student, five out of 10 participants conveyed the importance of parental involvement. Participants in this study believed that parental support at home is vital to the success of at-risk students. Elliott and Bachman (2018) declared that when parents help their children at home in mathematics, children are more engaged in mathematical activities within the classroom. Lastly, the findings from the study and the literature both support the need for PD as a means to help support at-risk students. Anitasaria and Retnawati (2018) discussed the need to improve teacher training through means of professional development to enhance the quality of teachers. All 10 participants discussed professional development as a need and that PD needed to focus on teacher needs derived from experiences when trying to support the needs of at-risk students in mathematics. Rosli and Aliwee (2021) also asserted that professional development is more effective when professional development is based on the needs of the teacher. Additionally, Anitasari and Retnawati (2018) asserted that educators should continually participate in professional development to improve teacher performance and student achievement.

I used the findings from Theme 4 to answer RQ2 and were consistent with the literature regarding Elementary teachers' recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5. The findings from this study concluded that all 10 participants recommended PD as an effective way to help teachers support the mathematics achievement of at-risk students Grade 3 through Grade 5. According to Rosli and Aliwee (2021) professional development is an effective way for teachers to improve their teaching technique to help foster better classroom achievement. When discussing PD, participants within this study specifically recommended a form of collaborative PD as an effective way to help teachers support at-risk students in mathematics. Both the findings from this study and the literature concludes that it is vital for teachers to have a collaborator to strengthen the support for teachers and to provide appropriate instructional supports to enhance the instructional achievement of at-risk students Grade 3 through Grade 5 in mathematics. Nine out of 10 participants declared that having a mentor, math coach, or other teachers to glean information from was imperative in teaching at-risk students. Similarly, to the findings of this study, Tobondo and Retnawati (2018) also asserted that collaborating with teachers within the same school, and even providence can assist in the exchange of information that can help to solve problems teachers may face when teaching mathematics to at-risk students.

Findings Related to the Conceptual Framework

Bruner's theory on the stages of representation was used as the conceptual framework and informed the study and RQs of the study. In Bruner's (1966) theory on the stages of representation, Bruner discussed the cognitive processing of how learners acquire information. Bruner (1966) believed that learning takes place by moving sequentially through three stages: enactive, iconic, and symbolic. In the first stage, enactive, Bruner (1966) asserted that learning new information starts when students manipulate items with their hands. Bruner (1966) believed that once learners demonstrate learning through manipulating items with their hands, they can then move onto the second stage, iconic. In the iconic stage, Bruner (1966) asserted that learners continue acquiring knowledge of the concept through creating drawings based on the information they acquired in the enactive stage. Bruner (1966) then contended that learners demonstrate mastery of the skill in the symbolic stage, which is the final stage. Bruner (1966) believed that in the symbolic stage, a learner can use equations or math symbols to express their understanding of the concept. Bruner (1966) also believed that learners should experience acquiring new information by moving sequentially through all three stages rather than through each stage independently. To ensure students have a solid understanding of mathematics concepts, teachers should move students sequentially through Bruner's theory on the stages of representation.

In this study, participants provided their experiences in helping support at-risk students in Grade 3 through Grade 5 in mathematics. The key finding that emerged from the themes related to the conceptual framework is that while participants incorporated Bruner's theory on the stages of representation in their efforts to support the instructional achievement of at-risk students in Grade 3 through Grade 5 in mathematics, there was limited information provided on the implementation of the iconic stage of Bruner's theory on the stages of representation.

In Theme 1, I found that using a range of varied instructional supports and approaches was key for teachers to support the mathematics achievement of at-risk students Grade 3 through Grade 5. All participants in this study described the instructional supports and approaches they found to be most effective with teaching at-risk students' mathematics. While having various instructional supports and approaches was found to be imperative to helping support at-risk students (see Peltier & Vannest, 2018), I found that most of the instructional supports and approaches that the participants described implementing within their classroom reflected enactive supports or symbolic components. The enactive supports that participants discussed were manipulatives. In alignment with Bruner (1966) theory on the stages of representation, manipulatives provide the learner with the opportunity to explore the concept based on action. The symbolic components participants discussed were solving equations and word problems. The symbolic stage in Bruner's theory on the stages of representation deals with learners being able to explore the concept using language or math symbols. Additionally, in the symbolic stage, learners should be able to think abstractly about mathematical concepts. The iconic stage of Bruner’s theory on the stages of representation was widely missing from the findings in this study. The iconic stage of Bruner’s theory of representation connects the concrete to the abstract (Bruner, 1966). In the iconic stage, learners are able to bridge their understanding of the concepts using manipulatives, while representing their understanding using drawings, and writing about their understanding of the concept using mathematical symbols (Bruner, 1966). When the iconic stage is missing from the process, it will more than likely lead to poor mathematical outcomes for students (Peltier & Vannest, 2018).

