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Understanding the Challenges and Strategies of Elementary Teachers in Teaching Numeracy Skills

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Abstract—This phenomenological study excavated the challenges and strategies of teachers in teaching numeracy particularly in New Corella District, Division of Davao del Norte. This also probed their coping mechanisms from the challenges they encountered, and their insights drawn from the findings of this study. Qualitative – phenomenological study was employed in exploring the views of the ten (10) elementary teachers of which primary instrument of data gathering was through in- depth interview. Major findings revealed that educators face various challenges in this endeavor, and three prominent issues are the low critical thinking skills of students, limited student engagement, and a lack of access to information and communication technology (ICT). Furthermore, three key strategies employed by teachers to enhance problem-solving skills are problem-based learning (PBL), the scaffolding approach, and fostering metacognition and self-regulation. Finally, the landscape of teaching problem-solving skills in mathematics is continually evolving, and educators play a pivotal role in shaping effective instructional practices. Three major themes emerge from the insights of teachers that are crucial to educational management: adaptive pedagogy, technology integration and access, and professional collaboration and learning communities. The exploration of challenges and strategies faced by teachers in teaching numeracy in mathematics for learners holds significant implications for educational research. Understanding the intricacies of this pedagogical landscape provides valuable insights that extend beyond the immediate classroom setting. These research findings have broad implications for teacher professional development, curriculum design, and educational policy formulation. By uncovering the challenges teachers encounter, researchers can inform targeted interventions and support systems to enhance teacher efficacy.

***Index Terms*—challenges, strategies, numeracy skills, elementary teachers.**

1. Introduction

The study on the challenges of teachers in teaching problem solving in mathematics is motivated by the crucial role problem-solving skills play in a student's mathematical development and overall cognitive growth. Effective problem-solving not only fosters a deeper understanding of mathematical concepts but also equips students with valuable life skills. However, numerous challenges confront teachers in their efforts to instill these skills. These challenges may include aligning problem-solving tasks with curriculum standards, addressing the diverse learning needs of students, promoting a growth mindset, and cultivating a supportive classroom environment that encourages risk-taking and resilience in the face of mathematical challenges. The study seeks to delve into these challenges and provide insights that can inform professional development, curriculum design, and instructional strategies aimed at enhancing the teaching of problem-solving skills in mathematics, ultimately benefiting both students and educators.

In Jamaica, the results of the study showed that teachers consistently employed a problem-solving approach in their instructional methods and expressed a high degree of confidence in their ability to do so. Among the most frequently cited difficulties were students' limited engagement and perseverance in problem-solving, the substantial workload faced by teachers, and the time-intensive nature of this approach. An important suggestion to mitigate these challenges is to introduce professional development programs for teachers, aimed at providing guidance on the effective integration of problem-solving as a teaching and learning method within the mathematics classroom, as recommended by McCarthy-Curvin and colleagues in 2020. Likewise, Turkey, elementary school teachers raised numerous concerns in various areas, such as limited time for in-depth content coverage, inadequate instructional hours, misalignment with standardized exams, challenges in connecting math to real-life scenarios, students' preparedness, economic constraints, insufficient teaching resources, the shift to remote learning, math anxiety, peer influences, and student motivation deficits (Karali, 2022).

In the Philippines, specifically in Banaba, instructing Mathematics to a varied and diverse group of students is a complex endeavor. Educators grapple with the dual challenge of imparting numerical concepts while simultaneously ensuring a comprehensive comprehension of Mathematics. Teachers in this region have confronted this daunting task. The researcher has witnessed the considerable difficulty most students encounter when tackling various mathematical skills. The belief that assisting individuals in grasping Mathematics extends beyond enhancing their numerical proficiencies has been a driving force. Foremost among the issues faced by teachers when it comes to teaching Mathematics are the attitudes of students and the constraints associated with time frames (Mojica, 2019).

