

THE ROLE OF PARENTS IN DEVELOPING MATHEMATICAL SKILLS OF THEIR CHILDREN IN GRADE 1

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DECLARATION

I, **SARINAH MANAVHELA**, declare that **“The Role of Parents in Developing Mathematical Skills of Their Children in Grade 1”** is my work and, that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

Manavhela Sarinah

Full names

2025

Date

DEDICATION

This mini-dissertation is dedicated to my husband, Phaniel Manavhela, and our three daughters, Mpho, Thidziambi, and Mukonazwothe, for being compassionate and supportive throughout this project, even when it seemed impossible to complete. It is also dedicated to my siblings, who unconditionally supported me throughout the project and celebrated this achievement as a family with me.

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ABSTRACT:

Parental involvement in children's education from an early age substantially impacts their academic success, which continues into later years. However, many parents face difficulties supporting their children's mathematics learning due to limited mathematical knowledge, low confidence, and a lack of resources. This study explored the role of parents in developing the mathematical skills of their Grade 1 children. The study aimed to identify parents' challenges in helping their children with mathematics, examine how parental involvement influenced children's mathematical performance, and explore strategies parents used to support their children. This study was based on Bronfenbrenner's Ecological Systems Theory (1979), which explains that child development occurs within multiple interconnected systems that influence growth. A qualitative research design focused on parents of Grade 1 children in Mvudi Circuit, Vhembe East District. The sample consisted of sixteen parents selected through purposive sampling. Data were collected using semi-structured interviews and analysed using a thematic approach. The study found that parents who actively participated in their children's mathematics learning by offering guidance, using household materials, and creating a positive learning environment contributed significantly to their children's mathematical progress. It also found that many parents lacked confidence in their mathematical abilities, making it difficult for them to help their children effectively. The unavailability of suitable learning materials worsened this issue. Based on these findings, the study recommends that schools provide workshops and training to help parents develop basic mathematical skills and learn effective strategies for supporting their children. It also suggests that policymakers and educators create and distribute accessible learning resources for parents at home. This study focused only on Grade 1 parents in Mvudi Circuit, Vhembe East District, so its findings may not apply to other areas or grade levels. To ensure trustworthiness, the study used triangulation, member checking, and a clear record of the research process. Ethical considerations included obtaining informed consent, maintaining confidentiality, and protecting participants' identities. The study highlights the vital role of parents in early mathematical development and emphasizes the need for targeted support to help them overcome challenges in assisting their children.

Keywords: *Parental involvement, Early mathematics development, Grade 1 learners, Mathematical support strategies, Home-based learning.*

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ACRONYMS

EPPE: Effective Provision of Pre-School Education

HBL: Home-Based Learning

HME: Home Mathematic Environment

PPC: Parent-Child Connectedness

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND

The early stages of a child's education play a crucial role in shaping their academic foundation, with mathematics being a fundamental component (Sims 2017). The development of young children in the Foundation Phase is crucial for their academic success and prospects. Therefore, parental involvement plays a significant role in enhancing children's mathematical abilities. The Foundation Phase typically encompasses the early years of elementary school, where children are introduced to fundamental mathematical concepts. Therefore, parents play various roles in supporting their children's mathematical development. These roles may include creating a supportive learning environment (Simpson & Linder, 2018). Recent research reviews revealed that most studies on teaching early mathematics have focused on numerical areas with comparatively limited coverage of algebra, geometry, measurement, and data analysis at home, engaging in math-related activities, and reinforcing the importance of mathematics in everyday life (Reikerås 2020). Early childhood is a critical period for developing foundational and mathematical skills.

Parental involvement in children's education from an early age significantly affects educational achievement and continues to do so into adolescence and adulthood (Crosnoe & Ressler, 2019). While schools and educators play a vital role in teaching mathematical concepts, parental involvement is increasingly recognised as a key factor in the holistic development of a child's mathematical skills. Parents' attention and input can help and motivate children to achieve better in their studies, regardless of their social, educational, or ethnic background (Dahie, Mohamed, & Mohamed, 2018). In the lower grades, the partnership between parents and educators is especially important since it lays the groundwork for a child's future academic achievement.

The role of parents in the development of their children's mathematical skills is pivotal and extends far beyond simply supporting academic progress. Parents serve as primary influencers in shaping a child's attitude, motivation, and overall approach to mathematics (Thomas & Strunk, 2017). This critical role begins in early childhood and

continues throughout the educational journey. In this introduction, the researcher will explore the multifaceted aspects of the parental role in fostering and enhancing learners' mathematical skills. Beyond aiding with homework, parents contribute to the development of mathematical skills by creating an environment that fosters curiosity and exploration. Everyday activities such as cooking, shopping, and playing games can be transformed into opportunities for informal learning. By integrating mathematical concepts into these daily routines, parents help children recognize the practical applications of Mathematics and understand its relevance in their lives. Since the 2009 Conference of European Research in Mathematics Education, there has been a call for studies exploring mathematics education in early childhood from various perspectives (Linder & Simpson, 2018). As children progress through their education, parental involvement evolves to include effective communication with teachers, monitoring academic progress, and addressing any challenges that may arise. Parents can actively support their child's learning journey by staying informed about their child's mathematical curriculum and participating in parent-teacher conferences.

The study on the parental role in developing learners' mathematical skills explores parents' influence on their children's mathematical development (Thuba, Kathuri, & Mariene, 2017). This study is rooted in the understanding that early mathematical skills are crucial for a child's academic success and cognitive development. Therefore, the goal of this study is to investigate the role that parents play in developing mathematical skills in Grade 1.

The quality and content of parental involvement matter more for children's outcomes than the quantity of time parents spend with their children (Mínguez, 2019). Family learning can also provide a range of benefits for parents and children, including improvements in reading, writing, and numeracy and greater parental confidence in helping their child at home (Fallesen & Ghler, 2019).

A supportive attitude from parents toward their children's education enhances both the home and school learning environments and makes it easier for parents to comprehend how their kids learn (Arapi & Hamel, 2021); (Bartnikowska, Ćwirynkało & Fronek, 2022). According to Orell and Pihlaja (2020) and Puccioni, Froiland, & Moeyaert (2020), effective parent-teacher working relationships and practical

communication can also aid in removing any miscommunication or mistrust that may develop between parents and teachers.

Most children have two foremost educators in their lives – their parents and their teachers. Parents are the prime educators until the child attends an early year setting or starts school, and they remain a significant influence on their children's learning throughout school and beyond. The school and parents have crucial roles (Giraldo-García, 2018). There is no universal agreement on what parental involvement is; it can take many forms, from involvement at the school (as a governor, helping in the classroom or during lunch breaks) through to reading to the child at home, teaching songs or nursery rhymes, and assisting with homework.

This can be categorized into two broad strands:

- Parents' involvement in the life of the school.
- Their involvement in support of the individual child at home.

This must be focused on the second of these, as there is consistent evidence of the educational benefits of involving parents in their child's learning at home. Because of the complex interaction between several factors (and only some of which have been considered in the analysis), it is difficult to prove that one causes the other; the research instead demonstrates that a relationship exists between parental involvement and achievement.

According to EPPE (2017), parents are more likely to see a child's education as mainly or wholly their responsibility (28%) in 2007 compared to previous years, and nearly half (45%) of parents believed that they had equal responsibility with the school. Parents also now participate in a wider range of activities with their children. Epstein (2018) stated that these include doing school projects together (83%), making things (81%), playing sports (80%), and reading (79%).

The involvement of parents is an accelerating and encouraging factor in their children's education, and this is a worldwide accepted fact. The research looks at the importance of parents helping their children acquire mathematical skills.

Unquestionably, there is proof that children with their parents who are actively involved in their education achieve greater levels. To bridge and link children's learning at home and at school, parents' active involvement and positive attitude can be crucial,

(Puhrová 2018; Schmid & Garrels, 2021). In a similar vein, parental involvement in school and involvement in their academic work at home convey to children the value of education (Bartnikowska, Ćwirynkało, & Fronek, 2022).

Mathematics is needed in everyday life; For example, it may be counting money after buying a lollipop. This is great news for parents because we can talk with our children about mathematics in fun, natural ways. And this kind of mathematics talk is important. Studies show that a child's mathematical skills in Grade 1 are a better predictor of future academic success than reading skills, social skills, or the ability to focus, (Foley, Herts, Borgonovi, Guerriero, Levine & Beilock, 2017). This way, parents can give children a head start by helping them get comfortable with mathematic concepts like measuring and counting at home and while playing with other kids.

1.2 STATEMENT OF THE PROBLEM

Despite the crucial role that parents play in developing their children's mathematical skills, many parents are unaware of how to effectively support their children's mathematics learning in Grade 1. Parents' lack of support can hinder children's development of foundational mathematics skills, leading to difficulties with mathematics later in their academic careers. Research has shown that parental involvement in children's mathematics impacts their academic achievement, but parents lack the knowledge and resources needed to effectively support their children in learning mathematics (Malik, Rafique, & Qayyum (2020); Mughal (2020). The problem in this study was the need for parents to understand the importance of their role in their children's mathematics education and to be equipped with the knowledge and resources necessary to effectively support their children's mathematics learning in the Foundation Phase. Therefore, this study sought to investigate the role of parents in developing the mathematical skills of their children in the Foundation Phase.

1.3 RESEARCH AIM AND OBJECTIVES

The aim of this study is to explore the role played by parents in developing the mathematical skills of their children in Grade 1.

To achieve this aim, the study was supported by the following objectives:

- To identify challenges parents faced when helping their children in mathematics.
- To investigate parental role in developing mathematical skills of their children.
- To investigate the impact played by parents on their children's mathematical performances.
- To identify strategies parents can use to help their children with mathematics.

1.4 RESEARCH QUESTIONS

The following research questions guided the study:

- What challenges are parents faced with when helping their children in mathematics?
- To what extent do parents play a role in developing their children's mathematical skills?
- What is the impact of parental involvement in the development of their children's mathematical skills?
- Which strategies can be used by parents in the development of their children's mathematical skills?

1.5 DEFINITION OF CONCEPTS

In this study, the following key terms related to the impact of parental involvement in developing learners' mathematical skills are defined:

1.5.1. Parental involvement

Parental involvement refers to the active participation, engagement, and support of parents or caregivers in their children's educational and developmental processes. In the context of mathematics, it involved parents taking an interest in and contributing to their children's learning and skill development in mathematical concepts and problem-solving (Oranga, Obuba, Sore, & Boinet, 2022). Parental involvement is associated with improved academic achievement, higher self-esteem, and better social skills in children.

1.5.2. Early exposure

Early exposure refers to the introduction of children to mathematical concepts and activities from a young age, (Purpura, Logan, Hassinger-Das, & Napoli, 2017). The idea behind early exposure was often rooted in the belief that early experiences can have a lasting impact on a child's development. It was important to note that the quality and nature of early exposure play a significant role in shaping a person's growth and development.

1.5.3. Mathematical skills

Mathematical skills encompass a range of abilities related to the understanding, manipulation, and application of mathematical concepts. These skills included numeracy, problem-solving, logical reasoning, spatial awareness, and mathematical communication. (Borovik and Gardiner;2019). Developing mathematical skills is a gradual process that involved both learning and application. They contributed to a person's overall cognitive development and problem-solving abilities.

1.5.4. Homework support

Homework support involves parents assisting their children with mathematical assignments and providing guidance on problem-solving strategies, (Boonk et al. 2018). Homework support is integral to a child's mathematical development, providing

opportunities for practice, application, independent learning, and the reinforcement of essential skills. It contributed to a well-rounded education and prepares students for future academic challenges.

1.6 SIGNIFICANCE OF THE STUDY

This study was a significant endeavour that promoted educational concerns such as parents' role in developing their children's mathematical skills. This study was beneficial not only to parents and children but also to educators. By understanding the needs of learners and benefits of the quality education, educators were assured of a large progress performance. This research provided recommendations on how to value learners as they were taking a large part in the overall performance of the school's quality education.

1.7 STRUCTURE OF THE RESEARCH PROJECT

The study adhered to the following outline:

Chapter 1 contained an introduction and background of the study, problem statement, aim and objectives, research questions, and definition of concepts.

Chapter 2 comprised of theoretical framework and literature review on parents' role in developing their children's mathematical skills.

Chapter 3 focused on the research design and methodology.

Chapter 4 presented data analysis and interpretation of the findings of the study.

Chapter 5 focused on the summary, recommendations, and conclusion.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Mathematics education aims to produce mathematically literate citizens who possess critical and analytical thinking abilities, including the ability to solve problems, reason mathematically, make connections between ideas, and communicate mathematically. The objective is to attain the targeted goal by providing all children, regardless of background or situation, with high-quality mathematical instruction, developing strong cognitive abilities, and promoting desired cognitive values. The partnerships between schools and parents foster collaborative efforts, and parents' involvement in their children's education can raise children's academic attainment (Puccioni, Froiland, & Moeyaert, 2020).

Given that parental involvement and school autonomy are positively correlated, parental involvement becomes even more important. More autonomy would make parental involvement stronger and turn it into a positive force that will improve school efforts for the benefit of their children (Grant & Ray, 2013), especially in terms of their academic performance (Robinson & Harris, 2014).

One of the core subjects that has a significant impact on a child's academic progress and cognitive development is mathematics. Preschool exposure to mathematics ideas and abilities is crucial for laying a solid basis for further education. Parents are vital in supporting their children's mathematical development, especially in the formative years of schooling, even though formal education offers structured instruction in mathematics. This research review looks at how parents help their children develop their mathematics skills.

Studies show that parents' participation in mathematical activities has a favourable impact on their children's mathematics achievement, Goodall & Montgomery (2014). At home, parents can involve their children in a variety of mathematics activities, like

counting things, number games, and simple problem-solving. These exercises foster a good attitude toward mathematics in addition to supporting classroom learning.

Parents are influential role models when it comes to their children's attitudes and views around mathematics. According to studies, children who hear their parents talk positively about mathematics are more likely to become confident and interested in the subject, Boiler (2013). Parents can help their children develop a growth mindset and see mathematics as a fun and fulfilling endeavour by modelling a growth mindset through their own excitement for mathematical projects and persistence in the face of difficulties.

Academic success depends on parents and children having effective communication about mathematical ideas and homework. Parents can help their children by talking to them about math issues, giving advice, and complimenting their efforts. Establishing a home-based learning atmosphere that is encouraging and allows children to ask for assistance when they need it helps them feel confident and in control of their mathematics skills, Ginsburg. (2017).

To assist their children in studying mathematics, parents can use various tools, such as instructional books, online guides, and educational applications, Jay, Rose, and Simmons (2018). Outside the classroom, these resources give children more chances to practice and reinforce their mathematical skills. To ensure consistency and continuity in mathematics learning experiences, parents and teachers can work together to match classroom instruction with at-home learning activities.

2.2 THEORETICAL FRAMEWORK

This study is grounded in Bronfenbrenner's Ecological Systems Theory (1979). This theory suggests that child development occurs within a set of interconnected systems, with each layer affecting the child's growth. This theory is helpful in examining the factors that influence a Grade 1 learner's mathematical development, especially focusing on the role of parents within the larger context of home and community environments. It is also suitable as it highlights the various layers of influence on a child's development, particularly the family and the broader social context, which are

crucial for understanding the impact of parental involvement in children's mathematical learning.

Microsystem: The microsystem is the immediate environment in which the child interacts, such as family, school, and peers. For this study, the parent-child relationship is crucial. The ways parents engage in daily learning activities, provide support, and offer resources for developing mathematical skills are vital to this system. Research has shown that when parents actively participate in their children's learning, such as through math-related games or interactive counting, they significantly contribute to the development of numeracy skills (Ginsburg, 2007).

Mesosystem: The mesosystem describes the connections between different aspects of the microsystem, such as the relationship between parents and teachers. Effective communication and cooperation between parents and educators can strengthen the development of mathematical skills. Parental involvement in school activities, supporting homework, and attending parent-teacher meetings can positively influence a child's learning experience (Desforges & Abouchaar, 2003).

Exosystem: The exosystem includes external environments that affect the child indirectly, such as community resources or the parental workplace. Parents with access to educational materials, after-school programs, or flexible work environments are better able to support their children's mathematical learning. Research suggests that socioeconomic factors, which are part of the exosystem, can determine the amount of time and resources available for supporting education (Jeynes, 2005).

Macrosystem: The macrosystem includes broader societal and cultural influences that shape educational practices and values. The societal emphasis placed on education and mathematics will influence how parents engage in their children's learning. In cultures that prioritize academic success, parents are more likely to engage in activities that support early mathematical development (Bronfenbrenner, 1979).

Bronfenbrenner's Ecological Systems Theory is appropriate for this study because it offers a comprehensive view of the different factors influencing children's mathematical development. It allows for an exploration of how parental involvement,

within the context of multiple environments, supports or hinders a child's learning. This framework provides a well-rounded perspective on early mathematical learning by examining how home, school, community, and societal factors interact.

The flexibility of this theory makes it adaptable to various research methods. Interviews, observations, and surveys can all be used to gather data on how parents influence their children's mathematical development. The focus on the environment, rather than just the individual child or parent, makes this theory particularly useful for understanding the broader external factors that shape children's mathematical skills.