In Theme 2 I found that teachers must know the needs of at-risk students and involve parents to adequately support at-risk students’ mathematical deficits. Similarly, to Theme 1, most of Bruner’s theory on the stages of representation discussed in Theme 2 were primarily the enactive and symbolic stages. When discussing parental involvement, the participants explained how parent involvement is related to both the enactive and symbolic stages of Bruner’s theory on the stages of representation. Parents who do not understand the mathematics skill needs of their students, or potential enactive supports are limited in helping their child(ren) better understand mathematics content to develop the critical skills they need to demonstrate math fluency. According to Elliott and Bachman (2018), students’ mathematics abilities are negatively affected when their parents have low engagement or enjoyment of mathematics. Participants discussed the need for parents to be taught what students are learning in mathematics as sometimes parents learned mathematics in an abstract manner instead of being taught mathematics by progressing sequentially through the three stages from enactive, to iconic, to symbolic. As a result of not knowing the mathematics concepts being taught in class, parents can sometimes teach their children to start with the equation or symbolic stage, instead of walking them through the three stages sequentially as the teacher may have instructed in the classroom lesson. Teaching parents' mathematics concepts can increase the frequency of math activities introduced at home, and thus benefit the students' mathematics skill development as well (Elliott & Bachman, 2018).

In Theme 3, I found that teachers struggled with enactive and symbolic components of Bruner's theory on the stages of representation when trying to support the achievement of at-risk students Grade 3 through Grade 5. Theme 3 related to the enactive stage of Bruner's theory on the stages of representation as participants discussed how students need access to more resources such as manipulatives to help solidify students' understanding of mathematics concepts. Manipulatives are common tools used in classrooms and they are critical to use when teaching mathematics to at-risk students (Bouck & Park, 2018). In addition to the enactive stage, Theme 3 also relates to Bruner's theory on the stages of representation regarding teachers struggling with having enough instructional time. Lacking instructional time limits a teacher's ability to adequately progress students through Bruner's theory on the stages of representation while exploring mathematical concepts. For Bruner's theory on the stages of representation to be used effectively, teachers must be able to move students sequentially through each stage of representation while exploring each mathematical concept (see Bouck & Park, 2018;

Peltier & Vannest, 2018). In addition to being able to progress students sequentially through Bruner's theory on the stages of representation, the responses of participants in Theme 3 revealed that teachers are not being moved sequentially through the three stages of representation when acquiring new information within teacher preparation programs and professional development (see Anitasari & Retnawati, 2018). The lack of fidelity in moving teachers sequentially through Bruner's stages of representation when teaching mathematical concepts will result in teachers not being able to master the necessary competencies to teach students (see Anitasari & Retnawati, 2018). Additionally, this can result in teachers being unprepared to teach mathematics to at-risk students in Grade 3 through Grade 5.

Theme 4 related to the conceptual framework of Bruner's theory on the stages of representation primarily with the enactive stage. One of the recommendations participants discussed was the need for more resources such as manipulatives. The use of manipulatives is an enactive support, as in the enactive stage, learners acquire new information through action (Bruner, 1966). Manipulatives provide students with the ability to have concrete objects they can use to understand the mathematical concept (see Bouck & Park, 2018). In the enactive stage, learners use manipulatives to visualize mathematical concepts and move objects to help them solve math problems. Manipulatives are a support that is consistently used to support students in mathematics (see Bouck & Park, 2018). Participants in this study recommended that more manipulatives should be used for students to help strengthen students' learning in the enactive stage.

The themes that emerged within this study revealed that while participants in this study incorporated several practices from the literature and the conceptual framework of Bruner's theory on the stages of representation within their teaching experiences, the enactive and symbolic stages of Bruner's theory on the stages of representation were the stages primarily used to help support the mathematics achievement of at-risk Grade 3 through Grade 5 students. While the findings from Theme 1, Theme 2, Theme 3 and Theme 4 primarily focused on Bruner's enactive and symbolic stages of representation, I did find that the iconic stage was either rarely mentioned or not mentioned at all in participant responses. The iconic stage is the second stage of Bruner's theory on the stages of representation. In the iconic stage, Bruner (1966) asserted that learning should take place through drawings and visual representation of the concept. The iconic stage should build upon the enactive stage where learning is now moving beyond students manipulating items with their hands to learn concepts, and students are now able to create drawings to assist in understanding the concept. When the iconic stage was mentioned in the responses of the participants in this study, it was discussed as an important part of the learning process that should be sequentially implemented after the enactive stage and before the symbolic stage to have a solidified understanding of the mathematical concept for at-risk students.

Limitations of the Study

A limitation with this study was the sample size of 10 interviews. While 10 interviews were adequate to reach saturation within this study, 10 interviews are still a small sample size compared to the population of teachers who have experience teaching mathematics to at-risk students Grade 3 through Grade 5 in the Southern state. I was able to overcome this limitation by ensuring my study reached saturation. I used semistructured interview questions to gain detailed information from participants on their perspectives of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. From these interviews I was able to obtain rich, thick descriptions which contributed to me being able to reach saturation (see Yin, 2016). Based on Saunders et al. (2018), saturation is achieved when no new data arises from the data collection or analysis. I knew I had reached saturation within the interviews when the responses from participants were similar and no new information from participants arose.