Mathematics teachers in the New Corella District, Division of Davao del Norte, faced similar challenges. Among these, the

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primary issues encountered by teachers when instructing Mathematics were the attitudes of students and the constraints related to time. Elaborate and time-consuming lessons, coupled with students' unfavorable attitudes and perceptions towards their mathematical abilities and competence, were identified as significant hindrances to effective teaching and learning of Mathematics.

While many studies acknowledge the challenges of teaching problem-solving in mathematics, there may be a gap in research regarding the comparative effectiveness of different pedagogical strategies in addressing these challenges. For example, which instructional methods or approaches are most successful in improving students' problem-solving skills, and how can teachers be better supported in implementing them effectively? Numerous research endeavors have explored the challenges encountered in the teaching of mathematics at the primary school level. These investigations, utilizing diverse data collection methods, have consistently revealed a lack of differentiation in education programs, approaches, and policies concerning regional disparities (Çalışkan & Türkmen, 2016).

Furthermore, studies in the realm of technology integration (Sar & Akbaba Altun, 2015) and the pedagogy of number comprehension (Aydoğdu İskenderoğlu & Uzuner, 2017) have underscored related concerns. These research gaps can guide future studies to further our understanding of the challenges teachers encounter when teaching problem-solving in mathematics and help develop more effective strategies to address these challenges.

Effective problem-solving skills are not only crucial for success in mathematics but also for success in many aspects of life. Research in this area is essential because it directly contributes to improving the quality of education. When teachers are better equipped to teach problem-solving effectively, students develop stronger critical thinking and analytical skills, which can be applied in a wide range of real-life situations. There are often disparities in mathematics education and problem-solving abilities among different demographic groups. Research in this area can help educators identify and address these gaps, ensuring that all students, regardless of their background, have access to high-quality mathematics instruction.

The research on the challenges and strategies of teachers in problem-solving in mathematics has profound social relevance. It has the potential to enhance the quality of education, improve workforce capabilities, reduce achievement gaps, boost economic growth, drive innovation, address global challenges, promote lifelong learning, and foster equity and inclusion in education. As such, this research topic plays a critical role in shaping the future of education and society as a whole.

2. Purpose of the Study

The purpose of this phenomenological study was to explore the challenges and strategies of teachers in teaching numeracy, particularly in New Corella District, Division of Davao del Norte. This also probed their coping mechanisms from the challenges they encountered, and their insights drawn from the findings of this study.

At this stage of research, the experiences of teachers were generally defined as their learning and challenging experiences in teaching numeracy. Teaching strategies in numeracy were of paramount importance as they serve as the bridge between mathematical theory and practical application, enabling students to not only comprehend mathematical concepts but also to apply them effectively in real-life scenarios. These strategies equipped students with the critical thinking skills needed to tackle complex problems, fostering intellectual agility and adaptability, which were essential in an ever-evolving, technology-driven world. Effective teaching strategies in problem-solving mathematics not only nurtured students' mathematical proficiency but also cultivated their problem-solving abilities, instilling confidence, resilience, and a growth mindset that extends beyond the classroom, ultimately preparing them to meet the challenges of a rapidly changing global landscape and to contribute to innovative solutions in a wide range of fields, from science and engineering to economics and beyond.

Research Questions:

This study aimed to explore the challenges and strategies of teachers in teaching numeracy particularly in New Corella District, Division of Davao del Norte. Specifically, this study sought to answer the following research questions:

1. What are the challenges of teachers in teaching numeracy skills in mathematics?
2. What are the strategies of teachers in teaching numeracy skills in mathematics?
3. What are the insights of teachers in teaching numeracy skills in mathematics?

3. Methods

This research utilized qualitative research methodology, an investigative approach centered on the exploration and understanding of complex phenomena through the collection and analysis of non-numerical data. Typically, qualitative research was employed to gain insights into individuals' behaviors, attitudes, beliefs, and experiences within their natural settings. It played a vital role in delving into intricate issues and facilitated a deeper understanding of human behavior and the societal context. It complemented quantitative research, which focused on numerical data and statistical analysis, by providing a holistic and context-specific perspective on phenomena (Creswell, 2015).