Bronfenbrenner's Ecological Systems Theory provides a solid foundation for studying the role of parents in developing mathematical skills in Foundation Phase Grade 1 children. The theory's focus on the interconnected systems of influence allows for a deeper understanding of how parents' actions and other factors contribute to their children's academic success. This framework will help to explore the various ways in which parents' involvement within different layers of their environment impacts early mathematical learning.

According to Lembrér (2020), parents are acknowledged as a child's primary instructors and play a significant role in shaping their mathematics knowledge and abilities. The researcher focuses on what parent's value in the mathematics activities their children engage in at home to learn what experiences children bring into preschool education and, therefore, might inform their contact with mathematics.

A number of other research looked into how kids interacted with play. Henschen (2016) looked at unstructured play, while Nakken, Grimeland, Nergard, & Thiel (2016) contrasted unstructured and supervised play, finding that the latter led to children's involvement with more specialized mathematical concepts and deeper mathematical reasoning. Anderson and Anderson (2018) expanded the focus by examining how children pick up mathematics in their homes. The study conducted by Thom (2018) and Elia (2018) on geometrical and spatial thinking in early infancy provided an additional understanding of the critical role that the body plays in the development and communication of spatial-geometrical thinking in young children, as well as other semiotic resources (language, drawings, and artifacts).

Children actively explore their surroundings and engage with adults in their immediate context to build their understanding of mathematics at various levels. Parents can use this idea as a guide to help their children develop their mathematical abilities. Parents talk to their kids about arithmetic on a regular basis using mathematical terminology. Studying about quantity, size, and comparisons, as well as the words that represent numbers, is the first step in studying mathematics. Learning mathematics begins with counting actual objects with parents, playing with food or toys to understand concepts of less and more or full and empty, and generalizing concepts of mass with greater and smaller (Mazzocco & Thompson, 2015).

According to Ricci & Pritscher (2015), every child develops at a different rate, so it's critical to support and accommodate each one's needs, particularly when it comes to maths. Using cognitive developmental theory as a guide, parents may help their children acquire a solid foundation in mathematics by creating a dynamic and encouraging environment that promotes inquiry and critical thinking. Research indicates that various factors, including parenting styles, family activities, socioeconomic position, and family roles, impact how early children develop their social-emotional competencies (Liu, Peng, & Luo, 2020; Schapira & Aram, 2020).

Youngsters absorb information and think about it differently. This discrepancy results from the ways in which they process information at different ages and stages (Ummah, 2018). As a result, learning and teaching mathematics will require a wide range of skills and talents, which will improve children's mathematical reasoning. One of the subjects that helps children enhance their thinking skills is mathematics (Önal, İnan, & Bozkurt 2017). Its content evolved positively, with the following foundations: social interaction, history, and the psychological genesis of ideas. This knowledge is the culmination of various ideas and concepts that have been combined. Certain fundamental principles have undoubtedly been transformed into even more intricate and sophisticated conceptions. In order to understand the idea, psychology, and logical reasoning are needed (Cappetta, 2017).

2.3 EMPIRICAL LITERATURE

Parents play a crucial role in the development of their children's mathematical skills during lower grades. Through everyday interactions and activities, parents can significantly contribute to fostering a strong foundation in mathematics.

2.3.1. CHALLENGES FACED BY PARENTS IN DEVELOPING MATHEMATICAL SKILLS OF THEIR CHILDREN.

The majority of parents are hesitant to support early mathematics instruction. They might be ignorant of the things their children should and can learn. Most of them cannot predict how they would help their children learn mathematics. Educators must support parents who lack confidence or have a negative attitude for children's learning and development of mathematical skills. When youngsters are struggling to learn mathematics, parents can help them. Even though the arithmetic tasks are challenging, they motivate children to put in much effort. They inspire children to acquire mathematics effectively and do well on subject assignments.

According to Kastner (2020), parents play a crucial role as motivators in helping their children become dedicated and feel like they belong, which helps them accomplish greater results more quickly. Parents' ability to raise their own standards is influenced by their confidence level. Numerous social, economic, and environmental issues can have both beneficial and harmful effects on young children. Due to their vulnerability, children are impacted by things parents take for granted. Several issues impact children's development. There are several challenges affecting children's development.

Young children can be affected by many social, economic, and environmental challenges, both positively and negatively. There are things that parents take for granted that affect children as they are vulnerable. There are several challenges affecting children's development.

Parents are crucial in fostering the growth of their children's mathematical abilities. However, they typically encounter a variety of challenges in the process. These challenges may vary depending on the child's age, learning style, and parents' comfort level with mathematics.

In order to overcome these obstacles, a variety of tactics may be needed, such as asking instructors or other educational specialists for assistance, using educational resources, encouraging a positive attitude toward mathematics, and customizing activities to the child's interests and requirements.

2.3.1.1. Limited Knowledge of Mathematics

Many parents struggle to assist their children with mathematics due to their own limited understanding of the subject. According to Arapi and Hamel (2021), parents who lack confidence in their mathematical abilities may feel insecure and uncomfortable when trying to help their children. This lack of confidence can make it difficult for them to provide adequate support, leading to missed learning opportunities for their children. Similarly, Dwyer & Hecht (2019) note that not all parents engage in their children's education as actively as schools expect, partly due to their own struggles with mathematical concepts.

Parents with a weak grasp of mathematics may struggle to guide their children in problem-solving and mathematical reasoning. Their difficulties may stem from gaps in their own education or a lack of exposure to modern teaching methods. When parents struggle with basic mathematical concepts, they may avoid helping their children or provide incorrect explanations, hindering their children's learning progress.

Parental beliefs about early mathematics development also influence their support level. Research indicates that parents have different perspectives on their children's mathematical abilities, affecting how often and effectively they engage in math-related activities at home (Douglas, Zippert, & Rittle-Johnson, 2021). For instance, parents who place a high value on early mathematical development tend to offer more frequent and advanced support to their children (Napoli, Korucu, Lin, Schmitt, & Purpura, 2021; Skwarchuk, Sowinski, & LeFevre, 2014). On the other hand, parents who perceive their children as already competent in mathematics may assume less support is needed and, therefore, provide less assistance (Uscianowski, Almeda, & Ginsburg, 2020; Zippert & Ramani, 2017; Zippert & Rittle-Johnson, 2020).

The variability in parental involvement suggests that efforts should be made to enhance parents' mathematical confidence and knowledge. Providing workshops or accessible resources could help bridge this gap, ensuring parents feel more equipped to support their children effectively. Addressing these challenges is essential in fostering a strong foundation in mathematics for young learners.

2.3.1.2. Lack of Resources

The availability of educational resources plays a crucial role in parental involvement in children's mathematics learning. However, many parents face challenges due to insufficient materials, such as books, games, or internet-based tools, making it difficult for them to engage their children in mathematical activities effectively. Ahmed, Rönkä, & Perälä-Littunen (2022) emphasize that the absence of these resources creates barriers to meaningful parental involvement, limiting opportunities for children to practice and develop their mathematical skills at home.

Research suggests that access to educational resources significantly influences the extent of parental participation in mathematics learning. Jay et al. (2018) found that parents with access to books, online resources, private tutors, and family members with mathematical knowledge were likelier to engage in their children's learning. These resources provided parents with structured materials and guidance, enabling them to support their children in understanding mathematical concepts and problem-solving techniques. Conversely, parents with limited access to such resources often struggled to provide adequate support, which could lead to gaps in their children's mathematical development.

The way parents utilize educational resources also affects children's learning experiences. According to Drews (2015), the ability to use available materials in diverse ways enhances children's opportunities for investigational and collaborative work. When children engage in hands-on activities, interactive games, and problem-solving exercises, they are more likely to develop logical reasoning and a deeper understanding of mathematical concepts. Purposeful mathematical discussions between parents and children can further strengthen these skills, encouraging critical thinking and problem-solving abilities.

Given the importance of educational resources in fostering mathematical learning at home, there is a need for greater accessibility to quality materials. Schools and policymakers should consider initiatives such as distributing learning materials to families, providing free online resources, or organizing community-based support programs. Ensuring that all parents, regardless of their socioeconomic background, have access to essential mathematical resources can improve parental involvement and better learning outcomes for children.

2.3.1.3. Time Constraints

Time constraints significantly challenge parental involvement in children's mathematics education. Many parents have demanding work schedules, household responsibilities, and other commitments that limit their time to support their children's learning. According to Dwyer and Hecht (2019), busy schedules and competing priorities often prevent parents from engaging in structured mathematics activities or assisting with homework. As a result, children may not receive the necessary guidance and reinforcement to develop their mathematical skills effectively.

Researchers, educators, and education systems have widely recognized the importance of parental involvement in children's academic performance and behavior (Epstein, 2018). When parents actively engage in their children's education, they can provide encouragement, monitor progress, and create a supportive learning environment at home. Time constraints can reduce the frequency and quality of these interactions, limiting their overall impact on children's mathematical development.

Parental involvement has been defined as “motivated parental attitudes and behaviours intended to influence children's educational well-being” (Vukovic, Roberts & Wright, 2013). This involvement can take many forms, including helping with homework, discussing school activities, and encouraging problem-solving skills. However, when parents have limited time, they may struggle to provide consistent support, leading to missed learning opportunities and reduced confidence in mathematics.

Research suggests that children benefit most when parents engage in meaningful learning interactions rather than simply supervising their work. Even brief but focused

engagement, such as discussing mathematical concepts during daily routines, playing math-related games, or using technology-based learning tools, can positively impact children's mathematical development. Schools and educators can support time-constrained parents by providing flexible resources, such as online learning platforms, instructional videos, and take-home activities that fit within parents' schedules.

Addressing time constraints requires a collaborative approach between schools, policymakers, and families. Schools can organize workshops to help parents integrate mathematical learning into daily routines, while policymakers can explore policies that promote work-life balance for parents. By creating supportive structures, parents may find engaging in their children's mathematics education easier despite time limitations, ultimately fostering better learning outcomes.

2.3.1.4. Mathematics Anxiety

Mathematics anxiety is a significant challenge that can negatively affect both parents and children. Parents who experience fear or anxiety related to mathematics may unintentionally transfer these emotions to their children, leading to negative attitudes toward the subject. This transmission of anxiety can impact children's confidence, engagement, and overall performance in mathematics. Research by Soni and Kumari (2017) suggests that parents' mathematics anxiety can contribute to the development of similar feelings in their children, making it more difficult for them to approach mathematics with a positive mindset.

Mathematics anxiety is a complex phenomenon with both cognitive and emotional dimensions. When faced with mathematical tasks, it can cause individuals to feel stress, nervousness, or helplessness. These feelings often lead to avoidance behaviours, where parents may hesitate to help their children with math-related activities due to their own discomfort. Recognizing and addressing mathematics anxiety is crucial for fostering mathematical confidence, competence, and enjoyment among learners of all ages.

Research indicates a direct correlation between parents' mathematics anxiety and their children's arithmetic proficiency, even as early as prekindergarten (DiStefano

O'Brien, Storozuk, Ramirez, & Maloney, 2020). Parents with high levels of math anxiety may have unpleasant emotional experiences when assisting their children with math-related tasks. These negative emotions can become internalized by children, affecting their perception of mathematics and leading to lower performance levels.

External factors such as social interactions and classroom experiences can also contribute to the development of mathematics anxiety in children. According to Sokolowski and Ansari (2017), children who struggle with learning numbers during their early years or encounter specific social situations, such as peer pressure or teacher discouraging attitudes—are more likely to develop mathematics anxiety. This anxiety can persist into later academic years, affecting their ability to engage with and succeed in mathematics.

To address this issue, schools and educators can play a proactive role by offering resources and support to parents. Workshops and training sessions that help parents develop a positive attitude toward mathematics and equip them with strategies to support their children can be beneficial. Using engaging and interactive learning methods, such as games, storytelling, and real-life applications of mathematics, can help reduce anxiety and foster a more positive learning experience for parents and children. Encouraging a growth mindset, where mistakes are viewed as learning opportunities, can help children and parents overcome their fears and build confidence in mathematics.

2.3.1.5. Misconceptions About Learning Mathematics

Misconceptions about how children learn mathematics can significantly impact the effectiveness of parental support. Some parents believe that memorization of mathematical facts and procedures is more important than developing a deep understanding of concepts. This perspective can lead to a limited approach to learning, where children focus on rote memorization rather than problem-solving and reasoning. According to Rakes and Ronau (2018), such beliefs can hinder children's ability to develop strong mathematical foundations, as understanding concepts is essential for long-term success in mathematics.

Kennedy (2019) emphasizes that students are more likely to succeed in mathematics when they develop a positive attitude toward the subject. Parents play a critical role in shaping this attitude through involvement in their children's education. Parents with misconceptions about mathematics learning may unintentionally reinforce negative perceptions or ineffective study habits, impacting their children's confidence and motivation.

Parental involvement in children's education directly and indirectly affects their skill development. Directly, parents can encourage children to practice mathematical skills and provide support when needed. Indirectly, they influence their children's motivation and self-confidence. Motivation development models suggest that when parents actively assist their children in their learning at home, they help them build critical motivational resources (Kennedy, 2019). These include self-assurance in completing mathematical tasks and understanding mathematical knowledge's relevance in daily life.

A key issue arising from misconceptions about mathematics learning is the underestimation of conceptual understanding and problem-solving skills. Some parents may focus on helping their children complete homework without emphasizing the reasoning behind mathematical processes. This can result in children struggling with applying their knowledge to new or unfamiliar problems. Research suggests that when children develop a deeper understanding of mathematical principles, they are better equipped to apply these skills in different contexts and demonstrate higher levels of achievement (Kennedy, 2019).

To address these misconceptions, educators and schools can provide guidance on effective strategies for supporting mathematics learning at home. Parent education programs, workshops, and informational resources can help parents understand the importance of conceptual learning alongside skill practice. Encouraging interactive and practical approaches, such as using everyday situations to explore mathematical concepts, can also help parents and children engage with mathematics meaningfully. By addressing misconceptions and promoting a well-rounded approach to mathematics learning, parents can better support their children's academic development and foster a positive attitude toward the subject.

2.3.2. THE IMPORTANCE OF PARENTAL INVOLVEMENT IN DEVELOPING MATHEMATICAL SKILLS OF THEIR CHILDREN

Parental involvement is essential in developing mathematical skills in children. It helps with skill acquisition and promotes a positive attitude, confidence, and a lifelong appreciation for mathematics. Parents can play an active role in nurturing their children's mathematical abilities by being supportive, encouraging, and involved in their learning journey.

2.3.2.1 Parent-Child Bond

The bond between parents and children is crucial in shaping the overall development of children, including their academic skills, such as mathematics. According to Bartley and Ingram (2018), a positive and supportive relationship between parents and children allows children to learn more about themselves and their world. The early establishment of a secure and healthy attachment to parents provides a strong foundation that helps children grow into individuals who can confidently face challenges. This emotional bond influences their academic success and ability to navigate social and emotional situations.

A secure parent-child relationship contributes significantly to a child's overall well-being, including their ability to engage in learning activities. Children who feel emotionally supported by their parents are more likely to be motivated and open to learning new concepts, including mathematical skills. This secure emotional environment also helps children develop self-esteem, resilience, and problem-solving abilities, all essential for academic achievement.

Busygina et al. (2019) suggest that when the bond between parents and children is strong, characterized by affection, warmth, and trust, the emotional climate within the family becomes more positive. In such a context, parents and children enjoy spending time together, engaging in activities, and communicating openly. This positive emotional connection encourages mutual respect and understanding, strengthening the relationship and fostering a nurturing learning environment. As a result, children in

these environments are more likely to thrive academically, as they feel secure in their ability to seek guidance and support when needed.

High levels of parent-child connectedness reduce the likelihood of conflict and resentment. When parents and children share a strong bond, there is less chance of negative interactions, which can otherwise undermine a child's motivation to learn or engage with their parents' help. Instead, the relationship becomes one of mutual support, where parents are seen as reliable sources of assistance, and children feel comfortable asking questions or seeking clarification on challenging subjects like mathematics.

In mathematics education, this strong parent-child bond is particularly important. When parents are emotionally connected to their children, they are more likely to actively participate in their children's learning process actively, offering emotional encouragement and intellectual guidance. This involvement improves the child's mathematical abilities and fosters a positive attitude toward the subject. Therefore, the parent-child bond is a key factor in supporting children's academic success, especially in subjects that may require persistence and emotional resilience, such as mathematics.

2.3.2.2 Communication Skills (Between Parent and Child - Improves)

Effective communication between parents and children is a fundamental aspect of a child's overall development, including their academic progress in mathematics. According to Latunde (2017), good communication between parents and children is one of the most essential skills in fostering a positive relationship. It creates an environment where children feel comfortable discussing challenging topics they may encounter at school and in life. When parents communicate effectively with their children, they help build trust, understanding, and emotional support, which are crucial for their well-being and academic success.

Zhou and Zhang (2018) highlight that the formation of small groups can enhance mathematical communication skills, as it provides students with the opportunity to express their ideas in a more focused and intense manner. In small group settings,

each student is more likely to actively participate in discussions, allowing them to communicate their thoughts more effectively. This approach also fosters a sense of collaboration and peer learning, where students can discuss mathematical concepts, explain their reasoning, and clarify any doubts with one another. Developing mathematical communication skills in these settings contributes to a deeper understanding of the subject, as students practice articulating their thoughts and reasoning.

