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REIMAGINING NUMERACY LEARNING IN INDONESIAN PRIMARY SCHOOLS: DESIGNING ASSESSMENTS AND RETHINKING POLICY IN LAMONGAN REGENCY

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Abstract
Measurement of numeracy skills is given in solving problems in various types of appropriate contexts. The assessment created is still in the development stage so that trials are needed to examine theoretical perspectives regarding the design of numeracy AKM questions. The numeracy ability assessment developed aims to measure students' thinking abilities in using concepts, procedures, facts, mathematical tools to solve everyday problems that are relevant in various contexts. Some of the things tested in the numeracy ability assessment are numbers, geometry and measurement, data and uncertainty, and algebra. This study uses a qualitative approach with a qualitative research type. The research procedure can produce descriptive data in the form of spoken or written words from humans and observable behavior or actions .The subjects of this study were 36 teachers and 200 elementary school students in Lamongan Regency, East Java Province, from six different sub-districts: Babat, Karanggeneng, Brondong, Tikung, Sukodadi, and Made. Lamongan Regency was chosen as the research location because its socio-cultural, educational, and numeracy landscape still requires a specialized approach, and the absence of a transformative policy for mathematics learning, resulting in many schools still experiencing low numeracy skills
Keywords: Mathematics Learning; Numeracy Skills; Policy; Lamongan.

INTRODUCTION

Numeracy ability is one of the basic competencies that is very important in education, especially at the elementary school level. Numeracy is not only related to the ability to count, but also includes the ability to understand, interpret and use numbers in various contexts of daily life. In the national curriculum, numeracy skills are an integral part of Mathematics lessons and are developed gradually from low to high grades (Gilbert, H., et al 2023). Numeracy is the focus of the Minimum Competency Assessment and also the focus of the National Literacy Movement (GLN) (Atmazaki et al., 2017). Furthermore, one indicator of the quality of education in a country is seen from the numeracy skills of its students, one of which can be seen from the results of PISA (Deacon, L., & Ní Fhloinn, E. 2023). However, various results of national and international education evaluations show that the numeracy skills of Indonesian students, especially at the elementary school level, are still relatively low. The results of the Computer-Based National Assessment (ANBK) and international studies such as PISA (Programme for International Student Assessment) indicate that many students experience difficulties in solving problems that require numerical reasoning, understanding basic mathematical concepts, and their application in real-life contexts.
The importance of numeracy skills for students in academic situations and everyday life does not have implications for the good quality of students' mathematical literacy in Indonesia. Numeracy ability assessments are carried out to measure students' abilities in using concepts and/or procedures as well as facts and/or mathematical tools (Maryuliana, 2016). Measurement of numeracy skills is given in solving problems in various types of appropriate contexts. The assessment created is still in the development stage so that trials are needed to examine theoretical perspectives regarding the design of numeracy AKM questions. The numeracy ability assessment developed aims to measure students' thinking abilities in using concepts, procedures, facts, mathematical tools to solve everyday problems that are relevant in various contexts. Some of the things tested in the numeracy ability assessment are numbers, geometry and measurement, data and uncertainty, and algebra.

PISA results show that Indonesia is ranked 75th out of 80 countries with a score of 379 out of a maximum score of 500 (Jackson, K., et al 2023). This data illustrates that the achievement of Indonesian students, especially in the numeracy aspect, is still far from satisfactory. This is also directly proportional to the PISA results, since the PISA survey was conducted in 2000, the latest score in 2018 for Indonesia was 379 (Zhai, X., Gu, J., et al 2017). Furthermore, PISA results show that students still experience difficulties, even in solving level 1 and 2 problems Aidinopoulou, V., & Sampson, D. G. (2017). Other studies show that the numeracy skills of the majority of students are still relatively low, where only 34.04% and 14.89% of students are classified as having high and medium numeracy skills, respectively, and 51.06% of students are still classified as having low numeracy skills (Yuniati et al., 2020). Similar research was conducted in Elementary Schools regarding numeracy skills in Konawe Regency, and it was found that students' ability to solve PISA-type questions had not reached 60% for all levels Song, Y., & Kapur, M. (2017).

The Education Report, a government innovation to improve education quality, provides a significant opportunity for schools to conduct more systematic evaluation and planning. This analytical tool is designed to present comprehensive data on various educational indicators, including student learning outcomes, the quality of the learning environment, and overall school performance Lo, C. K., & Hew, K. F. (2017). This data serves as a crucial foundation for schools to design interventions that are evidence-based and oriented towards tangible results. By utilizing the Education Report, schools can take the following strategic steps: First, Identify Root Problems in Detail. Data from the Education Report allows schools to more clearly understand weaknesses in the learning system. For example, schools can analyze whether low numeracy competency is caused by an irrelevant learning approach, a lack of supporting learning media, or perhaps limitations in teacher competency in teaching numeracy concepts.