The criteria for participant eligibility were outlined as follows: To be eligible for participation in this study, individuals had to meet the following prerequisites: (a) have a minimum of one year of teaching experience as a Teacher I in public elementary schools situated within the New Corella District, Division of Davao del Norte; (b) presently hold teaching positions as mathematics teachers within the district; (c) have encountered difficulties when teaching numeracy skills; and (d) identify as either male or female educators. Additionally, a total of ten participants were chosen for in-depth interviews, a sample size considered suitable for the purpose of clarifying the capacity to recognize and develop thematic components.

Data analysis in qualitative research was a multifaceted and critical phase that served as the linchpin for deriving meaning, insights, and understanding from the rich tapestry of data collected during the research journey. Unlike quantitative research, which dealt with numerical data, qualitative data analysis revolved around the in-depth examination of non-numeric data, such as interviews, observations, narratives, and documents, to unearth the underlying patterns, themes, and nuances. This process involved systematically organizing, coding, and interpreting the data to construct a comprehensive narrative that encapsulated the essence of the research topic. Data analysis in qualitative research was a dynamic and iterative process that demanded a keen eye for detail, methodological rigor, and a commitment to preserving the authenticity of participants' voices and experiences, ultimately yielding meaningful and contextually grounded findings (Akinyode & Khan, 2018). In this study, I highlighted the use of data coding, thematic analysis, and environmental triangulation.

4. Results and Discussions

A. Challenges of Teachers in Teaching Numeracy Skills in Mathematics

Teaching numeracy skills in mathematics is a crucial aspect of education that goes beyond rote memorization of formulas and procedures. It requires fostering critical thinking, active engagement, and the integration of technology to enhance the learning experience. However, educators face various challenges in this endeavor, and three prominent issues are the low critical thinking skills of students, limited student engagement, and a lack of access to information and communication technology (ICT). Addressing these challenges requires a multifaceted approach that combines pedagogical innovation, the promotion of critical thinking, increased student engagement strategies, and efforts to bridge the digital divide. By recognizing and actively working to overcome these hurdles, educators can better equip students with the problem-solving skills necessary for success in both mathematics and real-world applications.

1) Low Critical Thinking Skills of Students

One of the foremost challenges in teaching numeracy skills is the prevalent low level of critical thinking among students. Mathematics demands more than the ability to memorize and apply formulas; it requires analytical thinking, reasoning, and the capacity to solve complex problems. Many students struggle with these cognitive processes, often resorting to memorization rather than understanding the underlying concepts. This hinders their ability to approach mathematical challenges creatively and think critically about problem-solving strategies.

The fundamental objective of education is to prepare individuals who are proactive, self-motivated, and capable of independent problem-solving to confront and surmount ongoing challenges. In the 21st century, the ability to think critically and devise solutions is of paramount importance, as it equips individuals to navigate complex situations and overcome career-related obstacles. By incorporating specific techniques for solving mathematical problems into the learning process, students can acquire a problem-solving mindset that is applicable to a wider range of life situations. The findings of this paper offer teachers and educators' various approaches, educational models, and strategies to nurture 21st-century skills in students across all educational levels through classroom activities (Szabo et al., 2020).

Likewise, the findings suggest that the mathematics teaching approach in Manokwari closely resembles the conventional method employed in numerous other Indonesian regions. Students' proficiency in mathematical thinking during their mathematics education appears to be underdeveloped. To bring about a positive transformation, there is a clear need for a change in mathematics instruction in Manokwari, and, by extension, within the broader context of West Papua. The adoption of the Indonesian Realistic Mathematics Education (RME) model should be seriously contemplated as a means to enhance the caliber of mathematics education in Manokwari (Tanujaya et al., 2017).