An additional limitation encountered in this study was my personal experiences with teaching mathematics to at-risk students. I overcame these limitations by using reflective bracketing and a field journal. As an educator, I have experience working with at-risk students in the capacity of classroom teacher and intervention teacher. According to Ahern (1999), reflective bracketing is a strategy that researchers use to ensure accurate description of interviews and to avoid researcher bias. Ahern (1999) also stated that reflective bracketing helps the researcher focus on understanding what the interviewee is saying instead of trying to alter those responses. Due to my experience with at-risk students, prior to conducting interviews I partook in reflective bracketing. Prior to conducting interviews, I recorded my own "preconceived notions [and] experiences related to the phenomenon" (Ahern, 1999). This allowed me to reflect, process, and understand what my experiences were so that I could focus on understanding what the interviewees experiences were (Ahern, 1999). During the interview process I used both reflective bracketing and field journals to eliminate researcher bias. According to Phillippi and Lauderdale (2018) field journaling is a process that can help eliminate research bias. In field journals, researchers can keep track of vital information during the interview process (Phillippi & Lauderdale, 2018). I used a field journal to write down pertinent information that the participant said which I wanted to highlight later in the coding process. I also used a field journal to write down questions, observations, and contextual information (see Phillippi & Lauderdale, 2018) from participants. During the interview process, I also used reflective bracketing to refer to my own preconceived notions to assure I did not make assumptions, or “eliminate or alter” the experience of participants (Ahern, 1999). Additionally, as I conducted data analysis, I continued the process of reflective bracketing by referring to my perceived notions and experiences to bring a heightened awareness of my thoughts to ensure it did not influence my perception of the data (Ahern, 1999). Lastly, I also used my field journal notes to interpret and help identify patterns and themes within the data.

Recommendations

The purpose of this basic qualitative study is to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. There are limited studies on the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk students Grade 3 through Grade 5 and their recommendations for changes in these areas. As such, this study will contribute to the literature concerning supporting at-risk students in mathematics. Based on the findings from this study, I recommend further research to explore larger populations of at-risk students using a mixed method quantitative study to explore how teachers' perspectives equate to quantitively achievements or lack of achievement in mathematic scores of at-risk students. While this basic qualitative study provided lived experiences from teachers on the phenomenon, a mixed method study will allow for teachers to provide their perspectives and then test those perspectives quantitively to measure effective based on student data. I also recommend educators to use Bruner's three stages of representation theory with fidelity.

Based on the lack of responses detailing implementing instructional supports and instructional approaches using the iconic stage of Bruner's theory on the stages of representation, it is apparent that fidelity in implementing this theory sequentially is lacking. Thus, my recommendation is, therefore, to ensure teachers incorporate all three stages of Bruner's theory on the stages of representation with fidelity (see Bouck & Park, 2018; Peltier & Vannest, 2018). Another recommendation based on the findings of this study is for teacher preparation programs to incorporate current teachers within their courses. Findings from this study showed that teachers shared the perspective that collaborative planning and teacher mentors were highly desired to help support struggling teachers. By incorporating current teachers into teaching preparation programs, this will allow new teachers, and teachers who are attending courses for continuing education, to receive current, applicable information from within the education field (see Anitasari & Retnawati, 2018; Appova, 2018).

A recommendation is for schools to incorporate vertical planning in a collaborative setting. Participants in this study who detailed vertical planning within their responses asserted that vertically planning with teachers who are teaching above and below grade levels helped them to better understand how to teach the concept they had to teach for their current grade level. Including vertical planning within a collaborative setting can help each grade level teacher to better understand how the mathematical concepts they teach in their grade level is going to prepare students for the next grade level, as mathematics is a subject that builds upon previous concepts taught (see Anitasari & Retnawati, 2018; see Thomas-Browne et al., 2020). Another recommendation based on the findings of this study is for school districts to provide PD based on the input of educators. All the participants in this study discussed PD as a need they had and made recommendations on how professional development could better support teachers of at-risk students in mathematics. By refining PD based on teacher input, school districts would be able to directly address the needs of teachers and therefore, affect the mathematical achievement of at-risk students (see Rosli & Aliwee, 2021). The last recommendation based on the findings of this study is for school districts to invest in supplemental curricula, that is evidence based, to be effective to help at-risk students in mathematics. Several participants in this study discussed having to find additional resources outside of the district curriculum to use with at-risk students. By districts providing evidence based supplemental curriculum for at-risks students, they will be helping to better equip teachers to support the mathematical needs of at-risk students (see Lein et al., 2020).

Implications

The purpose of this basic qualitative study was to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. This study helps address the gap in literature on the phenomenon of at-risk students struggling in mathematics from a teacher's perspective. The participants in this study provided details of their teaching experiences that provide a consensus of. instructional approaches, supports and recommendations in which can be used to help support at-risk students Grade 3 through Grade 5 in mathematics.