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The difficulty students experience in learning fractions in mathematics is linked to the fundamental differences between whole numbers and fractions. This leads to an integer bias, which refers to students overgeneralizing their knowledge of whole numbers to fractions (Weinhandl, R., et al. 2021). This means that students adapt the concept of whole numbers to their understanding of fractions, which subsequently leads to misunderstandings about fractions due to the inherent differences between whole numbers and fractions. For example, whole numbers are represented by a single number, while fractions are represented by two numbers and a fraction bar.

The second difference between fractions and integers that is the reason why fractions are difficult is that integers can be counted and ordered. When comparing integers, students can use counting strategies to identify the larger number because each number in the counting sequence always has a value greater than the previous number (for example, 3 > 2). This counting strategy is used by students in ordering and comparing fractions. This is a common mistake made by students in applying the properties of integers to compare fractional values. For example, students often think that 1 12 is greater than 1 2 because 12 is greater than 2. Therefore, Malone & Fuchs (2017) found that 65% of errors in ordering fractions in grade IV were caused by students who incorrectly applied integers to order numbers into fractions, for example 1 8 > 16 > 13.

Several factors are suspected to contribute to students' low numeracy skills in fractions, including teacher-centered learning methods, a lack of realistic contexts in numeracy problems, and low student interest and motivation in mathematics. Furthermore, the home learning environment and the lack of support for learning technology also influence the development of students' numeracy skills. Therefore, special attention is needed to develop numeracy skills from an early age in elementary schools. Efforts to improve this depend not only on the curriculum but also on learning strategies, teacher competence, and a conducive learning environment (Russo, J., et al., 2020). This way, students will not only be able to calculate mechanically but also be able to think logically and critically, and be able to solve problems related to numbers and data in everyday life.

Based on the results of interviews with the principals of the research locations, it was found that the school only had a mathematics learning model on certain topics. Interviews were also conducted with teachers of grades I-VI regarding fraction learning who stated that students appeared passive during mathematics lessons in class, especially when studying fractions. The absence of a learning model when the concept of fraction material was given so that students only became listeners. This means that students were still not given the opportunity to discover the fraction concepts themselves being studied. In addition to conducting interviews with principals and teachers, a preliminary study related to numeracy skills in fraction material was also conducted involving 200 students from 6 different schools. The preliminary study was conducted by giving three fraction problems in the form of story problems that

included indicators of numeracy skills, namely (1) Using various numbers and symbols related to basic mathematics to solve problems in various contexts of everyday life; (2) Analyzing information presented in various forms (graphs, tables, charts, diagrams and so on); (3) Interpreting the results of the analysis to predict and make decisions Sun, K. L. (2019). Students' numeracy skills are still relatively low, as reflected in the results of a preliminary study of fractions. It was found that almost all students' answer patterns indicated a lack of understanding of the concept of fractions. Almost all students were unable to use fractions and basic mathematical symbols to solve everyday problems presented in the questions. Furthermore, students were unable to analyze information presented in images and interpret the results of their analysis to solve the problems presented.

In the story problems given, students have not been able to grasp information about the concepts of ordinary fractions, mixed fractions, and equivalent fractions, even most students in grades I-VI from six different schools have not been able to read and state fractions according to the pictures provided in the problem. Of the 200 students involved in the preliminary study, two schools were still found with moderate numeracy skills and two schools with low numeracy skills. In accordance with the average and standard deviation which are classified as very low, it is concluded that students' numeracy skills, especially in the material of fractions, still need to be improved, because they are still not in accordance with what is expected.

The novelty of this research lies in its specific approach to students' numeracy skills in the Indonesian context. Through cutting-edge analysis, this research explores the elements of fulfilling elementary school students' numeracy skills in Lamongan district. This novelty is also manifested in the focus on integrating students' numeracy skills with the conditions of schools with high, low, and medium numeracy skills as a whole in elementary school mathematics learning. The hypothesis in this study is that students' numeracy skills in each school, both directly and indirectly through structured interviews, have a positive and significant influence on problems related to students' numeracy skills, which of course must be integrated with students' critical and creative thinking skills. By understanding the existing conditions, this study proposes an appropriate mathematics learning model to address students' numeracy skills that are more responsive to local challenges, creating innovative solutions to improve the sustainability of elementary school students' numeracy skills in Lamongan district.