2) Limited Engagement of Students

Keeping students actively engaged in the learning process is essential for effective teaching of numeracy skills. Traditional methods that rely heavily on lectures and textbooks may not captivate students' interest, leading to disengagement and a lack of enthusiasm for mathematics. Students need to see the real-world applications of mathematical concepts and be involved in interactive and collaborative activities. Limited engagement can result in a lack of motivation, hindering the development of problem-solving skills that require sustained effort and curiosity.

The study's results revealed that instructors regularly used a problem-solving approach in their instructional techniques and shown a strong sense of self-assurance in their capacity to do so. Commonly cited difficulties were students' restricted involvement and perseverance in problem-solving, the significant burden on instructors, and the time-consuming nature of this approach. A valuable suggestion to tackle these problems is to implement professional development programs for teachers, specifically designed to offer guidance on the successful integration of problem-solving as a teaching and learning strategy in mathematics classrooms, as proposed by McCarthy-Curvin and colleagues in 2020.

In 2022, Karali highlighted a wide range of concerns raised by elementary school teachers. These concerns include limited time for thorough content coverage, not enough instructional hours, mismatch with standardized exams, challenges in connecting math to real-life situations, students' readiness, financial constraints, lack of teaching resources, the shift to remote learning, math-related anxiety, peer influences, and deficiencies in student motivation.

3) Lack of Access to Information and Communication Technology (ICT)

In the digital age, incorporating ICT into the teaching of mathematics is vital for providing students with diverse learning opportunities. However, a significant challenge is the uneven access to technology among students. Disparities in resources and infrastructure create a divide, where some

students have access to computers, tablets, and the internet, while others do not. This inequality impedes the implementation of innovative teaching methods and digital tools that could enhance problem-solving skills. Without proper access to ICT, students may miss out on valuable resources and collaborative platforms that foster a deeper understanding of mathematical concepts.

Similarly, the research revealed that teachers have encountered three distinct challenges, namely, students' limited proficiency in the subject, insufficient class time, and a lack of access to information and communication technology (ICT) resources. These findings offer valuable insights for mathematics teachers, enabling them to gain a comprehensive understanding of the difficulties encountered when instructing students in the intricacies of sentence-based mathematics problem solving as part of providing a high-quality education to all students. Nevertheless, further research involving a larger and more diverse participant group is necessary to gain a more comprehensive understanding of the issues and challenges in various scenarios and the potential strategies for teaching sentence-based mathematics problem-solving skills (Ling et al., 2023).

Furthermore, studies in the realm of technology integration (Sar & Akbaba Altun, 2015) and the pedagogy of number comprehension (Aydoğdu Iskenderoglu & Uzuner, 2017) have underscored related concerns. These research gaps can guide future studies to further our understanding of the challenges teachers encounter when teaching problem-solving in mathematics and help develop more effective strategies to address these challenges.

B. Strategies of Teachers in Teaching Numeracy Skills in Mathematics

Teaching numeracy skills in mathematics is a dynamic and essential aspect of education that requires innovative and effective strategies. Educators play a pivotal role in shaping students' ability to analyze, reason, and solve complex mathematical problems. Three key strategies employed by teachers to enhance numeracy skills are Problem-Based Learning (PBL), the Scaffolding Approach, and fostering Metacognition and Self-Regulation. These approaches go beyond traditional teaching methods, encouraging students to actively engage with mathematical challenges, providing support through structured frameworks, and promoting reflective thinking to develop a deeper understanding of problem-solving processes. In this context, exploring how teachers implement these strategies offers insights into creating a more interactive and student-centered learning environment, ultimately equipping students with the critical skills necessary for success in mathematics and beyond. This discussion delved into the principles and application of each strategy, highlighting their contributions to fostering effective problem-solving skills in mathematics education.