For children, communicating their ideas clearly with their parents and others provides a platform to demonstrate what they have learned. When children can express their understanding of mathematical concepts, it reinforces their knowledge and boosts their confidence. According to Latunde (2017), once children grasp the language of mathematical terms, symbols, and concepts, they become more comfortable in expressing their ideas. This ability to communicate mathematical thoughts clearly enhances their academic performance and helps them to develop problem-solving skills. When parents actively engage in these communication exchanges, they can provide valuable feedback, offer additional explanations, and encourage their children to think critically about their mathematical understanding.

The ability to communicate mathematical ideas effectively is an essential skill that supports children's learning. Parents play a key role in this process by engaging in open, supportive conversations with their children about mathematics. As children learn to express their thoughts in the language of mathematics, they become better equipped to tackle more complex mathematical problems and develop a positive attitude toward the subject. Therefore, effective communication between parents and children contributes significantly to the child's academic success, particularly in subjects like mathematics that require clear expression of ideas and logical reasoning.

2.3.2.3 Early learning foundation/Early exposure

According to Björklund, Pramling, Samuelsson, and Reis (2018), everyday activities like counting, looking at shapes, and talking about sizes can help children develop early numeracy and mathematical skills. Parents can build children's numeracy and

mathematical skills through play. Try singing several songs and sorting toys together. Children need mathematical skills to do everyday things like solving problems, analysing, and making sense of information. Some essential Math skills include number recognition, counting, and sorting. These skills lay the foundation for more complex concepts like addition and subtraction. Therefore, parents and caregivers must provide children opportunities to practice these early mathematics skills (Gasteiger & Benz, 2018).

Early mathematics covers a range of fundamental concepts, such as numbers, measurement, spatial relationships, forms or shapes, and pattern recognition (Harris & Petersen, 2017). Children investigate these concepts when interacting with their environment because they are inherently curious about the world (Harris & Petersen, 2017). Young children can explore math while playing, such as when they build towers out of blocks. They learn to sort the blocks by size and colour, pay attention to spatial relationships, and build reasoning skills; they learn which forms can be stacked on top of one another, which ones will topple the tower they have made, and how to mix shapes to make familiar items (Harris & Petersen, 2017).

2.3.2.4 Positive attitude towards mathematics

According to Kim (2020), making every encounter with arithmetic enjoyable is how parents can help their children develop a good attitude toward the subject. It is essential to help and encourage children during homework, practice, and exams so they stay motivated and feel secure in their mathematical abilities. Parents are a child's initial point of contact; thus, how they act and think about mathematics can impact the youngster. Parents should inspire and foster a good attitude toward mathematics outside of the classroom from a very early age. As stated by Ceka and Murati (2016), when parents are involved in their children's education, the results are typically supportive and constructive.

Parents are children's first point of contact, so their attitude and behaviour towards math can influence their child's perspective. Parents need to motivate and encourage a positive attitude towards mathematics outside of school, starting at a noticeably young age (Kastner 2020). Parents who are actively involved in their education can instil positive arithmetic attitudes in children from an early age. Parents may encourage

a lifetime love of mathematics in their children by demonstrating an enthusiasm and interest in mathematical activities. This will help the youngsters see mathematics as fun and relevant to everyday life.

2.3.2.5 Reinforcement of Learning

Reinforcement of learning plays a crucial role in the development of young children's mathematical skills. Verhoeven, Van Baar, and Dekovic (2019) state that young children thrive on praise and positive reinforcement. This is especially important in the context of learning mathematics, where encouragement and recognition of progress can significantly enhance a child's motivation and engagement with the subject. When parents consistently reinforce their child's efforts, they help foster a positive learning environment that supports skill development and academic confidence.

For example, if a child is struggling with a task such as sorting shapes by color, it is important for parents to recognize even the small efforts the child makes. Parents reinforce the idea that effort and persistence are valuable by encouraging the child and acknowledging their attempts, even if they are not yet perfect. This positive reinforcement can take the form of praise, rewards, or simply offering encouragement like "Good job for trying!" Such gestures help the child feel supported and motivated to continue working on the task, leading to gradual improvement in their mathematical skills.

Kastner (2020) further emphasizes the role of motivation in learning. A motivator, such as a supportive parent, plays a key role in ensuring that the child remains committed to the task at hand. When children feel supported by their parents, they develop a sense of belonging and are more likely to stay focused on their goals. This sense of emotional support encourages them to put in the effort required to achieve better results. In the context of learning mathematics, the reinforcement provided by parents helps children develop a positive attitude toward the subject, making them more likely to engage with and enjoy solving mathematical problems.

The reinforcement of learning is also vital for building a child's self-confidence in their mathematical abilities. When children see their efforts are valued and rewarded, they are more likely to persist in their learning, even when faced with challenges. This, in

turn, leads to a greater sense of competence and achievement, which further strengthens their desire to learn and succeed in mathematics.

The reinforcement of learning is an essential component of the learning process, particularly in the development of mathematical skills. By consistently offering praise and encouragement, parents play a critical role in supporting their children's mathematical progress. Positive reinforcement helps children develop a growth mindset, boosts their confidence, and motivates them to continue improving their skills, ultimately leading to more tremendous academic success in mathematics.

2.3.2.6 Critical Thinking and Problem Solving

Critical thinking and problem-solving are vital skills that support children's ability to succeed in mathematics. According to English and Kirshner (2016), critical thinking in mathematics involves making reasoned decisions or judgments about how to approach a problem. Instead of simply guessing or following a rule without considering its relevance, children are encouraged to assess the criteria for their decisions and think carefully about how to solve a problem. This process helps them become more intentional and strategic in their approach to mathematical tasks.

Research shows that children can start developing critical thinking skills at a young age (Schoenfeld, 2023). These skills are nurtured through everyday interactions, particularly children's back-and-forth conversations with important adults, such as their parents. Such interactions help children practice reasoning, evaluate different perspectives, and make informed decisions about approaching mathematical challenges. Parents play a key role in fostering these skills by engaging their children in discussions that encourage logical thinking.

For example, parents can create everyday opportunities to challenge their children with problems that require thoughtful solutions. By introducing tasks that involve simple math concepts, like figuring out how much more change they should receive after a purchase, or asking questions like, "How can we divide this pizza equally?", parents can prompt their children to think critically. These tasks encourage children to analyse the problem, explore different strategies, and determine the most appropriate solution.

Syyeda (2016) explains that when children recognize the real-world importance of mathematics, they are more likely to become motivated to study and practice the subject. This sense of relevance is crucial in developing critical thinking and problem-solving abilities. By demonstrating how math is used in everyday life, parents help children see that mathematics is not just a set of abstract concepts but a practical skill that can be applied to solve real problems.

The problem-solving process encourages children to be creative and persistent when faced with challenges. Through critical thinking, children learn to break down complex problems into manageable steps, evaluate potential solutions, and reflect on the effectiveness of their choices. These are essential skills that not only support mathematical learning but also contribute to success in other areas of life.

Critical thinking and problem-solving are foundational skills in mathematics that can be developed through everyday interactions between parents and children. By engaging children in thoughtful conversations, presenting problems that require logical reasoning, and demonstrating the real-world applications of mathematics, parents can significantly contribute to their children's development as critical thinkers and problem solvers. This support helps children approach math confidently and equips them with skills that will serve them well academically and personally.

2.3.2.7 Parent-Teacher Collaboration

Parent-teacher collaboration plays a crucial role in supporting children's mathematical development. Jaiswal and Choudhuri (2017) emphasize that parental involvement in children's education, particularly mathematics, is essential for creating a supportive and nurturing learning environment. This collaboration between parents and teachers fosters positive attitudes toward learning and practical applications that help children understand the relevance and importance of mathematics in their daily lives. When parents and teachers work together, children benefit from a holistic approach to learning that is consistent at home and school.

Parents have an important role in encouraging their children's appreciation for mathematics, as highlighted by Orell and Pihlaja (2020) and Puccioni, Froiland, and Moeyaert (2020). Parents who engage in conversations about math, provide real-life

examples and show interest in their child's progress help children develop a positive attitude toward the subject. When children see their parents value mathematics, they are more likely to adopt a similar mindset and develop a deeper appreciation for learning.

Collaboration between parents and teachers is key to ensuring the learning process is effective and meaningful. This partnership allows for the exchange of knowledge and ideas and reflection on practices and strategies. Teachers can provide parents with insights into the child's progress, while parents can share their perspectives on the child's experiences at home. Parents and teachers can develop strategies to address challenges, reinforce learning, and promote a positive learning environment.

In the context of parent-teacher collaboration, teamwork is essential. The effort put into this partnership is based on the principles of teamwork, equality, trust, respect, and a shared commitment to student success. When parents and teachers work as a team, they create a more muscular support system for the child, which increases the chances of academic success. Mutual respect and trust are fundamental in this collaboration, as they ensure that both parents and teachers feel valued and understood in their roles.

When parents feel comfortable, confident, and interested in mathematics, these emotions are passed on to their children. This positive mindset can significantly impact the parent-child relationship, especially when engaging in learning activities at home. Parents who show interest in math and enthusiastically approach it help their children develop a similar attitude. This, in turn, fosters a more engaging and productive learning experience at home, which is essential for reinforcing the concepts children learn at school.

Effective parent-teacher collaboration is vital for the development of children's mathematical skills. By working together, parents and teachers create a supportive environment where children can thrive academically. The partnership strengthens the learning experience, encourages positive attitudes, and ensures that children see the relevance of mathematics in their everyday lives. When parents feel confident and engaged in their child's education, it enhances the overall learning experience, benefiting both the child and the broader educational community.

2.3.3. IMPACT OF PARENTAL INVOLVEMENT IN DEVELOPING LEARNERS' MATHEMATICAL SKILLS

Parental involvement plays a crucial role in the development of children's mathematical skills. Numerous studies have indicated that when parents actively engage in their children's mathematical learning, it positively impacts their academic achievement and overall mathematical proficiency.

2.3.3.1 Early exposure and interest

According to Kennedy (2019), parents who expose their children to mathematical concepts from an early age contribute to the development of a positive attitude toward mathematics. Activities such as counting objects, playing number games, and solving simple problems at home can help foster an early interest in mathematics. (Clements & Sarama, 2015; Nguyen, Watts, Duncan, Clements, Sarama, Wolfe & Spitler, 2016.) show that early mathematics achievement is the strongest predictor of children's mathematics achievement in later school life.

Kennedy (2019) believed that getting involved as early as possible is the best way to prevent long-lasting negative attitudes towards Mathematics. Early mathematical proficiency is positively correlated with children's success in school and mathematics later on, according to a number of studies (Clements & Sarama, 2015; Watts, Duncan, Siegler & Davis-Kean, 2014). New research highlights the favourable relationship between young children's spatial abilities and their understanding of mathematics (Rittle-Johnson, Zippert & Boice, 2019).

Early mathematical competencies remain the strongest predictors of later reading and math achievements. Understanding numbers and operations is a particularly important educational objective in the early years since it can predict later success in mathematics and mathematics difficulties (Garon-Carrier, 2018). A plethora of research indicates that early exposure to mathematics enhances children's learning and subsequent accomplishment in numerous domains, particularly mathematics (Bailey, Siegler & Geary, 2014; Purpura, Schmitt & Storksen, 2022; Watts et al., 2014).

2.3.3.2 Home Learning Environment

The home learning environment plays a significant role in the academic development of children, especially in areas such as mathematics. Schapira and Aram (2020) state that a supportive home environment that values learning and fosters educational discussions can greatly enhance a child's mathematical abilities. This includes providing access to various learning resources, such as math-related books, puzzles, games, and tools that stimulate curiosity and problem-solving skills. When children are exposed to a rich and engaging home learning environment, they are more likely to develop strong mathematical skills and a positive attitude toward the subject.

The Home Mathematics Environment (HME) concept is multifaceted and encompasses several key elements influencing a child's mathematical development. First, parents' values, attitudes, and beliefs about mathematics play a crucial role in shaping a child's approach to the subject. Parents who demonstrate a positive attitude toward mathematics and value its importance in everyday life can instill similar attitudes in their children. For example, when parents speak positively about mathematics and view it as an essential part of daily life, children are more likely to approach math with confidence and curiosity.

The knowledge and experience that parents bring to their children's learning experiences also affect the home learning environment. Parents with a strong understanding of mathematical concepts or willing to learn alongside their children can provide valuable support. This engagement helps children feel more confident in their ability to tackle mathematical challenges. Even if parents are not experts in mathematics, their willingness to show interest, ask questions, and engage in problem-solving activities with their children can foster a positive learning environment.

The availability of resources is another critical component of the Home Mathematics Environment. These resources can include books, educational toys, games, and even technology such as apps or websites designed to teach mathematical concepts. When parents ensure that such resources are easily accessible, children have more opportunities to explore and engage with mathematics outside the classroom setting. These resources serve as tools for hands-on learning, allowing children to develop a deeper understanding of mathematical concepts through play and exploration.

Therefore, the Home Mathematics Environment (HME) is a dynamic and important aspect of a child's mathematical development. It includes the resources available at home and the attitudes, beliefs, and engagement of parents in supporting their children's learning. A positive and supportive home learning environment that encourages mathematical discussions provides access to educational tools and demonstrates the value of mathematics, which can significantly enhance a child's ability to succeed in the subject. Parents can create an environment that nurtures curiosity, confidence, and a love for mathematics by actively participating in their children's learning.

2.3.3.3 Real-Life Application

Real-life applications of mathematics play an essential role in helping children understand the importance and practicality of the subject. According to Elliott and Bachman (2018), parents have a significant opportunity to help children see how mathematical concepts are used in everyday life. By involving children in activities that require mathematical thinking, such as cooking, shopping, measuring, or even organizing household chores, parents can help children understand that math is not just something learned in the classroom but a valuable tool for solving real-world problems.

For example, when parents ask children to help measure ingredients for a recipe, they teach them about measurements and fractions, proportions, and problem-solving. Shopping trips also provide opportunities for children to learn about budgeting, addition, subtraction, and the concept of value. These everyday activities make math tangible and relatable, which can increase children's interest in the subject and help them understand its relevance to their daily lives.

Parents' attitudes towards mathematics can significantly influence how children perceive and engage with the subject. As Elliott and Bachman (2018) note, parents' beliefs about mathematics learning may shape how they teach math at home. For example, if parents view mathematics as a fun and engaging subject, they are more likely to present math activities in a positive light, making it enjoyable for their children. On the other hand, if parents view math as difficult or unnecessary, this attitude may

be transferred to their children, making them less confident or enthusiastic about learning math.

The actions and practices that parents implement at home, therefore, have a direct impact on how children approach math. Parents can foster a positive attitude toward mathematics by incorporating it into everyday activities and framing it as a fun and useful tool. By using informal, non-academic settings to engage children in mathematical thinking, parents create opportunities for children to learn without the pressure of formal instruction. For instance, parents might encourage their children to play math-related games or use math apps that make learning more interactive and enjoyable.

Parents can use a variety of tactics to achieve specific objectives for their children's early mathematical education. For example, to build number sense, parents may focus on counting objects during grocery shopping or using dice and board games to practice addition and subtraction. Parents can involve their children in organizing the family schedule or deciding the best way to divide tasks among family members to enhance problem-solving skills. These everyday strategies help children develop mathematical skills and provide them with a deeper understanding of how mathematics applies to the world around them.

Real-life applications of mathematics are essential in helping children see the value of the subject and understand how it is used in everyday situations. Parents play a crucial role in making these connections by involving their children in practical activities and demonstrating that math is both relevant and fun. When parents present math in a positive light and engage their children in real-life mathematical thinking, they improve their children's mathematical skills and foster a lifelong appreciation for the subject.

2.3.3.4 Homework Support

Homework support from parents is essential in reinforcing what children learn in the classroom, particularly in subjects like mathematics. According to Bartley and Ingram (2018), when parents assist with homework, they help reinforce mathematical concepts and practices learned in school. This support can take many forms, including

explaining mathematical concepts, providing problem-solving strategies, and reminding children of the importance of accuracy and comprehension in their assignments. By being actively involved in their children's homework, parents ensure that their children complete their tasks and understand the reasoning behind the concepts they are working on.

Parental support with homework is particularly important in mathematics, a subject that often requires practice and understanding of complex concepts. Children who receive consistent support from their parents while working on math homework tend to develop better problem-solving skills and a deeper understanding of mathematical principles. Bartley and Ingram (2018) suggest that children with strong confidence in their mathematical abilities often have parents who model a positive and enthusiastic attitude toward math, even if their experiences with the subject were less favourable. These parents show their children that mathematics is an engaging and essential subject, thus reinforcing their children's self-belief and interest in learning.

However, while the positive impact of homework support is well-established, the nature of parental involvement can change as children grow older, particularly during adolescence. Research by Silinskis and Kikas (2019a, 2019b) indicates that when children struggle with mathematics in their teenage years, parents often become less involved in their homework. This lack of involvement may arise from frustration, uncertainty, or an inability to assist with more advanced concepts. As children face more complex mathematical problems, parents may feel ill-equipped to provide adequate support, decreasing their engagement with homework.