Positive Social Change

Implications for social change on an individual, organization, and societal level would be an increase of student achievement in mathematics. Nelson et al. (2019) affirmed that students performing well in mathematics can lead to positive social change, economic growth, and reduced crime rate. This study afforded participants to provide their experiences on how to support at-risk students in Grade 3 through Grade 5 in mathematics. Additionally, participants in this study also provided recommendations of how to support at-risk students in Grade 3 through Grade 5. These recommendations and findings from the study could lead to strengthened teaching practices within the field of mathematics which can lead to growth, thereby strengthening instruction and facilitating students' achievement. As such, the recommendation for practice is to continue research on exploring teacher perspectives on how to support at-risk students in mathematics.

Theoretical Implications

Bruner's stage of representation is one of many cognitive developmental learning theories. Bruner's stages of representation focus on sequentially moving the learner from concrete to abstract thinking (Bruner, 1966). Bruner's theory of representation has been expanded to form the CRA mathematics framework (Peltier & Vannest, 2018). Both Bruner's theory on the stages of representation and the CRA framework require that learners progress through each stage to gain a solid fundamental understanding of the mathematical concept. The theoretical implications of this study would be to continue expanding this theory through seeking to understand the ramifications of skipping stages or implementing stages out of order has on the leaner's ability to grasp a mathematical concept.

Conclusion

The purpose of this basic qualitative study was to explore the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. The participants in this study provided valuable insight into how they support at-risk students and recommendations that can help teachers support the mathematical needs of at-risk students. From the participant experiences, it was concluded that one stage of Bruner's stages of representation (1966) was consistently missing, the iconic stage. When teaching mathematics to at-risk students, it is imperative that teachers implement all three stages enactive/concrete, iconic/representational, and symbolic/abstract with fidelity in order for students to build a solid understanding of the mathematical concept (see Peltier & Vannest, 2018). While some participants discussed their experience in teaching mathematics to at-risks students by moving through each stage sequentially, overall, the findings showed that the iconic stage was widely missing from the experiences provided by participants in this study. According to Peltier and Vannest (2018), implementing all three stages of Bruner's stages of representation theory (and the CRA framework) with fidelity will likely render improved achievement for students. As such, a recommendation would be to ensure teachers are teaching mathematics concepts, skills, and activities using Bruner's stages of representation and to ensure teachers are progressing students sequentially through each stage with all mathematical concept taught.

It is imperative that teachers have a range and variety of instructional supports, approaches, and interventions they can use to support the needs of at-risk students (see Peltier & Vannest, 2018). As such, the findings from this basic qualitative study may provide educators with an arsenal of instructional supports and approaches that can be used to help support the mathematical needs of at-risk students in Grade 3 through Grade 5. Rosli and Aliwee (2021) asserted that professional development programs should be designed based on the needs of teachers to ensure the professional development is effective.

Findings from this study indicated that participants desired to have PD based on topics they needed further assistance with implementing in their classrooms. As such, findings from this study may also contribute to school districts being able to prepare PD focused on what teachers relay they need assistance with, to help teachers support the mathematical needs of at-risk students in Grade 3 through Grade 5. Participants in this study also discussed novice teachers lacking the skills needed to teach at-risk students' mathematics. Sharp et al. (2019) asserted that educator's knowledge, skill, and methods can greatly influence student learning. Findings from this study can help improve teacher preparation programs to help better prepare teachers to support the mathematics needs of at-risk students in Grade 3 through Grade 5.

In conclusion, it is of up most importance that teachers are provided with adequate resources to support the mathematical needs of at-risk students. This study was conducted with the intentions of exploring the perspectives of Grade 3 through Grade 5 teachers of the instructional supports, approaches, and recommendations to support the mathematics achievement of at-risk Grade 3 through Grade 5 students. The results from this study can provide teachers with instructional resources they can use to help increase the mathematics achievement of at-risk students which could result in positively influencing the mathematics achievement of at-risk students on a local and national level.

References

Ahern, K. (1999). Ten tips for reflective bracketing. *Qualitative Health Research*, *9*(3), 407–411. https://doi.org/10.1177/104973239900900309

Al Otaiba, S., & Petscher, Y. (2020). Identifying and serving students with learning disabilities, including dyslexia, in the context of multitiered supports and response to intervention. *Journal of Learning Disabilities*, *53*(5), 327–331. https://doi.org/10.1177/0022219420943691

Anitasari, E., & Retnawati, H. (2018). The motivation of mathematics teachers in continuing professional development. *Journal of Physics: Conference Series*, *1097*, 1–8. https://doi.org/10.1088/1742-6596/1097/1/012142

Ardi, Z., Rangka, I. B., Ifdil, I., Suranata, K., Azhar, Z., Daharnis, D., Afdal, A., & Alizamar, A. (2019). Exploring the elementary students learning difficulties risks on mathematics based on students' mathematic anxiety, mathematics self-efficacy and value beliefs using Rasch measurement. *Journal of Physics: Conference Series*, *1157*(3), 1–7. https://doi.org/10.1088/1742-6596/1157/3/032095

Barley, Z., Lauer, P. A., Arens, S. A., Apthorp, H. A., Englert, K. S., Snow, D., & Akiba, M. (2002). *Helping at-risk students meet standards: A synthesis of evidence-based classroom practices* (Report No. ED -01 -CO -000). U.S. Department of Education, Office of Educational Research and Improvement. https://eric.ed.gov/?id=ED475904