1) Problem-Based Learning (PBL)

Problem-Based Learning is an instructional strategy that places students at the center of the learning process by presenting them with real-world, open-ended problems to solve. In a PBL approach, students collaborate to explore, analyze, and resolve complex problems, often drawn from authentic contexts. The emphasis is not only on finding solutions but also on understanding the underlying concepts and developing critical thinking skills. Teachers act as facilitators, guiding students through the problem-solving process while encouraging inquiry, investigation, and the application of mathematical principles. PBL not only enhances students' mathematical proficiency but also promotes skills such as teamwork, communication, and independent learning.

PBL involves presenting students with authentic, complex, and open-ended mathematical problems that require critical thinking and problem-solving. Students work in groups or individually to explore, analyze, and solve these problems. This approach not only enhances mathematical skills but also encourages students to apply their knowledge to real-world situations, making the learning experience more meaningful (Simamora et al., 2017).

Creative thinking and problem-solving abilities are considered essential competencies for 21st-century students. These skills need to be nurtured through the educational process, and they continue to pose challenges for teachers today. The findings illustrate that Problem-Based Learning (PBL) enhances (1) problem-solving skills by an average of 27% with a success rate of 47%, (2) creative thinking skills by an average of 11% with a success rate of 17.5%, and (3) overall learning outcomes by an average of 13% with a success rate of 15%. In conclusion, teachers can effectively incorporate PBL to enhance students' creative thinking skills, problem-solving abilities, and overall academic achievements (Khoiriyah & Husamah, 2018).

2) Scaffolding Approach

The Scaffolding Approach is a teaching strategy that involves providing structured support to students as they tackle challenging tasks, gradually reducing assistance as their understanding and competence grow. In the context of teaching numeracy skills in mathematics, teachers scaffold by breaking down complex problems into more manageable parts, offering guidance, and providing appropriate resources. This method aims to bridge the gap between the students' current abilities and the desired learning outcomes, ensuring that they can successfully navigate the problem-solving process. As students gain confidence and proficiency, the scaffolds are gradually removed, allowing them to take on more responsibility for their learning.

Scaffolding is a teaching strategy that provides support to students as they tackle mathematical problems. Initially, teachers offer more guidance and support, gradually reducing it as students become more proficient. This approach helps students build confidence, develop problem-solving strategies, and take ownership of their learning. Scaffolding can include providing hints, modeling the problem-solving process, and offering structured steps for approaching problems (Gasaway, 2022).

The study findings revealed the following: (1) Students who were instructed using the contextual learning model exhibited superior problem-solving skills compared to students who were

taught through the expository approach. (2) Students taught with the contextual learning model displayed greater self-confidence than their counterparts instructed using the expository method. (3) There exists a significant interaction between the learning model and the students' initial mathematical proficiency in enhancing their mathematical problem-solving aptitude. (4) A notable interaction is also evident between the learning model and the students' initial mathematical competence in bolstering their self-confidence (Surya & Putri, 2017).

3) Metacognition and Self-Regulation

Metacognition refers to the awareness and understanding of one's own thought processes, while self-regulation involves managing and controlling one's cognitive processes and behaviors. In teaching problem-solving skills in mathematics, educators emphasize metacognition and self-regulation to empower students to take charge of their learning. Teachers encourage students to reflect on their problem-solving approaches, identify strategies that work best for them, and monitor their progress. By fostering metacognitive skills, students become more aware of how they think and learn, enabling them to adapt their approaches to different problem-solving situations. Self-regulation, on the other hand, equips students with the ability to set goals, plan their problem-solving strategies, and evaluate their own performance, promoting a sense of autonomy and mastery in mathematical problem-solving.

Teaching students with metacognitive skills, such as problem analysis, planning, monitoring, and evaluation, is essential for effective problem solving. Encouraging students to think about their thought processes and approach problems systematically can significantly enhance their problem-solving abilities. Self-regulation strategies, like setting goals, managing time, and seeking help when needed, empower students to take control of their learning and tackle mathematical problems more effectively (Tian et al., 2018).