Another factor affecting parents' involvement in math homework is the anxiety many parents experience toward mathematics. According to DiStefano et al. (2020), parents who have their own math-related anxieties are less likely to engage positively with their children's homework. This anxiety can result in harmful interactions between parents and children, which may hinder the child's motivation and confidence in the subject. When parents feel stressed or frustrated by mathematics, this may be reflected in their approach to helping with homework, leading to a less supportive and productive environment for learning.

Despite these challenges, it is vital for parents to be involved in their children's math homework as much as possible. Even if parents are not experts in mathematics, showing a willingness to help, asking questions, and encouraging their children to approach problems thoughtfully can significantly impact the child's learning experience. Parents can also help by fostering a growth mindset, emphasizing the importance of persistence and effort in overcoming complex math problems.

Parental support during homework time is key to helping children succeed in mathematics. When parents aid with math homework, they reinforce classroom learning, build their children's problem-solving skills, and encourage a positive attitude toward mathematics. However, parental involvement may decrease as children face more challenging math tasks, especially if parents experience math anxiety. Despite these obstacles, it is crucial for parents to remain engaged in their children's education and create a supportive environment that encourages learning and development in mathematics.

2.3.3.5 Communication with Teachers

Effective communication between parents and teachers supports children's mathematical development. According to Goodall (2021), maintaining an open line of communication with teachers allows parents to stay well-informed about their child's progress in mathematics. This collaboration gives parents valuable insights into their child's academic performance, including their strengths and weaknesses. By understanding these areas, parents can offer targeted and tailored support at home, ensuring their children's mathematical needs are addressed.

Goodall (2021) also emphasizes that regular communication with teachers helps parents keep track of their child's academic journey, allowing for timely interventions when necessary. For instance, if a child struggles with a mathematical concept, parents can work with teachers to identify specific strategies or resources that may help improve their understanding. This ongoing dialogue ensures that parents and teachers are aligned in supporting the child's learning, creating a cohesive and consistent approach to their academic growth.

Epstein (2018) expands on parental involvement in children's mathematical development, highlighting that it goes beyond merely assisting with homework. According to Epstein, parental involvement includes creating a positive and nurturing environment at home that fosters a love for mathematics. Parents can achieve this by incorporating real-life math applications, such as involving children in activities like shopping, cooking, or measuring, where mathematical concepts are naturally integrated. Such activities make math feel relevant and enjoyable, encouraging children to see the practical value of the subject in their daily lives.

Maintaining collaboration with teachers is also essential. Epstein (2018) suggests that when parents work with teachers, they contribute to a comprehensive approach to mathematical development. Teachers can offer insights into the child's classroom performance, while parents can provide feedback about how the child learns and engages with math at home. This partnership ensures that the school and the home environment work together to create a positive and supportive atmosphere for learning.

Epstein (2018) asserts that parents who know their children better than anyone else are in the best position to hone their children's mathematical skills. By staying informed through communication with teachers, parents can apply strategies at home that reinforce what children are learning at school. This personalized support, guided by the teacher's input, helps children build a strong foundation in mathematics, which is crucial for their educational success.

Communication between parents and teachers is vital for effectively developing children's mathematical skills. Open dialogue allows parents to understand their child's academic progress and provides them with the tools to offer targeted support at home. This collaboration goes beyond homework help, encompassing the creation of a supportive learning environment at home and the integration of real-life applications of mathematics. By working together, parents and teachers can ensure children develop a strong and positive relationship with mathematics, setting them up for academic success.

2.3.3.6 Encourage Positive Attitude Towards Mathematics

Parental involvement is a critical factor in shaping children's learning outcomes in mathematics, potentially influencing their attitudes toward the subject positively and negatively. According to Ajisuksmo & Saputri (2017), how parents engage with their children regarding mathematics can significantly impact their academic performance. Some forms of involvement, such as active encouragement and support, are known to improve children's learning outcomes, while other types may have the opposite effect, hindering their progress. This highlights the importance of positive and purposeful parental involvement in fostering a productive learning environment.

Karjanto (2017) further emphasizes that parents must learn to communicate effectively with their children about mathematics. Instead of viewing mathematics as a daunting or challenging subject, parents can introduce fun and engaging activities, such as math-related games, which stimulate children's interest and improve their mathematical skills. These activities promote learning and contribute to a more positive attitude towards the subject, making it enjoyable and approachable. Children who find joy in mathematical tasks are more likely to actively participate in learning and experience higher achievement and success in mathematics.

Developing a positive attitude towards mathematics is considered an important educational outcome. Langat (2015) points out that a child's attitude towards mathematics strongly influences their behaviour and academic performance. While attitudes are not directly observable, they are inferred from observable actions and responses. For instance, a child who consistently engages with mathematical tasks approaches them confidently and enjoys solving problems likely has a positive attitude towards mathematics. This attitude plays a significant role in shaping a child's motivation to learn and persevere in mathematics, contributing to their overall success.

Parental involvement at home is crucial in fostering a positive attitude towards mathematics. According to Epstein (2018), the extent to which parents engage with their children in mathematical activities significantly influences various aspects of their learning, including their general attitude toward the subject, cognitive development, mathematics skills, academic performance, and numeracy knowledge. When parents

are actively involved in their child's mathematics education, they can reinforce positive attitudes and help children view mathematics as an important and enjoyable subject.

Lara and Saracostti (2019) also emphasize the vital role of parental involvement in children's academic outcomes, particularly in mathematics. Parents can enhance their child's performance and develop a strong foundation in mathematics by offering support, encouragement, and appropriate learning activities at home. When children experience positive reinforcement from their parents, they are more likely to adopt a growth mindset, where they believe that their abilities in mathematics can improve with effort and practice.

Parents play a pivotal role in encouraging a positive attitude towards mathematics in their children. Through effective communication, engaging activities, and consistent support, parents can help children develop a love for the subject and foster a growth-oriented mindset. Positive parental involvement in mathematics education improves academic performance and shapes a child's overall attitude toward learning, contributing to long-term success and a positive relationship with mathematics.

2.3.3.7 Play Mathematics Games

Play is an essential part of young children's learning, and it provides a natural and enjoyable way for them to develop various skills, including mathematical abilities. According to Chuang (2021), young children learn best through play, allowing them to explore, experiment, and understand the world around them in a hands-on, engaging manner. For this reason, it is essential for parents to introduce mathematical games that not only capture children's interest but also help them enhance their mathematical skills. These games should be designed to be both fun and educational, fostering a positive relationship between children and mathematics.

Mathematical games for young children often involve simple activities incorporating basic mathematical concepts. For example, parents can encourage children to build towers using blocks, a game that helps develop an understanding of size, shape, and counting. Another activity could involve matching pictures of animals with the correct numbers, reinforcing number recognition, counting, and the concept of one-to-one correspondence. These activities provide a playful way to practice mathematical skills

and promote problem-solving and critical thinking as children engage with the tasks at hand.

Young children's play frequently involves concepts and ideas foundational to mathematics. As they engage in various forms of play, children naturally explore mathematical ideas such as quantity, measurement, patterns, and shapes. For example, when children play with blocks or puzzles, they might intuitively develop an understanding of spatial relationships and geometric shapes. Games that involve sorting, counting, or sequencing help children understand the basics of arithmetic and number sense. According to Perry and Dockett (2013), a wide range of mathematical experiences and concepts are embedded in early childhood environments, particularly in the context of play. These experiences lay the groundwork for more formal mathematical learning in the later years.

Incorporating mathematics into play cannot be overstated, as it allows young children to interact with mathematical ideas meaningfully. When parents create opportunities for play that include mathematical elements, they support the development of children's mathematical thinking in a relaxed, enjoyable setting. Through these playful interactions, children are not only learning basic mathematical concepts but are also developing a positive attitude towards the subject, which is crucial for fostering long-term engagement and success in mathematics.

Playing mathematics games is an effective way to enhance young children's mathematical skills. When designed to be fun and interactive, these games provide children with valuable opportunities to explore and understand mathematical concepts in an informal yet meaningful way. By engaging children in mathematical play, parents contribute to developing their mathematical abilities, helping them build a strong foundation for future learning.

2.3.3.8 Support Homework

According to Bartley and Ingram (2018), homework is considered a major means of connecting learning processes at school with the home/family sphere. Parents who support their children with homework, their children's performance is good, unlike the

ones who do not support their children. When children feel supported by their parents, they strive to excel in their performances. Parents need to be there for their children if they want them to outshine their school work. They must help them understand the directions, be available to answer simple questions, or praise and acknowledge their effort and hard work (Epstein ,2018).

In many families, parents, and children may regularly engage in formal and informal math activities (e.g., games and flashcards) at home. Research on such activities has been guided by cognitive models in which parents' development of children's mathematical skills in the years before children enter elementary school is considered fundamental to children's mathematic learning (Skwarchuk et al., 2014). In this vein, there has been much attention to the types of activities in which parents and children engage relevant to the development of mathematical skills during these early years of children's lives (McCormick, Weissman, Weiland, Hsueh, Sachs & Snow, 2020; Skwarchuk et al., 2014).

2.4.1. STRATEGIES THAT CAN BE USED IN HELPING CHILDREN IN ACQUIRING MATHEMATICAL SKILLS

Parents play a crucial role in fostering their children's mathematical skills. Here are some effective strategies:

2.4.1.1. Strategies That Can Be Used in Helping Children in Acquiring Mathematical Skills.

Mathematics is a fundamental subject that is crucial to children's cognitive development and academic success. Acquiring strong mathematical skills lays the foundation for future learning and problem-solving abilities. To ensure that children develop these skills effectively, it is essential to implement various strategies that can engage, motivate, and support them throughout their learning journey. These strategies should be tailored to address children's individual needs, providing opportunities for hands-on learning, practice, and application of mathematical concepts in real-life contexts. This section explores various methods that parents, teachers, and caregivers can use to facilitate the acquisition of mathematical skills, emphasizing creating an enriching and supportive learning environment both inside

and outside the classroom. By incorporating these strategies, children can build a solid mathematical foundation that will benefit them in their academic and everyday lives.

2.4.1.1 Start Early

Starting early is a crucial strategy for helping children acquire mathematical skills, as early exposure to math-related activities significantly influences their understanding of mathematics later in life. Everyday activities such as counting objects, identifying shapes, discussing sizes, and engaging in mathematical conversations lay the groundwork for early numeracy development. For instance, simple activities like singing number songs, sorting toys by size or colour, and discussing quantities during daily routines can boost children's mathematical abilities playfully and engagingly. These informal interactions between parents and children create a positive environment for mathematical learning.

Research has shown that children exposed to math-related language from a young age, such as counting or discussing shapes and sizes, develop a stronger understanding of mathematical concepts when they reach preschool. Parents can help children become more comfortable with mathematical ideas and language by incorporating these math-rich interactions into everyday life. Recognizing and capitalizing on these "mathematics moments" throughout the day, whether cooking, shopping, or playing, provides children with meaningful opportunities to apply mathematical thinking.

It is essential for parents to understand that math is not confined to the classroom. It is present in many daily activities and children's natural interests. For example, building with blocks, setting the table, or measuring ingredients during cooking all involve mathematical concepts. Parents do not need to make drastic changes to their routines but can enhance their interactions by naturally integrating math. This approach ensures that math becomes a part of children's everyday lives and helps them develop an early familiarity with math that can lead to stronger mathematical skills as they grow older.

Studies have shown that a child's early math skills better predict future academic success, even more so than early reading abilities (Duncan, 2017). Early mathematical learning lays the foundation for later cognitive development, problem-solving, and academic achievement, highlighting the importance of beginning math instruction as early as possible. Therefore, starting early with math-focused activities supports children's current learning and fosters long-term academic success.

2.4.1.2 Make Mathematics Fun

Making mathematics fun is an essential strategy for helping children acquire mathematical skills, as it fosters engagement and enthusiasm for learning. When children participate in fantasy or imaginative play, they naturally create and explore scenarios that allow them to visualize and represent mathematical concepts such as shapes, patterns, and spatial relationships. Fantasy play encourages children to think creatively and use their imagination, strengthening their problem-solving abilities, a critical aspect of learning mathematics.

For example, when children play pretend play, such as setting up a pretend store, they often engage in activities like counting, sorting, and organizing items. These activities allow children to practice counting, adding, and subtracting in a meaningful and enjoyable context. Children may explore spatial concepts through games that involve arranging objects, identifying shapes, or understanding their positions relative to one another. These playful activities help children grasp basic math concepts and develop mathematical thinking in a natural, low-pressure setting.

Fantasy plays also allow children to engage with abstract mathematical ideas. For instance, children might pretend to measure ingredients for a recipe or organize a group of toys based on different characteristics. These activities require them to apply concepts such as quantity, size, and arrangement, and help them develop an understanding of these concepts they will build upon as they progress in their mathematical learning. In this way, the context of play can be concrete and abstract, providing children with a rich environment to practice and reinforce their math skills.

Research by George and Freeman (2017) emphasizes that much of children's spontaneous play incorporates mathematical thinking. Whether it is constructing with blocks, playing with puzzles, or organizing objects in patterns, children constantly interact with mathematical concepts in their everyday play. By making math a fun and enjoyable part of these activities, parents and educators can help children build a strong foundation in mathematics that supports their academic growth and enthusiasm for the subject. When mathematics is presented as an enjoyable and integral part of daily life, children are more likely to develop positive attitudes toward learning math and continue to explore it as they grow.

2.4.1.3 Use of Visual Aids

Visual aids play a significant role in supporting children's mathematical understanding and enhancing their problem-solving abilities. According to Barmby, Boyden, Raine, and Thompson (2017), visual aids help children develop a deeper understanding of the concepts they are learning by clearly representing the problem at hand. When learning mathematics, children often create mental images or "visual models" to help make sense of abstract ideas. These models can range from simple tools, such as using cake slices to represent fractions, to more complex representations of mathematical concepts. The use of such visual aids makes abstract ideas more tangible, allowing children to grasp mathematical concepts more concretely.

Numerous researchers highlighted the effectiveness of visual aids in mathematics education. Raiyan (2016) and Van Garderen, Scheuermann, Poch, and Murray (2018) support the view that visual aids are essential for fostering understanding in children and enhancing their ability to solve mathematical problems. For example, visual tools can help children break down complex mathematical problems into smaller, more manageable parts, facilitating their understanding.

Barmby, Boyden, Raine, and Thompson (2017) emphasized that visual aids promote children's mathematical development when parents use them at home. Parents can utilize everyday objects, like measuring cups or colored blocks, to visually demonstrate mathematical concepts. This use of visual aids not only improves the children's ability

to learn math but also engages them in the process by making it more interactive and enjoyable. This increased engagement can boost children's interest in mathematics and contribute to their long-term mathematical success.

Visual aids are essential in learning as they provide children with explicit, tangible representations of abstract mathematical concepts. The use of visual aids not only helps children improve their problem-solving skills but also strengthens their overall understanding of mathematics. Visual aids can foster greater interest in the subject, making learning more enjoyable and effective.

2.4.1.4 Promoting Mathematics learning in young children

According to The Progress of Education Reform (2017), the early years of a child are what set the foundation for what their later stages in school will look like; for example, if the foundation for mathematics that is laid is weak, then they are most likely to struggle at a later stage. Young children can understand complicated math (The Progress of Education Reform, 2017). Children in preschool who receive good mathematics instruction early can build on these core skills with significant mathematical learning throughout their primary years (The Progress of Education Reform, 2017). The young children's math skills can be developed or enhanced by counting concrete objects they come across and matching the objects with their numbers as they count. Through this method, the counting abilities or skills of young children are developed. Also, their mathematics skills are being built up for future and formal math learning.

Harris and Petersen (2017) believe that Preschooler's math competence affects how well they do in high school. Most interestingly, it predicts reading performance substantially better than early reading abilities. More mathematics practice improves conversational language skills. According to studies, children's ability to solve problems and think critically is aided by mathematics (The Progress of Education Reform, 2017; Harris & Petersen, 2017). For children to succeed in school and life, it is important to develop their problem-solving and critical-thinking skills, but not all kids develop the requisite math skills (Mullis, Martin, Foy, and Hooper, 2016; Harris & Petersen, 2017). for real. The most important part of developing mathematical skills in

children is reasoning. The ability to reason mathematically is a crucial cognitive ability, and children's proficiency in mathematics from a young age indicates how successful they will be at mathematics as adults.

2.4.1.5 Do Not Downplay Children's Math Ability

It is essential not to underestimate or dismiss the mathematical abilities of young children, as their cognitive capabilities in mathematics can be far more advanced than commonly perceived. According to Baroody (2017), children intuitively understand arithmetic, which they develop naturally through everyday activities and experiences at home. This informal learning allows young children to build a deep, extensive, and advanced grasp of mathematical concepts, even before they are formally taught. When given opportunities to engage with mathematical ideas, children show a remarkable ability to understand and solve problems, indicating they possess significant mathematical aptitude.

Parents and caregivers play a crucial role in nurturing this early mathematical ability by providing various learning opportunities. Encouraging children to participate in educational games, puzzles, and toys that promote mathematical thinking can be especially beneficial. These activities allow children to explore mathematical concepts in a fun, engaging way while reinforcing their learning. Research by Sarama and Clements (2017) and The Progress of Education Reform (2017) highlight that preschoolers often engage in pre-mathematical activities during their playtime, such as counting, sorting, or recognizing patterns. This early engagement with math helps children develop essential skills such as number recognition, spatial awareness, and basic problem-solving.