Baten, E., Vansteenkiste, M., De Muynck, G.-J., De Poortere, E., & Desoete, A. (2020). How can the blow of math difficulty on elementary school children's motivational, cognitive, and affective experiences be dampened? The critical role of autonomy-supportive instructions. *Journal of Educational Psychology*, *112*(8), 1490–1505. https://doi.org/10.1037/edu0000444

Bengtsson, M. (2016). How to plan and perform qualitative study using content analysis. *NursingPlus Open*, *2*, 8–14. https://doi.org/10.1016/j.npls.2016.01.001

Boon, R. T., Urton, K., Grünke, M., & Rux, T. A. (2019). Mnemonic strategies in mathematics instruction for students with learning disabilities: A narrative review. *Learning Disabilities: A Multidisciplinary Journal*, *24*(2), 49–62. https://doi.org/10.18666/ldmj-2019-v24-i2-9901

Bouck, E. C., & Park, J. (2018). A systematic review of the literature on mathematics manipulatives to support students with disabilities. *Education and Treatment of Children*, *41*(1), 65–106. https://doi.org/10.1353/etc.2018.0003

Bruner, J. (1966). *Toward a theory of instruction.* Cambridge.

Byrne, M. (2001). Understanding life experiences through a phenomenological approach to research. *AORN Journal*, *73*(4), 830–832.

Camañan, C. T. (2019). Employing concrete-representation-abstract approach in enhancing mathematics performance. *SLONGAN*, *4*(1), 1–88. https://rpo.cjc.edu.ph/index.php/slongan/article/view/21

Collingwood, N., & Dewey, J. (2018). “Thinking your problems away”: Can maths interventions be developed to address both the academic and affective aspects of learning in primary aged children? *Educational & Child Psychology*, *35*(2), 76–92. https://doi.org/10.53841/bpsecp.2018.35.2.76

Collins, E. (2018). Identifying the characteristics of students at-risk: A psychological approach. *International Journal of Education and Evaluation*, *4*(7), 32-39. https://www.iiardjournals.org/get/IJEE/VOL.%204%20NO.%207%202018/IDENTIFYING%20THE.pdf

Cook, S. C., Collins, L. W., Morin, L. L., & Riccomini, P. J. (2020). Schema-based instruction for mathematical word problem solving: An evidence-based review for students with learning disabilities. *Learning Disability Quarterly*, *43*(2), 75–87. https://doi.org/10.1177/0731948718823080

Creswell, J. W. (2014). *Research design: Qualitative*, quantitative*, and mixed method approaches* (4th ed.). Sage

Creswell, J. W., & Poth, C. N. (2018). *Qualitative research and inquiry design: Choosing among five traditions* (4th ed.). Sage.

Downe-Wambolt, B. (1992).Content analysis: Method, applications and issues. *Health Care for Women International*, 13(3), 313–321. https://doi.org/10.1080/07399339209516006

Elhami, A., & Khoshnevisan, B. (2022). Conducting an interview in qualitative research: The modus operandi. *Mextesol Journal, 46*(1).

Elliott, L., & Bachman, H. J. (2018). How do parents foster young children's math skills? *Child Development Perspectives*, *12*(1), 16–21. https://doi.org/10.1111/cdep.12249

Ennis, R., Lane, K., & Oakes, W. (2018). Empowering teachers with low-intensity strategies to support instruction: Within-activity choices in third-grade math with null effects. *Remedial and Special Education*, *39*(2), 77–94. https://doi.org/10.1177%2F0741932517734634

Ertugruloglu, E., Mearns, T., & Admiraal, w. (2023). Scaffolding what, why and how? A critical thematic review study of descriptions, goals, and means of language scaffolding in Bilingual education contexts. *Science Direct, 40.* https://doi.org/10.1016/j.edurev.2023.100550

Ewing, J., Gresham, G. J., & Dickey, B. (2019). Pre-service teachers learning to engage all students, including English language learners, in productive struggle. *Issues in the Undergraduate Mathematics Preparation of School Teachers*, *2*.

García-Campos, M.-D., Canabal, C., & Alba-Pastor, C. (2020). Executive functions in universal design for learning: Moving towards inclusive education. *International Journal of Inclusive Education*, *24*(6), 660–674. https://doi.org/10.1080/13603116.2018.1474955

Gilmour, A. F., Fuchs, D., & Wehby, J. H. (2019). Are students with disabilities accessing the curriculum? A meta-analysis of the reading achievement gap between students with and without disabilities. *Exceptional Children, 85*(3), 329–346. https://doi.org/10.1177/0014402918795830

Griffin, C. C., Dana, N. F., Pape, S. J., Algina, J., Bae, J., Prosser, S. K., & League, M. B. (2018). Prime online: Exploring teacher professional development for creating inclusive elementary mathematics classrooms. *Teacher Education and Special Education*, *41*(2), 121–139. https://doi.org/10.1177/0888406417740702

Hammersley, M., & Atkinson, P. (2007). *Ethnography*: *Principles in practice* (3rd ed.). Taylor & Francis.

Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, *292*. https://doi.org/10.1016/j.socscimed.2021.114523

Hentges, R. F., Galla, B. M., & Wang, M.-T. (2019). Economic disadvantage and math achievement: The significance of perceived cost from an evolutionary perspective. *British Journal of Educational Psychology*, *89*(2), 343–358. https://doi.org/10.1111/bjep.12242

Hwang, J., Riccomini, P. J., Hwang, S. Y., & Morano, S. (2019). A systematic analysis of experimental studies targeting fractions for students with mathematics difficulties: Fraction instruction. *Learning Disabilities Research & Practice*, *34*(1), 47–61. https://doi.org/10.1111/ldrp.12187

Individuals with Disabilities Education Act. (2018). *Sec. 300.8 Child with a disability*. U.S. Department of Education. https://sites.ed.gov/idea/regs/b/a/300.8

Jakopovic, P. M. (2021). Coaching to develop teacher professional noticing: planning with students and mathematics in mind. *International Journal of Mentoring and Coaching in Education*, *10*(3), 339–354. https://doi.org/10.1108/IJMCE-10-2020-0064

Kalogeropoulos, P., Russo, J. A., Sullivan, P., Klooger, M., & Gunningham, S. (2019). Re-enfranchising mathematically alienated students: Teacher and tutor perceptions of the getting ready in numeracy (G.R.I.N.) program. *International*

Electronic Journal of Mathematics Education, *1*(1). https://doi.org/10.29333/iejme/5881

Kanellopoulou, E. (2020). Learning counting skills through CRA: The case of children with intellectual disability. *Open Access Library Journal*, *07*(3), 1–14. https://doi.org/10.4236/oalib.1106152

Kekeya, J. (2016). Analysing qualitative data using an iterative process. *Contemporary PNG Studies*, *24*, 86–94.

Kim, J., McIntosh, K., Merecer, S., & Nese, R. (2018). Longitudinal associations between SWPBIS fidelity of implementation and behavior and academic outcomes. *Behavioral Disorders*, *43*(3), 357–369. https://doi.org/10.1177/0198742917747589

Klenke, K., Martin, S., & Wallace, J. R. (2016). Case studies in leadership research. *Emerald Group Publishing Limited.* https://doi.org/10.1108/978-1-78560-651-920152004

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. *European Journal of General Practice*, *24*(1), 120–124. https://doi.org/10.1080/13814788.2017.1375092

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. Sage publications.

Küçükalkan, K., Beyazsaçlı, M., & Öz, A. Ş. (2019). Examination of the effects of computer-based mathematics instruction methods in children with mathematical learning difficulties: a meta-analysis. *Behavior & Information Technology*, *38*(9), 913–923. https://doi.org/10.1080/0144929X.2019.1597166

Lee, M. Y., & Cross Francis, D. (2018). Investigating the relationships among elementary teachers' perceptions of the use of students' thinking, their professional noticing skills, and their teaching practices. *The Journal of Mathematical Behavior*, *51*, 118–128. https://doi.org/10.1016/j.jmathb.2017.11.007

Lei, Q., Xin, Y. P., Morita-Mullaney, T., & Tzur, R. (2020). Instructional scaffolds in mathematics instruction for english learners with learning disabilities: An exploratory case study. *Learning Disabilities: A Contemporary Journal*, *18*(1), 123–144.

Lein, A., Harwell, M., & Jitendra, A. (2020). Effectiveness of mathematical word problem solving interventions for students with learning disabilities and/or mathematics difficulties: A meta-analysis. *Journal of Educational Psychology, 112*(7), 1388–1408. https://doi.org/10.1037/edu0000453

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

Luevano, C., & Collins, T. (2020). Culturally appropriate math problem-solving instruction with English language learners. *School Psychology Review*, *42*(2), 144–160. https://doi.org/10.1080/2372966X.2020.1717243

Mazana, M. Y., Montero, C. S., & Casmir, R. O. (2019). Investigating students' attitude towards learning mathematics. *International Electronic Journal of Mathematics Education*, *14*(1), 207–231. https://doi.org/10.29333/iejme/3997

McKenzie, J. F., Wood, M. L., Kotecki, J. E., Clark, J. K., & Brey, R. A. (1999). Establishing content validity: using qualitative and quantitative steps. *American Journal of Health Behavior*, *23*(4), 311–318. https://doi.org/10.5993/AJHB.23.4.9

Mcleod, S. (2023). *Jerome Bruner's theory of learning and cognitive development.* https://www.simplypsychology.org/bruner.html

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. John Wiley & Sons.

Merriam, S. B., & Tisdell, E. J. (2016). Qualitative research: A guide to design and implementation (4th ed.). Jossey-Bass.