Further, educational innovations and enhancements are primarily driven by teachers. An essential area of exploration involves understanding the process by which teachers acquire the skill of using problem posing to teach mathematics in the classroom. This discussion underscores recent substantial discoveries regarding the use of problem posing in facilitating teachers' learning. Additionally, it delves into methodological challenges in problem-posing research and outlines the future trajectory of research concerning the development of teaching skills through problem posing. The international perspective offers a comprehensive outlook on strategies for integrating mathematical problem posing (MPP) into classroom instruction in a general sense and specifically for harnessing problem posing in the professional development of teachers (Cai & Hwang, 2020).

C. Insights of Teachers in Teaching Numeracy Skills in Mathematics

The landscape of teaching numeracy skills in mathematics is continually evolving, and educators play a pivotal role in shaping effective instructional practices. Three major themes emerge from the insights of teachers that are crucial to educational management: adaptive pedagogy, technology integration and access, and professional collaboration and learning communities. Adaptive pedagogy underscores the need for educators to tailor their teaching approaches to the diverse learning needs of students, emphasizing flexibility and responsiveness in instructional methods. Technology Integration and Access highlight the transformative role of technology in enhancing problem-solving instruction, while also stressing the importance of equitable access to these resources.

Lastly, Professional Collaboration and Learning Communities emphasize the value of creating environments where educators can collaborate, share best practices, and collectively address challenges in teaching mathematics. As educational leaders navigate the complex landscape of problem-solving education, these themes provide valuable insights for shaping policies, professional development initiatives, and resource allocation to foster an inclusive and effective learning environment. Understanding and addressing these themes are integral to educational management strategies that aim to enhance the quality of mathematics education and prepare students for the challenges of problem-solving in the 21st century.

1) Adaptive Pedagogy

Teachers frequently highlight the need for adaptive pedagogy when teaching numeracy in mathematics. They emphasize the importance of tailoring instructional approaches to the diverse needs and learning styles of students. Recognizing that not all learners grasp concepts at the same pace, teachers advocate for flexibility in their teaching methods, employing various strategies such as differentiated instruction, personalized feedback, and the integration of diverse resources. This theme emphasizes the necessity for educational management to support professional development initiatives that empower teachers with the skills to adapt their pedagogical approaches, ensuring an inclusive and effective learning environment for all students.

In the realm of critical mathematics education, dialogical processes serve as a vital wellspring for engaging in critical activities. A pivotal aspect of this approach is maintaining a critical stance towards mathematics itself, which entails the readiness to scrutinize any preconceived mathematical knowledge and to question the methods employed in applying mathematics. Equally important is the ability to apply mathematical principles as a means of critical examination when confronting instances of social and environmental injustice. Similar to the nature of dialogue, critique is an open-ended endeavor. No critique can lay claim to absolute validity; instead, critique perpetually advances with a provisional and exploratory character. This perspective holds significant implications for any critical undertaking, including the field of critical mathematics education (Skovsmose, 2023).

Realistic Mathematics Education, often referred to as RME, is a specialized instructional theory designed for the teaching of mathematics and was formulated in the Netherlands. A key feature of RME is its emphasis on placing significant

importance on real, "authentic" scenarios within the educational process. These real-life situations play a central role in kickstarting the creation of mathematical ideas, techniques, and methods. They also serve as a backdrop where students, as they advance, can put their mathematical understanding into practice. Over time, this knowledge becomes progressively more abstract and universally applicable, moving away from its initial context-specific nature (Van den Heuvel-Panhuizen & Drijvers, 2020).

2) Technology Integration and Access

Teachers consistently emphasize the role of technology in enhancing problem-solving instruction in mathematics. The theme of technology integration underscores the importance of providing educators with the necessary tools and training to incorporate digital resources, simulations, and interactive platforms into their teaching methods. Furthermore, the issue of access to technology surfaces as a critical concern, highlighting the need for educational management to address the digital divide and ensure equitable access to technological resources for all students. Effective educational management involves strategic planning and resource allocation to bridge these gaps and create a technologically enriched learning environment that supports problem-solving skills development.