Even simple actions, such as counting fingers and toes, allow young children to practice mathematical concepts in a natural setting. These everyday activities contribute to children's ability to understand numbers and their relationships, reinforcing their mathematical foundation. The more opportunities children must engage with mathematical ideas, the stronger their understanding and abilities become.

Young children possess a natural and advanced understanding of mathematics that should be nurtured rather than dismissed. Parents can help children develop their mathematical skills early by providing various activities and objects to encourage mathematical exploration. Ensuring preconceived notions about their mathematical abilities do not limit children is crucial for fostering a positive relationship with math and setting the stage for future academic success.

2.4.1.6 Play as a means of teaching young children math

Karakus and Akman (2017) mention that even though most early childhood educators do not see the importance of play as a method of effective teaching, they do not include it in their programs, and play is important when teaching math to young children. Higher-level free play, which aids kids with self-control and executive function, has increased in early childhood programs with more Math. Children investigate spatial relationships, patterns, and shapes through higher-order play. They count the items and compare sizes (The Progress of Education Reform, 2017). These game-based investigations have a previous mathematical relationship. All children can use their innate mathematical ability with excellent instruction. Even before they can sit up, infants begin to learn math. They use fundamental mathematical concepts while playing and in other aspects of their daily lives to differentiate between variations in quantity, compare the size and shape of objects, and analyse variations in quantity (Harris and Petersen, 2017).

Most children are stuck on a path to failure if excellent mathematics instruction does not begin in preschool and continues throughout the early years. Since early mathematics development is essential for success in the future, it is imperative to have pedagogical tools that encourage mathematics learning from the earliest ages. One way that playful learning, a thorough pedagogical technique incorporating games, free play, and guided play, supports early mathematics acquisition is by providing a productive, research-based teaching approach (Hassinger-Das, Zosh, Hirsh-Pasek & Golinkoff, 2018).

2.4.1.7 Do Not Undervalue Children's Prior Knowledge

One critical aspect of supporting children's learning, particularly in mathematics, is recognizing and valuing their prior knowledge. According to Clements and Sarama (2017), many teachers of young children tend to vastly underestimate what children already know and their ability to learn. This underestimation can negatively impact how teachers approach the teaching process, often leading to missed opportunities for building on the children's existing understanding. This tendency to undervalue children's prior knowledge is not limited to teachers alone but extends to other adults involved in their education, such as counselors and teacher trainers. For example, a study by The Progress of Education Reform (2017) found that adults consistently underestimated the mathematical skills of preschool children when they entered kindergarten.

In this study, preschool teachers, teacher trainers, and counselors believed that only 20% to 50% of children could count, while over 80% of children could count out nine marbles accurately. This gap between adults' expectations and children's capabilities reveals how adults often misjudge children's readiness and abilities. In another comparison, fewer than 10% of the adults correctly predicted that children could subtract 10 from 8, but more than 40% could perform this subtraction independently, without any materials to aid them. This discrepancy highlights a crucial issue: adults often have limited faith in the capabilities of young learners, which can result in children receiving fewer challenging tasks than they can complete.

When teachers and parents fail to recognize the extent of children's existing knowledge, they may inadvertently hinder children's motivation and engagement. By failing to acknowledge and build upon the skills children already possess, they risk not providing enough encouragement or challenges to foster further growth. On the other hand, when educators and parents recognize and value children's prior knowledge, it can serve as a powerful motivator. Children are more likely to feel encouraged and motivated to engage in more complex learning tasks if they sense that their abilities are recognized and respected.

Thus, it is crucial for both teachers and parents to acknowledge that young children come with a wealth of knowledge and skills that can be built upon. Providing children

with opportunities to apply their prior knowledge in meaningful ways boosts their confidence and lays a strong foundation for continued learning and success in mathematics.

2.4.1.8 Tutoring in Math is Required for Young Children

The importance of early mathematical development cannot be overstated, as early math skills are strongly correlated with future academic success, particularly in reading and arithmetic. Harris and Petersen (2017) research suggested that early math ability is among the best predictors of later achievement in both academic areas. Children who develop strong mathematical foundations early are more likely to succeed in school, while those who struggle may face challenges that affect their long-term academic performance. Studies by Watts, Duncan, Siegler, and Davis-Kean (2014) and Hirsh-Pasek, Golinkoff, and McCandliss (2014) further emphasize that difficulties with math can emerge as early as a child's entry into kindergarten. If not addressed, these challenges can cause children to fall behind their peers in later years, creating a difficult gap to close.

However, the need for intervention is not limited to children from disadvantaged backgrounds. Even children from more advantaged backgrounds can struggle with math in their early years, and these difficulties can compound over time. Research by Hassinger-Das, Zosh, Hirsh-Pasek, and Golinkoff (2018) highlights that children who enter preschool with weak foundational math skills tend to stay behind their peers despite efforts to catch up. This underscores the importance of addressing math challenges early before they become entrenched.

One critical factor in addressing these early difficulties is tutoring or targeted intervention. Early math tutoring can help children develop strong mathematical foundations, which are essential for future academic success. Tutoring helps children build confidence in their math abilities, clarifies concepts they might find confusing, and provides a structured environment for learning. Through one-on-one tutoring or small group instruction, children can receive the focused attention they need to overcome challenges and stay on track with their peers.

Parents also play an essential role in shaping their children's mathematical skills, particularly during the Foundation Phase. Susperreguy and Davis-Kean (2018) noted that parents can contribute significantly to their children's math development by fostering a positive attitude toward math, integrating math activities into daily routines, supporting their children's formal education, and modeling problem-solving strategies. For instance, parents can use everyday situations such as cooking, shopping, or organizing to introduce basic mathematical concepts like counting, measurement, and pattern recognition. When parents are actively involved in their child's math learning, they can provide the reinforcement and encouragement needed to build a strong foundation for future mathematical success.

The combination of early intervention, tutoring, and active parental involvement ensures that all children, regardless of background, develop the mathematical skills necessary for success in school and beyond. Early math skills are crucial for arithmetic and play a foundational role in fostering critical thinking and problem-solving abilities, which are valuable throughout a child's educational journey.

2.4. CONCLUSION

This chapter has provided an in-depth review of the literature surrounding the development of mathematical skills in young children, focusing on the role of parents and the importance of early intervention. Research consistently highlights parents' critical role in shaping their children's mathematical abilities. Parental involvement, whether through communication with teachers, creating a positive learning environment at home, encouraging positive attitudes towards mathematics, or using visual aids, has been shown to enhance children's mathematical development significantly.

Literature also underscores the value of early exposure to mathematical concepts through everyday activities, such as counting, sorting, and engaging in games that involve mathematical thinking. Early play experiences, particularly those that involve fantasy or problem-solving, provide children with the foundational skills they need to understand more formal mathematical concepts later. Using visual aids, such as manipulatives and visual models, has been recognized as an effective strategy for helping children internalize mathematical ideas and improve problem-solving abilities.

It is equally important to avoid underestimating children's potential in mathematics. Many studies have demonstrated that young children often possess a much deeper understanding of mathematics than adults may initially recognize. Giving children opportunities to demonstrate their mathematical skills and offering appropriate challenges can foster confidence and competence.

Early intervention and tutoring are vital components for addressing children's math difficulties, especially those that emerge during preschool and kindergarten. These interventions, combined with active parental involvement and supportive learning environments, ensure children have the mathematical foundations necessary for future academic success.

The literature reveals that building a solid mathematical foundation for young children is not solely the responsibility of the school. Parents, caregivers, and educators all play interconnected roles in fostering the mathematical skills that children need. Through a combination of early learning strategies, positive reinforcement, and targeted interventions, children's mathematical abilities can be developed and nurtured, setting the stage for their future educational achievement and success.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presented the research methodology used to investigate parents' role in developing their children's mathematical skills in the Foundation Phase (Grade 1). The study employed qualitative methods to explore the experiences and perceptions of parents and teachers in the context of supporting children's early mathematical development. The research was framed within an interpretive paradigm, guided by a case study design to examine the complexities of parent involvement in developing mathematical skills. This chapter outlines the research paradigm, design, methodology, data collection, sampling procedures, data analysis, and ethical considerations, providing a detailed explanation of how the study was conducted.

3.2. Research Paradigm

Research paradigm describes framework or system of beliefs, values, and assumptions that guided researchers in their work. It provided a philosophical foundation for how research should be conducted, including the nature of reality (ontology), the nature of knowledge (epistemology), and the methods used to investigate phenomena (methodology). A research paradigm influences every aspect of the research process, from formulating the research question to interpreting findings (Kivunja & Kuyini, 2017).

The study was grounded in the interpretive research paradigm, which emphasizes understanding the meanings and perspectives of individuals in their natural social contexts. Interpretivism was particularly suited for qualitative research as it seeks to understand participants' subjective experiences and interpretations (Cohen et al., 2020). In the context of this study, the aim was to explore how parents understand and engage with their children's mathematical learning in Grade 1. This paradigm allows for an in-depth investigation of the social and cultural factors influencing parental

involvement in education, highlighting the importance of context in shaping how mathematical skills are developed at home.

Interpretivism challenges the notion of a single objective reality, instead suggesting that reality was constructed through the perceptions and experiences of individuals (Gray, 2021). This approach aligns with the study's focus on the subjective experiences of parents and teachers, as their personal insights provide a nuanced understanding of the role of parents in fostering mathematical skills in early childhood education.

What is interpretivism

Berryman (2019) states that the interpretivism research paradigm places emphasis on comprehending human behaviour from the viewpoint of the subjects of the study. The researcher concentrated on the subjective experiences and meanings parents assign to their activities and interactions with their children when applying interpretivism to the role of parents in helping their children develop their mathematics skills in Grade 1 (Aliyu, Bello, Kasim & Martin, 2014). Without imposing preexisting notions, this approach aims to investigate the intricacies of the parent-child connection in the context of developing mathematical skills.

Rather than how often something appears or behaves, what makes an object real was its quality. Even if an object undergoes several colour or behaviour changes, it was still the same object being understood differently. As a result, once an object was measured, objectivists would quickly assign it a permanent tag, while interpretivists would describe the object as it was when it was observed in its natural habitat. Thus, reality was not permanent in this setting.

The techniques used by interpretivists allow them to produce qualitative data. While numerical data were produced during the procedure, it was not dependable. In qualitative research, the goal of numerical data was not to draw inferences or conclusions. In any case, qualitative data were characterized and intended to add rigor to the comprehension of the phenomenon being studied.

Generally, the researcher employed qualitative techniques like interviews while utilizing an interpretive paradigm. Parents were able to share their ideas, opinions,

and practices regarding their children's mathematics education with the researcher in natural settings. The aim was to find the underlying motives and meanings that direct parents in assisting their kids' mathematics development.

This study paradigm focused on comprehending the various ways parents view their duties, their tactics, and the difficulties they encounter when trying to support their kids' mathematical development. The researcher used an interpretive lens to try and capture the variety of parental viewpoints and the dynamic character of the math learning process between parents and children in Grade 1 at Mvudi Circuit in the Vhembe East District. This method acknowledges the significance of personal experiences and context in influencing the complex dynamics of parent-child relationships with the development of mathematical skills.

3.3 Research Design

Research design refers to the plan and structure of the research process, outlining the procedures for collecting, analyzing, and interpreting data. It serves as a roadmap for the study, helping the researcher address the research questions while ensuring that the methodology aligns with the study's objectives. A well-constructed research design ensures that the study is conducted systematically and rigorously, providing valid and reliable results (Creswell & Poth, 2020).

The research design employed in this study was qualitative in nature, as it seeks to understand the complexities of parental involvement in the development of mathematical skills in the Foundation Phase. Qualitative research focuses on exploring phenomena in their natural settings and provides in-depth insights into how people experience and interpret their world. Unlike quantitative research, which relies on numerical data and statistical analysis, qualitative research aims to understand participants' underlying meanings, experiences, and perceptions (Creswell & Poth, 2020; Denzin & Lincoln, 2018).

This approach was particularly valuable when the goal is to gain an understanding of how individuals perceive and make sense of their world. This study focuses on understanding how parents contribute to their children's mathematical development in the Foundation Phase. The role of parents was multifaceted, involving a range of

behaviors, attitudes, and actions that influence children's learning. These factors are not easily captured through numerical data alone but require an exploration of the lived experiences of parents and their interactions with their children.

Qualitative research allows for a deeper exploration of these complexities by gathering detailed data through methods such as interviews, observations, and documentation. Interviews allow parents to share their perspectives in their own words or mother tongue which is Tshivenda, while observations offer insights into how parents engage with their children during everyday activities. Additionally, documentation, such as notes or recordings, can further enrich the data collection process by providing a record of the interactions and practices that influence mathematical development.

Using a qualitative approach, this study captured the nuances of parental involvement and its impact on children's mathematical skills. The rich, descriptive data collected will offer a comprehensive understanding of the various ways parents support or hinder their children's learning. This approach allows for exploring what parents do and how they perceive their role in fostering mathematical development, which was essential for developing effective strategies for supporting children's learning in the Foundation Phase.

The qualitative research design in this study was well-suited to explore parents' intricate and subjective experiences and their involvement in children's mathematical learning. It enables the researcher to gather comprehensive, context-rich data, which was essential for understanding the multifaceted nature of parental involvement and its influence on early mathematical development (Patton, 2015).

3.4 Research Methodology

Research methodology refers to the systematic approach and underlying principles used by researchers to design, conduct, and analyze a study. It encompasses the strategies, techniques, and tools used to collect, analyze, and interpret data. Essentially, it is the blueprint for conducting a research project, ensuring the process is rigorous, reliable, and valid (Neuman, 2014).

The study utilised a case study methodology, a research strategy involving an in-depth exploration of a particular phenomenon within its real-life context (Yin, 2018). In this

case, the phenomenon under investigation was the parents' role in developing their children's mathematical skills in Grade 1. The case study approach allows for a detailed investigation of this specific educational context, considering the experiences of both parents and teachers within the same setting.

By focusing on a specific group of parents and teachers, the study aims to provide insights into the ways in which parental involvement influences children's early mathematical learning. The case study methodology was ideal for examining complex social phenomena, as it allows for exploring multiple perspectives and identifying patterns and themes that may not be apparent in more generalized research designs.

3.5 Data Collection

Data collection refers to the systematic process of gathering, measuring, and analyzing information to address research questions or hypotheses. It is a fundamental aspect of any research study, as the data's quality and accuracy directly influence the research findings' reliability and validity (Creswell & Poth, 2020). The methods used in data collection should align with the research design and the nature of the study to ensure comprehensive and accurate insights into the phenomenon being studied.

Semi-Structured Interviews: Interviews were conducted with parents and teachers to explore their perceptions of the role of parents in supporting mathematical learning. The semi-structured format allowed for flexibility in questioning while ensuring that key topics were covered (Bell et al., 2022). Interview guides were developed for both groups, with questions focusing on the strategies used to support children's learning, the challenges faced, and the perceived impact of parental involvement on children's mathematical skills.

Classroom Observations: Observations were conducted in Grade 1 classrooms to examine the types of mathematical activities and interactions that occurred during lessons. This method provided additional context for understanding how parental involvement might translate into classroom practices (Hossain et al., 2024).

Document Analysis: Relevant documents, such as lesson plans and parental involvement materials, were analyzed to understand further the formal and informal

ways in which parents and teachers engage in the development of mathematical skills (Fife & Gossner, 2024).

3.6 Sampling

Population: The population for this study consisted of Grade 1 parents in a selected Foundation Phase school. This group was selected based on their direct involvement in the children's mathematical education.

Sampling Procedure (Purposive Sampling): Purposive sampling was employed to select participants who could provide rich, detailed information relevant to the research questions (Bell et al., 2022). This technique ensured that the study focused on individuals with specific knowledge or experience regarding the development of mathematical skills in Grade 1.

Sample: The sample consisted of 16 parents from each of the three selected. The total sample size of 16 participants allowed for rich, diverse insights into parental involvement. The parents were selected based on their involvement in supporting their children's mathematics learning at home. The small sample size was intentional to allow for an in-depth exploration of each participant's experiences.

3.7 Data Analysis

Thematic analysis was used to analyze the qualitative data collected from interviews, observations, and document analysis. Thematic analysis involves identifying, analyzing, and reporting patterns or themes within the data, providing a detailed understanding of the data set (Braun & Clarke, 2021).

Steps in Data Analysis:

1. **Familiarization with Data:** Transcripts of interviews, observation notes, and documents were reviewed multiple times to ensure a thorough understanding of the content.
2. **Initial Coding:** Initial codes were generated by highlighting key data pieces relevant to the research questions (Fife & Gossner, 2024).

3. **Theme Development:** The codes were grouped into potential themes that reflected common patterns in the data. These themes were then refined to ensure they accurately represented the data.
4. **Analysis and Interpretation:** The themes were analyzed in relation to the research questions, and the findings were interpreted within the context of existing literature and theoretical frameworks.

3.8 Delimitation of Study

This study was delimited to a single school within a specific geographical area. Only Grade 1 parents and teachers from this school were included, limiting the findings' generalizability to other contexts or educational levels. The focus was solely on the role of parents in the development of mathematical skills, without considering other factors such as the role of siblings, extended family, or the broader community. These delimitations were necessary to focus the study on specific aspects of parental involvement in early childhood mathematics education.