Merriam-Webster. (2023). *Mathematics definition and meaning*. *Merriam-Webster.com dictionary*. Retrieved November 14, 2023, from https://www.merriam-webster.com/dictionary/mathematics

Milton, J., Flores, M., Moore, A., Taylor, J., & Burton, M. (2018). Using the concrete-representational-abstract sequence to teach conceptual understanding of basic multiplication and division. *Hammill Institute on Disabilities. 42*(1), 32–45. https://doi.org/10.1177/0731948718790089

Mooney, K. E., Prady, S. L., Barker, M. M., Pickett, K. E., & Waterman, A. H. (2021). The association between socioeconomic disadvantage and children's working memory abilities: A systematic review and meta-analysis. *PLoS ONE*, *16*(12). https://doi.org/10.1371/journal.pone.0260788

Morgan, P. L., Farkas, G., Hillemeier, M. M., & Maczuga, S. (2016). Who Is at-risk for persistent mathematics difficulties in the united states? *Journal of Learning Disabilities*, *49*(3), 305–319. https://doi.org/10.1177/0022219414553849

Mutlu, Y. (2019). Math anxiety in students with and without math learning difficulties. *International Electronic Journal of Elementary Education*, *11*(5), 471–475. https://doi.org/10.26822/iejee.2019553343

National Center for Education Statistics. (2021a). *Concentration of public-school students eligible for free or reduced -price lunch*. U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/clb

National Center for Education Statistics. (2021b). *Characteristics of children's families.* U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/cce

National Center for Education Statistics. (2021c). *English language learners in public schools.* U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/cgf

National Center for Education Statistics. (2021d). *Students with disabilities.* U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/cgg

National Center for Education Statistics. (2023). *Socioeconomic status (SES). The NAEP Glossary of Terms.* Retrieved November 14, 2023, from *https://nces.ed.gov/nationsreportcard/glossary.aspx#e*

National Clearinghouse for English Language-Acquisition. (2022). *Title III grant faqs.* U.S. Department of Education's Office of English Language Acquisition (OELA). *https://ncela.ed.gov/title-iii-grants-faq*

Nelson, G., & Powell, S. R. (2018). A systematic review of longitudinal studies of mathematics difficulty. *Journal of Learning Disabilities*, *51*(6), 523–539. https://doi.org/10.1177/0022219417714773

Nelson, P. M., Van Norman, E. R., Parker, D. C., & Cormier, D. C. (2019). An examination of interventionist implementation fidelity and content knowledge as predictors of math Intervention effectiveness. *Journal of Applied School Psychology*, *35*(3), 234–256. https://doi.org/10.1080/15377903.2019.1568334

Neuendorf, K. (2002). *The content analysis guidebook*. Sage Publications.

Norval, B. (2019). Can we change mathematics test items to be more equitable to ells? (Part 1 of 3). *Ohio Journal of School Mathematics*, *82*, 29–35.

Office of Elementary & Secondary Education. (2022). *Evidence based practices.* U.S. Department of Education, Office of State and Grantee Relations and Evidence Based Practices. *https://oese.ed.gov/evidence-based-practices/*

Peltier, C., & Vannest, K. J. (2018). Using the concrete representational abstract (CRA) instructional framework for mathematics with students with emotional and behavioral disorders. *Preventing School Failure: Alternative Education for Children and Youth*, *62*(2), 73–82. https://doi.org/10.1080/1045988X.2017.1354809

Phillippi, J., & Lauderdale, J. (2018). A guide to field notes for qualitative research: Context and conversation. *Qualitative Health Research*, *28*(3) 381–388 https://doi.org/10.1177/1049732317697102

Piaget, J. (1963). *The origins of intelligence in children*. W.W. Norton.

Powell, S. R., Doabler, C. T., Akinola, O. A., Therrien, W. J., Maddox, S. A., & Hess, K. E. (2020). A synthesis of elementary mathematics interventions: Comparisons of students with mathematics difficulty with and without comorbid reading difficulty. *Journal of Learning Disabilities*, *53*(4), 244–276. https://doi.org/10.1177/0022219419881646

Ramirez, G., Hooper, S. Y., Kersting, N. B., Ferguson, R., & Yeager, D. (2018). Teacher math anxiety relates to adolescent students' math achievement. *AERA Open*, *4*. https://doi.org/10.1177/2332858418756052

Ravitch, S. M., & Carl, N. M. (2016). *Qualitative research*: *Bridging the conceptual, theoretical, and methodological*. Sage.

Rose, D. (2001). Universal design for learning. *Journal of Special Education Technology*, *16*(2), 66–67. https://doi.org/10.1177/016264340101600208

Rosli, R., & Aliwee, M. F. (2021). Professional development of mathematics teacher: A systematic literature review. *Contemporary Educational Research Journal*, *11*(2), 43–54. https://doi.org/10.18844/cerj.v11i2.5415

Rubin, H., & Rubin, I. (2012). Listening, hearing and sharing. *Qualitative interviewing the art of hearing data (p. 1-12).* Sage

Saldana, J. (2016). *The coding manual for qualitative research.* Sage.

Sandelowski, M. (2000). Focus on research methods-whatever happened to qualitative description? *Research in nursing and health, 23*(4), 334–340.

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., & Jinks, C. (2018). Saturation in qualitative research: Exploring its conceptualization and operationalization. *Quality & Quantity 52*, 1893–1907 https://doi.org/10.1007/s11135-017-0574-8

Schwandt, T. A. (2015). *The sage dictionary of qualitative inquiry.* Sage.