Incorporating digital technology into schooling poses difficulties. This research presents findings from three high school mathematics classrooms in which instructors endeavored to enhance their teaching methods and promote student learning by including a digital tool. Through the utilization of interviews and observations, we have determined that the primary hindrance to student learning is a deficiently created social artifact. Students encounter challenges in using the instrument proficiently when professors fail to cultivate collective norms in technology utilization. When instructors do not actively use the tool, they lack a complete understanding of how pupils may benefit from it and are unable to assist them in combining instructions from both the teacher and the technology. Students sometimes find themselves in a situation where they have to juggle the demands of both their teachers and technology, rather than experiencing a seamless integration of both (Viberg et al., 2023).

Likewise, the objective was to analyze the impact of technology integration on the critical and creative thinking abilities, multidimensional 21st century skills, and academic accomplishments of prospective teachers specializing in scientific education within pedagogical domains. The study findings indicate that the progressive incorporation of technology into the educational process has favorable outcomes in terms of enhancing potential teachers' critical and creative thinking abilities, multi-faceted 21st century capabilities, and academic performance (Yilmaz, 2021).

3) Professional Collaboration and Learning Communities

Teachers stress the significance of professional collaboration and the establishment of learning communities within educational settings. This theme emphasizes the importance of creating opportunities for teachers to collaborate, share insights, and collectively solve problem challenges related to teaching mathematics. Teachers must value collaborative environments that facilitate the exchange of effective practices, resources, and strategies for enhancing problem-solving instruction. Educational management plays a crucial role in fostering a supportive culture that encourages collaboration, provides platforms for professional development, and recognizes the value of learning communities as catalysts for continuous improvement in teaching problem-solving skills in mathematics.

The results of the study showed that teachers consistently employed a problem-solving approach in their instructional methods and expressed a high degree of confidence in their ability to do so. Among the most frequently cited difficulties were students' limited engagement and perseverance in problem-solving, the substantial workload faced by teachers, and the time-intensive nature of this approach. An important suggestion to mitigate these challenges is to introduce professional development programs for teachers, aimed at providing guidance on the effective integration of problem-solving as a teaching and learning method within the mathematics classroom, as recommended by McCarthy-Curvin and colleagues in 2020.

Based on the data analysis and interpretation, the study arrived at the conclusion that students, teachers, and parents each have pivotal roles to play in creating a conducive environment for enhancing pass rates. Several factors contribute to challenges in learning mathematics, including a disconnect between new mathematical concepts and previously acquired mathematical knowledge, apprehension about mathematics, negative emotional associations with the subject, economic circumstances, educational backgrounds, the school's management system, inadequate school infrastructure, and the absence of a consistent school assessment system (Acharya, 2017).

5. Implications and Future Directions

A. Implications

The exploration of challenges and strategies faced by teachers in teaching numeracy skills in mathematics for learners holds significant implications for educational research. Understanding the intricacies of this pedagogical landscape provides valuable insights that extend beyond the immediate classroom setting. These research findings have broad implications for teacher professional development, curriculum design, and educational policy formulation. By uncovering the challenges teachers encounter, researchers can inform targeted interventions and support systems to enhance teacher efficacy. Similarly, insights into effective strategies open avenues for developing evidence-based teaching methodologies that can be shared across educational contexts.

Moreover, this research contributes to the ongoing discourse on improving mathematics education, fostering a comprehensive understanding of the factors that influence the acquisition of problem-solving skills. The implications extend to educational leaders, policymakers, and curriculum designers, offering a foundation for informed decision-making aimed at elevating the quality of mathematics education and, by

extension, nurturing a generation of learners equipped with essential problem-solving competencies.

Overall, these implications aim to advance teaching practices, inform educational leadership, and contribute to the continuous improvement of mathematics education by emphasizing the importance of collaborative efforts and learning communities in fostering problem-solving skills among learners.