3.9 Trustworthiness of the Study

Trustworthiness in qualitative research refers to the findings' credibility, transferability, dependability, and confirmability (Lincoln & Guba, 2018). In order to verify the data collected, Guba's model of trustworthiness (Mathebane, 2017) was utilised. The model consists of credibility, transferability, dependability, and confirmability. The approach assumes that qualitative research can be more credible as long as certain techniques, methods, and strategies were employed during the study (Mathebane, 2017). The researcher used triangulation to ensure trustworthiness by combining data from interviews and secondary sources. Member checking was also conducted by sharing preliminary findings with participants to validate the accuracy of the interpretations. The trustworthiness of the study was ensured through several strategies:

Credibility: The study used multiple data sources (interviews, observations, and document analysis) to triangulate findings and provide a comprehensive view of the research problem (Creswell & Poth, 2020).

Transferability: While the findings may not be directly transferable to other contexts, the detailed descriptions of the research setting, participants, and methodology allow for the potential to draw parallels with similar contexts (Lincoln & Guba, 2021).

Dependability: A clear and consistent research process was followed, with detailed records of the data collection and analysis procedures to ensure dependability (Fife & Gossner, 2024).

Confirmability: The findings were grounded in the data, and direct quotes from participants were used to support the analysis, ensuring that the conclusions reflected participants' views and experiences (Braun & Clarke, 2021).

3.10 Ethical Considerations

Informed Consent: All participants were informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without consequence. Written consent was obtained from both parents and teachers before participation (Gray, 2021).

Confidentiality: Participants' identities were kept confidential, and pseudonyms were used in the reporting of findings to ensure anonymity (Hossain et al., 2024).

Respect for Participants: The study was conducted with respect for participants' perspectives, ensuring their views were heard and accurately represented. Participants were encouraged to share their experiences openly, and the researcher maintained a non-judgmental stance throughout the study (Reyes et al., 2021).

Avoidance of Harm: Efforts were made to minimize potential harm to participants, ensuring that the research process did not cause distress or discomfort (Cohen et al., 2020).

3.11 Conclusion

Chapter 3 outlined the research methodology employed in this study, detailing the research paradigm, design, methodology, data collection methods, sampling procedures, data analysis techniques, and ethical considerations. This qualitative, interpretivist study utilized a case study approach to explore parents' role in developing

their children's mathematical skills in Grade 1. By using multiple data sources and ensuring the trustworthiness of the study, the research aimed to provide rich, meaningful insights into parental involvement in early mathematics education. The following chapters will present the findings, interpretations, and conclusions drawn from the research.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter presents the analysis and discussion of the findings derived from the research on parental involvement in assisting children with mathematics learning. The chapter was structured into four key thematic areas, each highlighting significant aspects of parental roles, challenges, and impacts on the mathematical development of learners. By examining these themes, the chapter aims to provide a comprehensive understanding of the various factors influencing parental engagement and its subsequent effect on children's mathematical outcomes. The findings were categorized based on recurring patterns observed during data collection involving interviews.

4.2 PRESENTATION AND ANALYSIS

In the following section, the researcher analyses data related to parental involvement in supporting children's mathematics learning. The themes address the challenges parents faced in assisting with mathematics, the extent of their involvement, the impact of their support on children's performance, and effective strategies to enhance their engagement. These findings offer valuable insights into how socioeconomic factors, parental confidence, and collaborative efforts can influence mathematical development in the home environment.

4.2.1 THEME 1: CHALLENGES FACED BY PARENTS IN ASSISTING WITH MATHEMATICS

Parental involvement in mathematics education is essential for fostering learners' academic success; however, many parents encounter significant challenges that limit their ability to provide effective support. This section explores key obstacles faced by parents, including lack of mathematical knowledge, time constraints, language barriers, socio-economic factors, and negative attitudes towards mathematics. Each of these factors influences the extent and nature of parental engagement, shaping both the academic outcomes and the learners' overall experience with mathematics. By understanding these challenges, schools and policymakers can develop targeted

interventions to enhance parental and bridge the support gap in mathematics learning at home.

4.2.1.1 Lack of Mathematical Knowledge

Many participants expressed difficulties in assisting their children with mathematical homework due to a limited understanding of the subjects. Parents mentioned that they often struggled with the methods taught in modern classrooms, which differed from the techniques they learned in school. **Parent B** stated:

“Sometimes my child comes home with work that I cannot understand. The way they teach these days is different, and I don’t know how to help.”

This response highlights a common challenge faced by parents with limited mathematical education. Research supports this difficulty, emphasizing that when parents lack confidence in their mathematical abilities, it can lead to minimal or ineffective engagement in their children’s education (Sheldon and Epstein, 2020).

Parents’ lack of mathematical knowledge limits their capacity to provide meaningful support during homework or school assignments. This gap not only hampers learners’ ability to grasp difficult concepts but also reduces parents’ willingness to engage in mathematical activities at home.

4.2.1.2 Language Barriers

Language differences were another significant challenge mentioned by participants. When parents speak a home language different from the language of instruction at school, helping with mathematics becomes even more difficult. **Parent E** noted:

“I speak Tshivenda at home, but the school teaches in English. Sometimes it’s hard to understand what they want, especially when it comes to word problem.”

This response illustrates how language barriers can hinder effective parental involvement. Research by Kim et al. (2019) supports this observation, suggesting that language barriers can limit parents’ ability to understand instructions, explain mathematical concepts, and communicate with teachers.

Language barriers complicate parents’ ability to assist with mathematics, especially when solving word problems or understanding complex instructions. Schools should

consider providing bilingual resources or workshops in the local language to bridge this gap.

4.2.1.3 Socio-Economic Factors influencing Parental Support

Several parents pointed out that financial difficulties prevented them from acquiring additional learning materials or enrolling their children in extra math lessons. **Parent H** explained:

“I would like to send my child for extra classes but cannot afford it. We only rely on what the teacher teaches at school.”

“Some parents said that they come from low-income families and that their circumstances compelled them to work long hours or multiple jobs, which left them with little time to devote to their children's education, such as offering extra practice in math or assistance with homework.”

This response highlights the role of socioeconomic status in shaping parental involvement. Studies have shown that socioeconomic factors greatly influence a parent's ability to provide supplementary educational support (Evans et al., 2021). Limited financial resources reduce access to tools such as private tutoring, educational apps, and learning manipulatives that could enhance mathematical understanding.

Socio-economic challenges restrict parents' ability to offer additional academic support, leading to reliance on schools as a primary source of education. Schools could mitigate this by offering free or low-cost tutoring programs and providing learners with take-home materials to practice mathematics.

4.1.2.4 Parents' Attitude and Confidence Levels Towards Mathematics

Participants also revealed that their own negative experiences with mathematics during their school years affected their confidence and willingness to engage in their children's learning. **Parent D** admitted:

“I was never good at mathematics in school. When my child asks for help, I feel nervous because I don't want to give them wrong answers.”

This response underscores how parents' attitudes towards mathematics influence their involvement. According to research by Maloney et al. (2019), Parents with negative attitudes toward mathematics often project anxiety onto their resulting in reduced confidence and interest in the subject.

Parents' negative attitudes and lack of confidence in mathematics create a barrier to effective involvement. This can impact the learner's perception of mathematics, potentially reducing their motivation and performance. Schools could address this by offering parent training sessions to boost confidence and equip parents with effective strategies for supporting their children.

4.2.1.5 Parents Mathematics anxiety

Since many parents find arithmetic difficult themselves, they may be reluctant to teach it to their children. It may be challenging for them to assist their children due to this lack of confidence successfully. Parents agreed that views about mathematics significantly influence future achievement and interest in formal mathematics. Research indicates that children develop their behaviours by taking others as models and observing other people's behaviors, including those of their parents, teachers, and friends (Soni & Kumari, 2017).

They also recognized that it was their personal duty to maintain optimistic attitudes and abstain from negative ones, such as mathematical fear. Again, several participants claimed mathematics is a challenging topic and that it is just for bright children, meaning they were of little use to their children. **Parent F** explained:

"I think it's a gender thing, I really do. I think that stereotyping starts before they are even born. I think a lot of boys will put across that they are better than girls at maths and things like that at a young age"

Like in the aforementioned quote, mothers and fathers discussed gender as a factor in children's mathematical learning. Mothers, in particular, have expressed concern in certain instances that they may be passing on their own arithmetic anxiety to their children.

4.2.1.6 Misconceptions about Early Mathematics

Many parents assume that mathematics ability is something a child is born with, and either they "have it" or they don't. Their own experiences with mathematics often reinforce this. This belief results in a fixed mindset in both the parent and the child, where struggles with mathematics are seen as a sign that the child is simply not "good at mathematics." Consequently, parents lower their expectations or disengage from helping their children, assuming that nothing can be done to improve their abilities. Studies highlighted that misconceptions stem from the early phase of learning, either in the classroom or as they interact socially with the world outside, (Li, Julihi, and Eng 2017).

Parents often believed mathematics primarily involves rote memorization of numbers, facts (like multiplication tables), and procedures. This view can lead to a focus on drilling children on arithmetic or formulas without fostering a deeper understanding of the concepts. Parents may overlook the importance of problem-solving, logical thinking, and conceptual understanding, which are crucial for long-term math success.

Many parents equate early math solely with counting or recognizing numbers, overlooking the broader aspects of math, such as patterns, spatial reasoning, and logical thinking. This narrow view of math can limit the types of math-related activities parents engage their children in. Parents may miss opportunities to support their child's mathematical thinking in everyday activities like playing with blocks, solving puzzles, or cooking.

Most parents believed that "real" mathematics learning only happens through formal lessons or worksheets and that informal activities such as playing games or cooking do not count as effective math learning. As a result, parents might miss out on engaging their children in meaningful math-related conversations or activities during daily routines, which are important opportunities for children to develop math concepts naturally and engagingly. **Parent A** stated:

"I believe that making mistakes in math is a sign of failure or lack of understanding."

This creates an environment where children are afraid to take risks or explore new strategies in problem-solving. Parents focus too much on getting the "right" answer, rather than encouraging their children to think critically, make mistakes, and learn from them.

The majority of parents who struggle with math anxiety think it's typical for their kids to feel the same way. Children of arithmetic-anxious parents frequently inherit their parents' unfavourable attitudes about Mathematics. This resulted in a vicious loop where children started to worry about themselves and lost faith in their Mathematical skills.

If parents think Mathematics is less important than English or believe it can be learned later, they may not provide sufficient support or engage their children in Mathematics activities during early childhood. Parents who think Mathematics ability is innate or tied to anxiety may be less motivated to help their children with mathematics, as they may feel that their involvement won't make a difference. Focusing too much on memorization and the right answers can create a stressful learning environment, which may reduce children's interest and enthusiasm for mathematics.

Parents are less able to successfully target their support when they lack clear information. This has an impact on the quality of their efforts as well as the level of involvement because they might not know how or when to assist, and their efforts might not be in line with what their child is learning in school.

4.2.2 THEME 2: EXTENT OF PARENTAL INVOLVEMENT IN DEVELOPING MATHEMATICAL SKILLS

The extent to which parents engage in their children's mathematics learning plays a crucial role in shaping their mathematical abilities and overall academic success. This section examines the frequency and nature of parental involvement, highlighting variations in engagement based on socio-economic and educational backgrounds. It further explores how different home learning environments contribute to the development of mathematical skills. While some parents actively participate in their

children's learning through regular homework assistance and the use of learning resources, others face limitations due to various socioeconomic constraints. Understanding these variations provides insight into the support systems learners receive at home and underscores the need for inclusive strategies that promote equitable parental involvement in mathematics education.

4.2.1.1 Frequency and nature of Parental Involvement in Children's Mathematics Learning

Many participants believed that the interaction between school and family significantly influences learning, academic achievement, and the quality of education that children receive. The frequency and quality of the relationships that can be established between both agents will determine, among other aspects, the children's mathematics performance. **Parent G** indicated:

"I work as a domestic worker and am illiterate, so there is no use for me to ask about my child's performance in mathematics because there is no help I can offer to my child."

Research by Kantova (2024) supports relationships between schools and parents in order to promote cooperative work between both, where the involvement of parents in the schoolchildren's learning can promote the educational achievement of children.

4.2.1.2 Differences in Involvement Based on Socio-Economic or Educational Background

Several parents pointed out that socioeconomic status plays a crucial role in perpetuating or reducing inequality within societies. Lower socio-economic status often leads to limited social mobility, as individuals face barriers to accessing opportunities for upward mobility.

"I am illiterate, and I earn a low salary, so I cannot afford to pay for my child's mathematics extra classes."

Studies by Ogbugo-Ololube (2016) support the idea that parent's educational background is another variable under socioeconomic variables that could affect children's academic performance. The relationship that existed between parents'

academic background and that of their children may be because of some unobserved biological qualities rather than an informal effect of parental education.

4.2.1.3 Role of Home Learning Environment in Supporting Mathematical Development

The environment that parents provide at home can support children's learning and development. Studies by Rose, Lehl, Ebert & Weinert (2018) provided empirical evidence that the home learning environment (HLE) is an essential predictor of children's academic and social differences.

"I don't see any reason for doing mathematics with my child at home; all her siblings were not good in the subject."

This response highlights a familiar perspective parents have toward mathematics. The research in this area has indicated that what parents do with their children mathematically and how often they do it is predictive of their child's mathematical ability. The quality of the home environment can contribute toward children's early mathematical development through parent-child engagement and mathematics-related activities.

4.2.1.4 Parent-child bond

The parent-child bond plays a vital role in fostering early mathematics skills. A strong, supportive bond creates a secure learning environment where children feel confident exploring new concepts, including mathematics.

Children are more willing to take chances and experiment with new ideas, like mathematics when they feel emotionally safe with their parents. Strong bonds allow kids to explore without worrying about making mistakes, which is essential for learning. Nobody knows a child's learning style, abilities, and shortcomings better than their parents. A strong relationship enables parents to modify arithmetic exercises and explanations to fit their child's specific requirements, improving the effectiveness of the learning process.

“The close relationship between parent and child allows for seamless integration of math into daily activities, such as counting objects, measuring ingredients, or sorting toys by size or shape. These informal interactions make math a natural part of everyday life, rather than a separate or stressful task.”

They also indicated that children would develop number sense at an early age, e.g., counting family members. Some parents indicated that when they bond with their children, it will make learning fun and easy for them to ask questions related to Mathematics. Engaging children in real-world tasks, like cooking, shopping, or even playing games that involve math, helps them see its practical applications. The bond makes these activities enjoyable and meaningful, fostering an early love for math.

“If I do Mathematics together with my child, he/she will like the subject.” “I encourage my child that nothing can be done without Mathematics, cooking, shopping, jumping, and playing with skipping rope you use Mathematics.”

According to data by Cole (2017), children's attitudes toward mathematics are positively influenced by parental expectations and early involvement in mathematical activities. Their performance and mathematical abilities are subsequently improved in subsequent years. Children's interest in mathematics can be sparked when parents value the topic in everyday life.

4.2.1.5 Parental reinforcement

When parents reinforce the importance of learning and persistence, children begin to take ownership of their education. They develop intrinsic motivation to improve their math skills, leading to greater self-confidence.

“When I promise my child to do something for him/her, it boosts his/her confidence and motivates him/her to do better.”

When parents align their reinforcement at home with what is being taught in school, it creates a cohesive learning experience. This reinforcement helps children see the continuity between home and school, increasing their motivation to succeed in both environments. Parents felt that engaging with their children about what they are

learning in math opens a line of communication where children feel comfortable discussing their struggles and successes. This builds trust and allows parents to offer targeted support when needed.

Research by Orth (2018), indicated that positive reinforcement from parents through praise, encouragement, and constructive feedback helps build a child's self-esteem. Children who feel supported are more confident in solving problems and tackling math challenges. Knowing that parents are supportive and available to help reduces the fear of failure. Children feel secure trying challenging problems because they know their parents are there to assist without judgment. Parents who guide rather than solve problems for their children help them become independent thinkers. Encouraging children to work through challenges on their own fosters a sense of accomplishment when they succeed.

4.3 THEME 3: IMPACT OF PARENTAL INVOLVEMENT ON CHILDREN'S MATHEMATICAL PERFORMANCE

Parents have been recognized as their child's first educator in life, and continue to be recognized as a significant contributor to the educational process once their child attends formal schooling. This section explores the impact that parents have in their children's mathematic performance. Parents have their own unique knowledge, values, experiences, and strengths to bring to the table with regards to their child's learning and overall development. This value placed on parents as significant educators and contributors in their child's life is undeniable. The pressure in today's society to bond the linkages between home and school environments is based in an ecological perspective, in which partnerships are developed to influence broad childhood outcomes positively. As such, family-school partnerships are continuously being promoted and strengthened. In doing so, families and educators agree to share responsibility and work together to create optimal learning environments for their children to flourish and grow.

4.3.1 Correlation Between Parental Involvement and Mathematical Performance

Many participants believed that parents' academic ambitions for their children might influence their children's academic achievements both directly and indirectly. Parents' academic ambition for their children has been identified to have a telling effect on the children's academic performance. Studies by Zhang (2018) show that parental involvement in education in line with expectations increases children's academic success, and parental involvement is at least important at school.