Shahsavani, S., Baratail, M., & Keshtiaray, N. (2020). Providing a model for continuous professional development of mathematics teachers based on the brain-education approach: A systematic review. *Archives of Pharmacy Practice*, *11*(1), 42–67.

Sharp, L., Bonjour, G., & Cox, E. (2019). Implementing the math workshop approach: An examination of perspectives among elementary, middle, and high school teachers. *International Journal of Instruction*, *12*(1), 69–82. https://doi.org/10.29333/iji/2019.1215a

Sheppard, M. E., & Wieman, R. (2020). What do teachers need? Math and special education teacher educators' perceptions of essential teacher knowledge and experience. *The Journal of Mathematical Behavior, 59,* 1–4. https://doi.org/10.1016/j.jmathb.2020.100798

Slavin, R. E., Karweit, N. L., & Madden, N. A. (1989). *Effective programs for students at-risk*. Allyn and Bacon.

Slavin, R. E., & Madden, N. A. (1989). What works for students at-risk: A research synthesis. *Educational Leadership*, *46*(5), 4–13.

Soares, N., Evans, T., & Patel, D. R. (2018). Specific learning disability in mathematics: a comprehensive review. *Translational Pediatrics*, *7*(1), 482–462. https://doi.org/10.21037/tp.2017.08.03

Stevens, E. A., Rodgers, M. A., & Powell, S. R. (2018). Mathematics interventions for upper elementary and secondary students: A Meta-Analysis of Research. *Remedial and Special Education*, *39*(6), 327–340. https://doi.org/10.1177/0741932517731887

The Nation's Report Card. (2017). *State performance compared to the nation.* National Assessment of Educational Progress (NAEP). https://www.nationsreportcard.gov/profiles/stateprofile?chort=1&sub=MAT&sj=AL&sfj=NP&st=MN&year=2017R3

The Nation's Report Card. (2019). *State performance compared to the nation.* National Assessment of Educational Progress (NAEP). https://www.nationsreportcard.gov/profiles/stateprofile?chort=1&sub=MAT&sj=AL&sfj=NP&st=MN&year=2019R3

The Nation's Report Card. (2023). *State performance compared to the nation.* National Assessment of Educational Progress (NAEP). https://www.nationsreportcard.gov/profiles/stateprofile?chort=1&sub=MAT&sj=AL&sfj=NP&st=MN&year=2022R3

Thomas-Browne, C. G., Boston, M. D., & Parke, C. S. (2020). Developing a tool to capture productive and unproductive mindsets about teaching, mathematics to

African American students: An initial review. Urban Education, *58*(8). https://doi.org/10.1177/0042085920934859

Tobondo, Y. V., & Retnawati, H. (2018). Constraints and strategy of mathematics teachers in the implementation of Continuing Professional Development (CPD) in disadvantaged areas. *Journal of Physics: Conference Series*, *1097*(1). https://doi.org/10.1088/1742-6596/1097/1/012113

Tomlinson, C. (1999). *The differentiated classroom: Responding to the needs of all learners*. Association of Supervision and Curriculum Development.

Utah State Board of Education. (2019). *Welcome to utah multi-tiered system of supports (UMTSS).* Utah State Office of Education https://uen.instructure.com/courses/314069/wiki

Wall, C., Glenn, S., Mitchinson, S., & Poole, U. (2004). Using reflective diary to develop bracketing skills during a phenomenological investigation. *Nurse Research*, *11*(4), 20–29.

Wilson, A. (2014). A guide to phenomenological research. *Nursing Standard*, *29*(34) 38–43.

Yin, R. (2016). Qualitative research from start to finish (2nd ed.). Guilford Press.

Yin, R. (2018). Case study research and applications design and methods (6th ed.). Sage.

Appendix A: Title of Appendix

Insert appendix content here. Appendices are ordered with letters (Appendix A, Appendix B, etc.) rather than numbers. If there is only one appendix in your document, label it Appendix (rather than Appendix A), per APA rules.

The appendices must adhere to the same margin specifications as the body of the dissertation. Photocopied or previously printed material may have to be shifted on the page or reduced in size to fit within the area bounded by the margins.

If the *only* thing in an appendix is a table or figure, the table or figure title serves as the title of the appendix; no label is needed for the table or figure itself, and it is not included in the List of Tables or List of Figures.

If an appendix contains a table or figure *in addition to other content* (e.g., narrative text, other tables and/or figures), label each table or figure in the appendix with the letter of the appendix and a whole number (e.g., Table A1, Table A2, Figure A1, Table B1, etc.). Items that are individually labeled as tables or figures within appendices must be included in the List of Tables or List of Figures. However, because the table and figure numbering format in this case includes the appendix letter and a numeral, the Insert Caption method for labeling will not work, and you will likely need to create labels and add entries for these items to the List of Tables or List of Figures by hand.

If you include in an appendix any prepublished materials that are not in the public domain, you must also include permission to do so.

Appendix B: Title of Appendix

Insert appendix content here.