B. Future Directions of the Study

As we navigate the complex landscape of mathematics education, understanding the challenges and strategies in teaching numeracy skills remains a critical endeavor with implications for both educators and learners. Looking ahead, the future directions of this study hold the promise of refining and expanding our insights into the multifaceted aspects of effective pedagogy. Future research endeavors can explore emerging challenges in the dynamically evolving educational environment, considering the influence of technological advancements, changes in curriculum frameworks, and the shifting dynamics of student engagement. Additionally, there is an opportunity to delve deeper into the integration of innovative teaching strategies and explore their long-term impact on students' problem-solving abilities. Investigations into the intersectionality of challenges, such as the interplay between limited access to technology and low critical thinking skills, can unveil nuanced dynamics requiring tailored interventions.

Moreover, future research can explore the role of cultural diversity and inclusivity in shaping effective strategies, recognizing the unique contributions that diverse perspectives bring to problem-solving education. As we embark on these future directions, the goal is to inform evidence-based practices, empower educators with targeted support, and contribute to the ongoing transformation of mathematics education to meet the evolving needs of learners in the years to come.

Department of Education: The Department of Education can take a leading role in shaping the future of understanding challenges and strategies in teaching numeracy skills in mathematics. This involves integrating research findings into curriculum development, ensuring that it aligns with emerging challenges and effective strategies identified in the study. The department can also invest in professional development programs that equip teachers with the skills to navigate these challenges successfully. Embracing technology and supporting initiatives to bridge digital divides will be crucial. Moreover, the department can foster collaborative initiatives, creating platforms for teachers to share best practices and engage in continuous learning.

School Administrators: School administrators play a pivotal role in translating research insights into actionable strategies within educational institutions. They can prioritize resource allocation to address specific challenges identified, such as promoting access to technology or fostering a culture of professional collaboration. Administrators can also create a conducive environment that encourages innovative teaching strategies, providing teachers with the necessary support and encouragement. Implementing feedback mechanisms and channels for open communication can further enhance the effectiveness of strategies in addressing challenges at the school level.

Teachers: Teachers are at the forefront of implementing effective strategies and overcoming challenges in teaching numeracy skills. Future directions for teachers involve embracing ongoing professional development opportunities to stay abreast of evolving pedagogical approaches. This includes honing technological skills, incorporating innovative teaching methods, and fostering a classroom culture that encourages critical thinking. Teachers can also actively engage in collaborative efforts within learning communities to share experiences and collectively address challenges. The integration of reflective practices into teaching methodologies can enhance metacognition and self-regulation, further contributing to students' problem-solving proficiency.

Future Researchers: For future researchers, the study points towards several avenues of exploration. This includes delving deeper into the nuanced dynamics between various challenges and strategies, conducting longitudinal studies to assess the long-term impact of certain approaches, and exploring the role of cultural and socio-economic factors in shaping effective pedagogical strategies. There's also an opportunity to explore the intersectionality of challenges and strategies, such as how limited access to technology may impact the effectiveness of specific teaching methods. Future researchers can contribute by continually refining our understanding of the complex landscape of teaching problem-solving skills, ensuring that educational practices remain dynamic and responsive to the evolving needs of learners.

In conclusion, the future directions outlined in this study pave the way for a transformative journey in understanding the challenges and strategies in teaching numeracy skills in mathematics. As we look ahead, the integration of innovative pedagogical strategies, emphasis on technological literacy, and the cultivation of collaborative learning communities emerge as paramount. The study encourages educational institutions, administrators, and teachers to actively engage with these future directions, integrating research insights into curriculum design, resource allocation, and professional development initiatives. For future researchers, the suggested avenues offer a rich terrain for exploration, providing opportunities to deepen our understanding of the intricate dynamics within mathematics education. By collectively embracing these future directions, we aspire to build a resilient educational framework that not only addresses current challenges but also anticipates and navigates the evolving needs of learners, fostering a generation adept at critical thinking and problem-solving for the challenges of tomorrow.

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