"I don't think my ambition can influence my child's mathematical learning because I do not have the necessary resources to help my child."

There are many ways that parents can be involved in their child's education, and these ways can affect the child's development and academic achievement. These kinds can be divided into groups according to the sort of activity, the environment in which it takes place, and the degree of involvement.

The type of parental involvement and the ways in which parents impact their children's learning are different when it comes to direct and indirect parental involvement in education, especially when it comes to subjects like mathematics.

4.3.1.1 Impact of Different Types of Parental Involvement

- **Direct Involvement:** When parents actively assist their children with their mathematics homework or participate in math-related activities with them (such as playing games or working through problems together), their children's mathematical abilities frequently improve. But the level of this participation is really important. Mathematics performance can be adversely affected by parents who are uneasy or who give bad advice; conversely, parents who are informed and able to provide helpful assistance witness more favourable results.

- **Indirect Involvement:** Higher mathematics performance is still correlated with indirect engagement, even if it is less hands-on and involves things like creating a supportive learning atmosphere or having high expectations. Academic results are frequently improved by cultivating a growth mindset, which is the conviction that aptitude and abilities can be enhanced through work, and by developing a positive attitude toward mathematics. Parents who highlight the value of hard effort and perseverance have found that their children are more inclined to stick with mastering challenging mathematic problems.

4.3.2 Influence on Learners' Confidence, Motivation, and Problem-Solving Skills

Many participants indicated that they encourage and praise their children for scoring high marks in mathematics, which motivates them to perform better than they did. According to research by Cunningham and Sood (2018), the problem-solving method may be considered a fundamental tool for the acquisition of new knowledge, notably learning transfer. The problem-solving method is purportedly efficient for the development of manual skills and experiential learning. **Parent I** stated:

"I don't see any reason to motivate my child because she is struggling even to do simple mathematics tasks like counting numbers."

This response underscores how parents' attitudes and influences can impact learners' performance in mathematics. Parents' encouragement and acknowledgment of achievements build learners' confidence.

4.3.3 Comparative Analysis of Learners with High versus Low Parental Involvement

Parents revealed that parental involvement significantly influences various aspects of learners' academic and personal development. Parents often discuss real-world problems and encourage analytical thinking. Learners know they can rely on parental advice or brainstorming for solutions. **Parent J** explains:

"I would to engage myself, but I feel reluctant and let my child find solution by himself or from peers."

Research supports that learners may struggle to develop structured approaches to problems without role models or parental input, which can lead to dependency on teachers or peers for solutions and difficulty handling challenges (Muralidharan and Singh, 2019).

4.4 THEME 4: EFFECTIVE STRATEGIES FOR PARENTS TO SUPPORT MATHEMATICS LEARNING

The strategies for parents to support their children's mathematics learning are very important. This section identifies how parents can engage in the mathematics education of their children, resources to use and collaboration between schools and parents to improve mathematical support. Mathematics often evokes strong emotions in both children and adults. While some find joy and excitement in solving mathematical problems, others may feel anxious or intimidated by numbers and equations.

Parents, educators, and caregivers must recognise the importance of fostering a positive attitude towards maths in children from an early age. A positive attitude towards maths enhances a child's academic performance and instils confidence, critical thinking skills, and problem-solving abilities that are invaluable throughout life. By exploring various strategies and approaches, parents can help children build a positive relationship with mathematics, laying the foundation for a lifelong love of learning and exploration in the realm of numbers and patterns.

4.4.1 Best Practice for Parental Engagement in Mathematics Education

Many participants revealed that high expectations of parents from mathematics classes may suggest that they have faith in their children and their teachers. It may also suggest that they are involved in the education process and that they find themselves sufficient. When we examine the studies about the expectations of parents and especially their engagement in education, it is observed that in the study conducted by Dinc (2017), there is a significant positive correlation between the perception of parent engagement and the success of the children based on the grade

point averages. In other words, as the parents' engagement in the children's education process increases, the learners' success in the lessons increases.

4.4.2 Uses of Resources such as Manipulative, Educational apps and Home-Based Activities

Manipulatives are physical objects that are used as teaching tools to engage students in the hands-on learning of mathematics. Manipulatives can be particularly effective in further developing conceptual understanding in mathematics because they help learners relate concrete ideas to abstract ideas and link informal approaches with formal approaches (Uribe-Flórez & Wilkins, 2010). Using hands-on, concrete manipulatives throughout math instruction can lead to higher retention rates and a more positive student attitude toward education in general. The early childhood years are critical in terms of development (McGuire, Kinzie & Berch, 2012), so it is important to explore instructional strategies that align with and cater to the young child's growing understanding of the world.

4.4.2.1 Mathematics Through Play

Children are highly motivated to learn, but not in a formal, instructional way; play can be regarded as a powerful vehicle for learning. Play and playfulness are at the core of early childhood education. Innovative approaches to early mathematics could draw on play, be it role-play, or board and card games. It must be recognized that role-play, or pretend play, requires much time for the children to set up the play frame, engage with it, and develop it (Fleer, 2018).

- To teach counting, addition, subtraction, and even multiplication, parents should utilize building blocks. For instance, parents can represent different values in equations by stacking blocks of different colours.

- Baking and Cooking: Allow kids to calculate amounts, measure ingredients, and split or double recipes. They are introduced to fractions and units of measurement through this, which also connects math to an enjoyable pastime.
- Logic puzzles and brain teasers: To improve problem-solving abilities, include puzzles and brain teasers like Sudoku, tangrams, or pattern games.
- Family math night: Families can organize an occasion where members of the community gather to engage in enjoyable arithmetic games and activities, such as snake ladder, to help develop a good attitude toward mathematics.
 - Math role-playing: Set up situations in which the children must manage cash, issue change, or figure out totals in the role of a shopkeeper.

4.4.2.2 Visual Aids and Manipulatives

The role played by mathematics in almost all life development areas cannot be underestimated. Mathematics serves as the backbone of all technological advancement in the world. There can be no meaningful development in this modern world of the technological era without adequate and sufficient knowledge of mathematics. The study of mathematics enhances one's understanding of the world through the language of symbols and abstract representation of phenomena. It is a subject that is very important for the academic excellence of people irrespective of programme of study. Knowledge in mathematics is applied in almost every school subject. According to Russel (2011), distributive property makes it easier to work with numbers and has many applications to learning algebra and mathematics as a whole

- Number Charts: Parents should put up visual aids in their home, such as number charts. Children can better understand numbers and their relationships, thanks to this.
- Geometric Shapes: To explain volume principles, parents should utilize tangible shapes or even everyday objects. Children can be taught how to measure objects, count angles, and count sides.

- **Abacuses and Counters:** To help younger children visualize addition, subtraction, and number grouping, abacuses or counting beads work great.
- **Drawing and Art:** Parents may integrate art and mathematics by creating forms and symmetry patterns.

4.4.2.3 Real-Life Applications

Mathematics is deeply integrated into everyday life, often in ways we might not immediately recognize. Its applications range from simple tasks to complex decision-making processes. In many ways, mathematics is an indispensable tool in navigating daily life, enhancing our understanding and efficiency in various tasks. Real-life connections provide a deeper understanding of the purpose of math concepts and skills. (Foley, Herts, Borgonovi, Guerriero, Levine & Beilock, 2017).

- Use shopping as a mathematics lesson. Children can help estimate costs, calculate discounts, or weigh fruits and vegetables. Encourage them to stick to a budget and see how math applies to everyday decisions.
- Parents should allow children to count real objects, like counting family members and counting their fingers and toes.

4.4.3 Collaboration Between Schools and Parents to Improve Mathematical Support

Collaborative efforts between parents and teachers play a crucial role in enhancing children's mathematical skills and performance, especially during the early years of education. When parents and teachers work together, they create a more cohesive and supportive learning environment that benefits the child's cognitive development, engagement with math, and overall academic success. Research by Li and Zhang (2023) supports that parent and community involvement in education stands as a

cornerstone for the holistic development of learners and the broader enhancement of societal well-being.

The majority of parents believe that teachers have insights into a child's strengths and areas that need improvement, while parents know their child's learning style and emotional needs. Collaborative efforts allow parents and teachers to share observations and strategies to support the child in personalized ways. **Parent K** indicated:

"If a child struggles with number recognition, the teacher may suggest hands-on activities like using number flashcards or games that we as parents can practice at home. Similarly, parents can provide teachers with feedback on what seems to work best, allowing for tailored teaching methods at home and in the classroom."

Some parents indicated that teachers can guide them on how to incorporate mathematics into daily routines at home. This will make mathematics more relevant to the child's world and help them practice mathematics in different contexts, enhancing understanding. Teachers suggested that parents should involve their children in activities like grocery shopping, where they can practice counting items, comparing prices, or estimating the total cost. This bridges the gap between abstract classroom concepts and real-world applications.

The relationship between a parent and teacher can force the child to work hard. Parents believe that working together with teachers will create an environment where children feel that they are valued and understood. When parents and teachers work together, children perform better in Mathematics. The child will start to develop a love and understanding of Mathematics.

Encouraging children to like mathematics can profoundly affect them by fostering their interest and self-assurance in the subject. The following are a few tactics parents can employ to get their children interested in arithmetic through play, visual aids, and practical applications:

Parents can help their children learn Mathematics more effectively and enjoy it by incorporating mathematics into fun activities, providing visual aids to help youngsters understand abstract concepts, and demonstrating how arithmetic is used in everyday life.

The majority of participants also indicated that workshops should be conducted to teach parents about the importance of their involvement in the acquisition of Mathematical skills for their children. To strengthen the relationship between parents and educators, participants suggested that educators should have meetings with parents every quarter to discuss issues relevant to Mathematical skills.

It was also recommended that teachers give homework daily on Mathematics to create more opportunities for parents to be involved in the mathematics activities of their children. Lastly, the majority of participants indicated that uneducated parents should attend Adult Basic Education Training.

The following were identified as the recommendations for increasing parental involvement in their children's Mathematical skills:

- Parents should have a parent meeting every quarter to share their experiences in helping their children in Mathematical skills.
- Parents should improvise or create time to assist their children in Mathematical skills.
- Give parents advice on how to help without assigning the child's homework. For example, rather than providing answers right away, provide open-ended questions that encourage problem-solving.
- Parents should be encouraged to keep in touch with teachers regularly to learn about their child's development and get advice on how to support them at home.

- Parents should help their children set attainable mathematics goals, such as learning a particular concept or raising test scores, and recognize and celebrate accomplishments.
- Parents need to be motivated to sign up for workshops or school math nights to learn about the curriculum and practical strategies to support their child's learning at home.

4.5 CONCLUSION

This chapter provided a detailed analysis and discussion of the findings on parental involvement in assisting children with mathematics learning. Through thematic analysis, four key themes emerged: the challenges parents face in supporting their children, the extent of their involvement in mathematical skill development, the impact of parental engagement on learners' mathematical performance, and effective strategies that parents can employ to enhance their children's learning experiences.

The findings revealed that while parents play a crucial role in their children's mathematical development, various barriers, such as limited mathematical knowledge, time constraints, and lack of confidence, often hinder their engagement. The study highlighted that increased parental involvement positively influences children's mathematical performance by fostering motivation, reinforcing learning outside the classroom, and enhancing problem-solving skills. The analysis emphasized the importance of equipping parents with effective strategies, including using practical, hands-on activities, digital tools, and collaboration with teachers to maximize their support.

The findings of this chapter underscore the significance of parental involvement in shaping children's mathematical success. Addressing parents' challenges and promoting effective support strategies can lead to improved learning outcomes. The next chapter will summarise the study, key conclusions, and recommendations for enhancing parental engagement in mathematics learning.

CHAPTER 5: SUMMARY, CONCLUSION, RECOMMENDATIONS

5.1 SUMMARY

This study sought to explore the role of parental involvement in the development of mathematical skills in Foundation Phase learners, specifically in Grade 1. In Chapter 1, the background to the study was outlined, highlighting the importance of early mathematical development and the influence that parental engagement has on children's learning. The problem statement emphasized the lack of sufficient research on how parents contribute to the development of mathematical skills at this early stage of schooling. The aim of the study was to understand how different forms of parental involvement, including behaviors, attitudes, and support strategies, affect children's early mathematical skills.

Chapter 2 provided a comprehensive literature review that presented key concepts related to parental involvement and early mathematical development. It also examined the significance of early math education and the influence of parents on their children's academic success. Various studies were reviewed, demonstrating the positive impact of parental engagement on the cognitive and academic growth of children in the Foundation Phase.

Chapter 3 described the research design and methodology. A qualitative research design was chosen to capture a detailed understanding of the participants' perspectives through semi-structured interviews, classroom observations, and document analysis. The data collection methods were aligned with the research objectives, and the rationale for choosing them was discussed.

In Chapter 4, the data collected through interviews, observations, and document analysis were analyzed and presented. The findings revealed that parents and teachers play crucial roles in supporting children's mathematical development. The data highlighted the variety of strategies parents employ to help their children understand mathematical concepts, from engaging in everyday math-related activities to providing formal educational support. The observations further confirmed that

teachers play a key role in reinforcing and extending the learning that parents initiate at home.

5.2 INTERPRETATION OF FINDINGS/RESULTS

The findings of this study provide valuable insights into the role of parental involvement in the development of children's mathematical skills during the early stages of education. Overall, the data indicate that parental engagement significantly and positively impacts children's understanding of mathematical concepts. This section will interpret the key findings and discuss their implications for parents and teachers.

First, the study revealed that children whose parents actively engage with them in activities promoting mathematical thinking such as counting, sorting, and problem-solving—demonstrate a deeper understanding of mathematical concepts. These activities help children learn basic math skills and support their cognitive development by encouraging them to think critically and logically. The hands-on involvement of parents in such activities provides children with a solid foundation for future mathematical learning.

The study highlighted that children with supportive and engaged parents perform better in school. Teachers reported that these children exhibited higher confidence and competence when tackling mathematical tasks in the classroom. This finding suggests that parental involvement enhances children's mathematical abilities and positively affects their attitudes toward learning. When parents provide encouragement and reinforcement at home, children are likelier to approach mathematical challenges with a positive mindset and greater self-assurance.

However, the study also uncovered several challenges that limit the effectiveness of parental involvement. One of the most significant barriers identified was some parents' lack of mathematical knowledge. Many parents expressed difficulty in helping their children with math due to a limited understanding of mathematical concepts, particularly those with lower educational backgrounds. Time constraints compounded this issue, as some parents struggled to find the time to engage in learning activities

due to work or other responsibilities. These factors can hinder the level of support parents can provide, even if they are willing to be involved in their children's learning.

Despite these challenges, the study found that certain forms of parental engagement were more important than others. While formal instruction and teaching specific math concepts are valuable, the research suggested that the creation of a positive attitude towards mathematics was even more crucial. Parents who fostered an environment where math was seen as fun and approachable rather than intimidating or difficult had a more significant impact on their children's learning. Being available to help with homework, encouraging effort, and emphasizing the importance of persistence in solving problems were effective strategies. Parents encourage a growth mindset, believing that abilities can improve with effort, help their children develop resilience and a more positive approach to learning.

The findings pointed to a need for better communication and collaboration between parents and teachers. While teachers recognized the importance of parental involvement, many expressed concerns about the lack of structured opportunities to engage parents in supporting their children's mathematical learning outside of the classroom. Teachers noted that there was no formal system or consistent approach for involving parents in activities related to math learning. This gap in communication means that opportunities for parents to understand how to best support their children's learning in the home environment may be missed.

The interpretation of the findings indicates that parental involvement is a key factor in the development of children's mathematical skills. However, for this involvement to be effective, it is important for parents to have access to the necessary support, resources, and strategies. Overcoming challenges such as limited mathematical knowledge and time constraints, fostering positive attitudes towards learning and strengthening the partnership between parents and teachers, can significantly enhance the impact of parental involvement on children's mathematical development.

5.3 CONCLUSIONS

This study concludes that parental involvement is critical in developing children's mathematical skills in the Foundation Phase. The findings clearly indicate that parents

who actively engage with their children in learning activities, whether at home or in the community, contribute significantly to building a solid foundation in mathematical understanding. These activities, such as counting, problem-solving, and fostering discussions about mathematical concepts, are vital in enhancing children's grasp of fundamental math skills.

One of the key conclusions drawn from this study is that parental involvement impacts children's mathematical abilities and promotes a positive attitude toward mathematics. When parents demonstrate enthusiasm for math and integrate it into daily life in a fun and approachable way, children are more likely to adopt a similar mindset. This positive attitude encourages children to view learning as a process of growth and discovery, where effort and persistence are valued over immediate success. The emphasis on effort and improvement, rather than simply focusing on the right answers, helps children develop a growth mindset, which is crucial for overcoming challenges in their educational journey.

Another important conclusion is the recognition of the essential role that teacher-parent collaboration plays in maximizing the benefits of parental involvement. Teachers are often seen as key facilitators in guiding parents on how to support their children's learning. The study found that while many parents are willing to be involved, they often need teachers' support and guidance on effectively contributing to their children's mathematical development. This could include sharing resources, providing suggestions for home-based activities, and explaining how parents can reinforce classroom learning in a way that aligns with the curriculum.

The study concluded that creating a strong partnership between home and school can bridge the gap between the support children receive at home and the learning occurring in the classroom. When parents and teachers work together, children benefit from consistent learning reinforcement across both environments. Teachers can offer strategies that parents can easily incorporate into their daily routines, while parents can provide teachers with insights into their children's strengths and challenges. This collaborative approach ensures that children receive a well-rounded and supportive learning experience inside and outside the classroom.

This study emphasizes the significance of parental involvement in children's mathematical development in the Foundation Phase. The active engagement of parents, coupled with effective teacher-parent collaboration, can greatly enhance children's mathematical understanding and foster a lifelong positive attitude towards learning. Creating strong partnerships between parents and teachers can enrich the learning process, benefiting children's academic growth and overall development.

5.4 RECOMMENDATIONS

The findings of this study offer several insights into how parental involvement in early mathematical development can be enhanced, with recommendations aimed at improving both the quantity and quality of this involvement.

One key recommendation is to enhance parent-teacher communication. Regular, structured communication between parents and teachers can ensure that both parties are aligned in supporting children's mathematical learning. Schools should consider organizing parent-teacher meetings, workshops, and newsletters that provide practical strategies for parents to assist their children at home. This would not only help parents feel more confident in their roles but also ensure that their efforts are complementary to what is being taught in the classroom. By keeping parents informed and engaged, teachers can provide clear guidance on reinforcing mathematical concepts at home, making the learning process more consistent and supportive.

Another important recommendation is to provide parental education through workshops or accessible resources that educate parents on basic mathematical concepts. These workshops should focus on how parents can integrate mathematics into everyday activities, showing them that math is not limited to formal classroom settings. Parents can be encouraged to incorporate activities like cooking, shopping, or simple games to help their children engage with numbers and shapes in a fun and meaningful way. Such initiatives would empower parents to support their children's learning in a relaxed and informal setting, making mathematics a part of daily life and reinforcing the connection between learning at school and at home.

Equally important is the encouragement of positive attitudes towards mathematics. Both parents and teachers play a crucial role in shaping how children perceive math. Parents should be encouraged to model problem-solving strategies, praise effort rather than innate ability, and avoid negative comments about mathematics. A positive attitude towards math can be cultivated by showing that making mistakes is a natural part of learning. This helps children develop a growth mindset, where they view challenges as opportunities to learn rather than obstacles to success. In doing so, parents and teachers can promote resilience and persistence, which are essential traits for success in math and beyond.

Another key recommendation involves community engagement. The broader community, including community centers, libraries, and local organizations, can offer additional support in children's mathematical learning. Schools should foster partnerships with these entities to provide resources and spaces where children can practice their math skills outside the school environment. These community-based initiatives can enrich children's learning experiences and provide alternative learning environments that complement formal education. By extending the reach of educational support beyond the classroom, communities can contribute meaningfully to the development of children's mathematical skills.

It is also essential to support parents facing various challenges, such as financial, educational, or time-related constraints. Some parents may struggle to support their children's learning due to these factors, so schools should offer targeted assistance. This could include providing flexible learning materials that do not require significant financial investment, offering time-efficient strategies for parents to engage with their children, and ensuring that all families, regardless of their background, feel equipped and empowered to contribute to their children's learning. By addressing these challenges, schools can ensure that all children, regardless of their socio-economic status, benefit from a supportive and engaging learning environment.

The recommendations based on this study aim to create a more supportive and inclusive environment for parental involvement in early mathematical development. By fostering strong communication between parents and teachers, offering educational resources, promoting positive attitudes, engaging the community, and supporting

families facing challenges, schools can significantly enhance the role of parents in their children's mathematical education.

5.5 LIMITATIONS OF THE STUDY

Despite the valuable insights gained from this study, several limitations were identified that may have influenced the findings and their generalizability.

One major limitation was the sample size. The study focused on a relatively small group of parents and teachers from a single school, limiting the findings' scope and diversity. A broader sample that includes participants from various schools, regions, and socio-economic backgrounds would have allowed for a more comprehensive understanding of how parental involvement influences children's mathematical development. A more diverse sample would also help capture a broader range of experiences, attitudes, and challenges different families face, providing a richer perspective.

Another limitation was the time constraints. The study was conducted within a limited time frame, which affected the depth and extent of the data collection and analysis. Because the research was condensed into a shorter period, there was limited opportunity for follow-up interactions with participants. This constraint may have hindered the ability to explore the topic in greater detail, especially considering the complex nature of parental involvement and its impact on children's learning. A longer study period could have allowed for a more in-depth exploration of the issues and the opportunity to gather more data from repeated or ongoing interactions with parents and teachers.

Resource limitations also played a role in the study's constraints. Financial and logistical challenges restricted the research in several ways. For instance, the study had limited access to necessary resources, such as recording equipment and the ability to conduct research across multiple schools. These limitations may have impacted the breadth of data that could be collected and the diversity of perspectives that could be included in the study. The inability to extend the research to multiple locations or provide more robust technological support might have constrained the potential findings and their application to a broader context.

To address these limitations, future research could aim to increase the sample size, incorporating participants from various schools and regions, enhancing the representativeness and generalizability of the results. Additionally, extending the duration of the study would allow for a more comprehensive investigation of parental involvement over time, offering insights into how these practices evolve and their long-term impact on children's mathematical development. Overcoming resource limitations, such as access to better equipment and a broader geographical scope, would further improve the depth and quality of the data, enabling a more nuanced understanding of parents' role in their children's education. By addressing these limitations, future studies can contribute to a more complete picture of the ways in which parental involvement shapes early mathematical learning.

5.6 AREAS OF FUTURE RESEARCH

Future research in parental involvement in early mathematics education can deepen our understanding of how this involvement impacts children's learning and long-term academic success. One important direction for future studies is the use of longitudinal research. Long-term studies could track children from the Foundation Phase through later school years, examining how early parental engagement in mathematics influences their academic outcomes over time. Such research could help clarify whether early support in mathematical learning leads to sustained academic achievement and how the impact evolves as children progress through different grade levels.

Another area for exploration is comparative studies that examine parental involvement's effects across different socio-economic and cultural contexts. This research could provide valuable insights into how varying socio-economic backgrounds and cultural beliefs shape parental engagement and how these factors influence children's mathematical development. By comparing these contexts, future studies could identify specific strategies particularly effective in diverse communities, leading to more targeted and inclusive approaches to involving parents in early education.

Research could also focus on interventions designed for parents who face difficulties in engaging with their children's mathematical learning. Many parents encounter challenges such as lack of time, limited educational backgrounds, or financial constraints. Investigating different models of teacher-parent collaboration and community support systems could provide practical solutions to help these parents. Such interventions could be tailored to meet the specific needs of struggling parents, making it easier for them to participate in their children's education and improve their learning outcomes.

Finally, future research could investigate the role of teacher training programs in preparing educators to work effectively with parents. Teachers play a critical role in facilitating parental involvement, but they may need more support in understanding how to engage parents meaningfully. Research into teacher education could explore how training programs can equip teachers with the necessary skills to foster strong partnerships with parents, ensuring that both parties work together to support children's mathematical development.

While this study provided important insights into the role of parental involvement in early mathematical education, there is still much to learn. Future research can build upon the findings of this study by exploring these areas in more depth, offering new strategies and interventions that could further strengthen the relationship between parents, teachers, and students to enhance mathematical learning in the early years.

5.7 CONCLUSION

This study explored the role of parental involvement in the development of mathematical skills in Grade 1 learners within the Foundation Phase. It highlighted how active parental engagement in mathematical activities, such as counting, problem-solving, and everyday learning, significantly enhances children's mathematical understanding. Parents who actively participated in their children's learning were observed to foster a positive attitude towards math, promoting children's confidence and competence in the subject. Teachers also noted that children with engaged parents performed better academically and demonstrated greater motivation in mathematics. However, the study also revealed challenges some parents face,

particularly those with limited mathematical knowledge or time constraints, making it difficult to support their children's learning.

The study concluded that parental involvement is crucial for developing a strong foundation in mathematics for young learners. It emphasized the need for effective teacher-parent collaboration, where teachers guide parents in assisting their children at home. Based on these findings, several recommendations were made, including enhancing communication between parents and teachers, offering parental education on mathematical concepts, fostering positive attitudes towards math, and supporting parents facing challenges. The study's limitations, such as a small sample size and time constraints, were acknowledged, and areas for future research were identified, including longitudinal studies and interventions to support struggling parents. This research emphasizes the importance of a strong partnership between home and school in nurturing children's mathematical skills in the early years.

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APPENDICES/ANNEXURES

Appendix A: Interview guide

Participant number:

Date.../.... /....

Gender

Male	
Female	

Age of participants

30 years or younger	
31 to 40 years	
40 to 50 years	

Appendix B: Ethical clearance

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR
NAME OF RESEARCHER/INVESTIGATOR: Mrs S
Manavhela

STUDENT NO:
1 1575151

PROJECT TITLE: The role of parents in developing
mathematical skills of their children in Grade I
ETHICAL CLEARANCE NO: FHSSE/24/ECE/05/2910

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION DEPARTMENT	ROLE
Dr MG Sikhwari	UNIVEN, Early Childhood Education	Supervisor
Mrs S Manavhela	UNIVEN, Early Childhood Education	Investigator Students

Type: Masters Research

Risk: Minimal risk to humans, animals or environment (Category 2)

Approval Period: October 2024 — October 2025

The Research Ethics Social Sciences Committee (RESSC) hereby approves your project as indicated above.

General Conditions

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following.

- The project leader (principal investigator) must report in the prescribed format to the REC:
- Annually (or as otherwise requested) on the progress of the project, and upon completion of the project.
- Within 48 hours in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project. – Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application. Would any changes to the protocol be deemed necessary during the course or the project the project leader must apply for approval of these changes at the REC. Would there be deviation from the project protocol the necessary approval of such changes, the ethics approval immediately and automatically (is) forfeited.
- The date approval indicates the first date that the project may be started. Would the project have to continue after the date; a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
 - Request access to any information/data at any time during the course or after completion of the project,
- To ask further questions; Seek additional information; Require further modification or monitor the conduct of your research or the informed consent process.
- withdraw or postpone approval if;
- Any unethical principles or practices of the project are revealed or suspected.



- It becomes apparent that any relevant information required report and reporting Of adverse events
 - New institutional rules, national legislation or international conventions A it necessary
- %thheld from the REC that information hag ~~een false~~ ormisrepresented. — The not done tirnely and accurately,

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE
Date Considered: October 2024

Name of the RESSC Chairperson of the Committee: Mwale MAQjpr.o Prof M
Signature...

UNIVERSITY OF VENDA
OFFICE OF THE DIRECTOR
RESEARCH AND INNOVATION

2024 -10- 29


PRIVATE BAG X5050, THOHOYANDOU, 09501 LIMP
TELEPHONE (015) 962 8504/831
"A quality driven financially sustainable, rural-bas

Mwale

Private Bag X5050
Thohoyandou xS050
0950

Appendix C: Informed consent form

All information provided to the research team will be treated as confidential.

Informed consent form to be signed by participants

I hereby confirm that I have been informed by the investigator, MANAVHELA SARINAH, about the nature, conduct, benefits, and risks of this study. I have also read the above information regarding this study.

I may withdraw my consent as well as participation in the study and declare that I had sufficient opportunity to ask questions and, therefore, declare myself prepared to participate in the study.

Participant Name: _____

Participant signature _____

Date _____

Investigator's name _____

Investigator signature _____

Date _____

I, MANAVHELA SARINAH, hereby confirm that the above participant has been fully informed about the nature of the study.

Witness name _____

Witness signature _____ **Date** _____

Appendix D: Letter granting permission from Limpopo Department of Basic Education



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

OFFICE OF THE PREMIER

TO: DR MC MAKOLA

FROM: PROF SWARTS

CHAIRPERSON: LIMPOPO PROVINCIAL RESEARCH ETHICS COMMITTEE (LPREC)

REVIEW DATE: 05 FEBRUARY 2025

**SUBJECT: THE ROLE OF PARENTS IN DEVELOPING MATHEMATICAL SKILLS OF
THEIR CHILDREN IN GRADE 1**

RESEARCHER: MANAVHELA S

Dear Colleague

The above researcher's research proposal served at the Limpopo Provincial Research Ethics Committee (LPREC). The committee is satisfied with the methodological and ethical soundness of the proposed study.

Decision: The proposal is granted full approval.

Regards

Chairperson: Prof I Swarts



Secretariat: Ms J Mokobi



Date: 17/02/2025

Appendix E: Letter requesting permission to collect data from the circuit

P.O.BOX 1006

Lwamondo

0985

THE CIRCUIT MANAGER

Mvudi Circuit

Private Bag X5006

Thohoyandou

0950

Dear Sir/ Madam

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

I am a student at the University of Venda, currently registered for master degree. I hereby request permission to conduct a research study.

The title of the research is: The role of parents in developing Mathematical skills of their children in Grade 1 in Mvudi Circuit

The ethical clearance certificate from the University of Venda and the Limpopo Department of Education are included.

Regards:

Manavhela Sarinah

Date

Appendix F: Turnitin



Digital Receipt

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author : sarinah manavhela

Assignment title : THE ROLE OF PARENTS IN DEVELOPING MATHEMATICAL SKILL...

Submission title : THE ROLE OF PARENTS IN DEVELOPING MATHEMATICAL SKILL...File name : SARINAH_MANAVHELA_FINAL_DOCUMENT_2_3_002.docx

File size : 232.42K

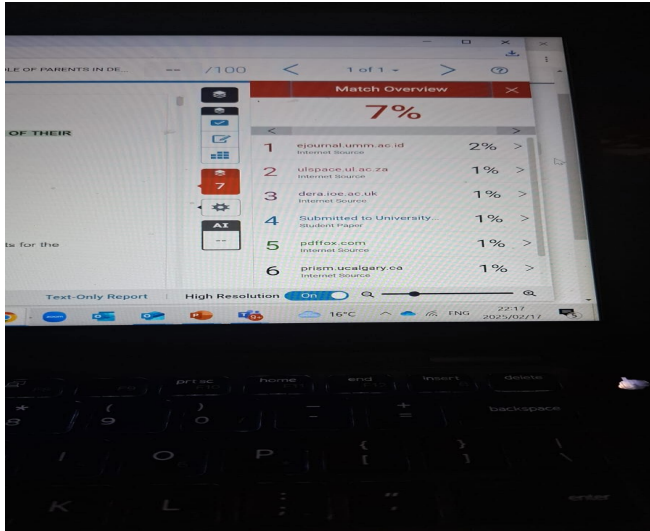
Page count : 113

Word count : 30,470

Character count : 185,643

Submission date : 17-Feb-2025 10:06PM (UTC+0200)

Submission ID : 2591326641



THE ROLE OF PARENTS IN DEVELOPING MATHEMATICAL SKILLS OF THEIR CHILDREN IN GRADE 1

MANAVHELA SARINAH
11575151

A Research paper/project/Mini-Dissertation submitted for the requirements for the

MASTERS DEGREE IN EDUCATION

At the
UNIVERSITY OF VENDA

SUPERVISOR: DR M SIKHWARI

CO-SUPERVISOR:

2025

APPENDIX G: Editorial letter

This serves to confirm that I, Dr. TE Sikitime, attached to the University of Venda, Department of English Media Studies and Linguistics, have proofread a proposal titled:

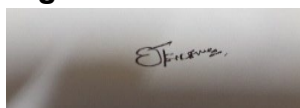
THE ROLE OF PARENTS IN DEVELOPING MATHEMATICAL SKILLS OF THEIR CHILDREN IN GRADE 1

BY

MANAVHELA SARINAH
11575151

Editorial work focused mainly on technical precision and common errors relating to syntax, diction, word order, and formulation of ideas. Corrections and suggestions were made for the student to effect before submission.

Signature



Date 13/ February 2025



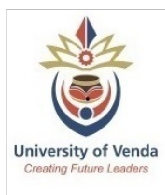
Ext: 015 962 8262

Mobile: 0832561666

Email: Emmanuel.sikitime@univen.ac.za

BA (ed), BA (Hons) English, Univen, BA Communication Science UNISA, MA (SLS)
Stellenbosch University, PhD (English) Univen

APPENDIX H: Proof of registration



PROOF OF REGISTRATION To Whom It May Concern

10-Dec-2024

It is hereby confirmed that the under mentioned person is a registered student at University of Venda PRODI41.

Student Number: 11575151
Student ID Number: 7406061347086
Name: SARINAH MOYO
Registered for Period: 09-Jan-2024 - 11-Dec-2024
Study Level: 2ND YEAR
Qualification: SEMEEC MED IN EARLY CHILDHOOD EDUCATION
Offering Type : MASTERS (SUCCESSIVE) FULL TIME

Subject	Description	Qual.	Class Group	Exam Year	Exam Month	Registration Date	Cancel Date	Stats Credits	Amount
EDU6001	H3 MASTERS STUDENTS DISSERTATION	SEMEEC	A	2024	11	15-Mar-2024		1.000	17330.00
Subtotal:									17330.00
Credit Total:									1.000
Total:									17330.00

Outstanding Balance: 43470.00

NB. The costs reflected in this document apply only to the current academic year's registration and do not constitute a financial statement of account. Registration fees, SRC levies, and residence costs are not included here but will appear on the financial statement of account.



DR. J.J. BALOYI
UNIVERSITY REGISTRAR

University of Venda
Creating Future Leaders