Two research questions underlie this study: (a) Analyzing the numeracy skills of elementary school students in Lamongan district. and (b) Analyzing the current mathematics learning model in measuring the numeracy skills of elementary school students in Lamongan district.

LITERATURE REVIEW

Numeracy Skills in Education: Challenges and the Future

Numeracy skills encompass the cognitive capacity and skills needed to utilize numbers and basic mathematical symbols to solve contextual problems and process information in various formats such as graphs, tables, charts, and diagrams. These skills also encompass the interpretation of analytical results to make predictions and make informed decisions. According to Gray, N., (2022). Numeracy is the competence in applying various types of numbers or basic mathematical symbols to solve practical problems in real-world contexts. More simply, Numeracy can be understood as the ability to apply the concepts of numbers and mathematical symbols to address challenges in everyday life. Numeracy provides a strong foundation for more complex mathematics learning at subsequent levels of schooling. At the elementary school level, students begin learning about numbers, including how to recognize, write, and count them. They also begin performing basic operations such as addition, subtraction, multiplication, and division. A solid understanding of these basic operations is crucial, as all more complex mathematical concepts are introduced through these skills. Strong numeracy skills enable students to understand basic mathematical concepts, such as fractions and decimals. These skills are crucial for understanding more complex concepts such as algebra and geometry. Research shows that students with strong numeracy skills in the early grades are more likely to succeed in mathematics later in life Hwang, G., & Lai, C.-L. (2017). Students with strong numeracy literacy are not only more successful in mathematics but also in other disciplines that require analytical and problem-solving skills. Strong numeracy skills can equip students with the logical and critical thinking skills essential for various aspects of learning.

Future challenges to Numeracy skills necessitate the development of innovative and adaptive learning media and methods. To improve the quality of numeracy learning, the development of innovative and adaptive learning media and methods is crucial. This development aims to make mathematics learning more engaging, interactive, and tailored to the increasingly diverse needs of students. One crucial step is designing learning aids that can facilitate students' understanding of mathematical concepts in a more contextual and enjoyable way Munter, C., & Wilhelm, A. G. (2021).. For example, technology-based educational games can help students understand the concepts of numbers, mathematical operations, and statistics interactively. These games can take the form of mobile applications or websites that provide math quizzes, context-based simulation problems, and challenges that motivate students to learn independently and continuously. In addition, independent learning modules will also be developed to provide flexibility for students with varying learning styles. These modules contain material that can be studied independently outside of school hours, complete with math problems and clear explanations. The use of digital media also provides opportunities for students to learn in a more engaging way that is in line with current technological

developments. This technology-based learning is expected to increase students' active participation and help them understand complex material in a simpler way. Munter, C. (2014).2.2 Numeracy and Transformative Mathematics Learning Policy

Indonesian students' math skills have declined, with scores dropping from 379 in 2018 to 366. The data also shows that only 18% of Indonesian students are able to reach level 2 in mathematics, significantly below the OECD average of 69%. This situation demonstrates the urgency of improving learning methods at the elementary school level to improve the quality of numeracy teaching (Chun Tie, Y.,et al 2019). One solution that can be implemented is to adopt a more contextual and interactive learning approach, making it easier for students to understand and apply calculation concepts in real-life contexts (Kotsopoulos, D., et al 2018).

In formulating mathematics learning policies, it is required to have characteristics in the form of (1) having a goal that is directed towards contributing to education (2) an education policy must have a formal legal aspect that is in accordance with constitutional requirements (3) having a clear operational concept so that it can be implemented (Misfeldt, M., et al 2020)The operational concept is characterized by the creation of mathematics learning policies by the authorities in terms of position and expertise, open to evaluation and having a good system so that it is far from being fragile if a series of factors are missing and clash with each other. An effective transformative mathematics learning policy will not give a pragmatic impression, let alone discriminatory, to the target community, on the contrary the community will feel that it benefits and is facilitated by its existence Pörn, R., Hemmi, K., & Kallio-Kujala, P. (2021)

The creation of transformative mathematics learning policies will impact its role as the primary reference for members of an institution in behaving. Educational policies should always be solution-oriented and proactive, unlike those inherent in rules or laws.22 Thus, in practice, educational policies become highly adaptive and interpretive due to their dynamic principles without having to eliminate specific local characteristics. In the educational sphere, policies play a crucial role in ensuring the success of all roles within the educational process, both within the government and in society Rezat, S., Fan, L., & Pepin, B. (2021).

Fundamental skills equip students with the ability to apply number concepts and arithmetic operations in everyday life, as well as the ability to select, calculate, analyze, and use information to make decisions. Based on these two limitations, it is clear that numeracy plays a significant role in a person's growth and development. The concept of numeracy, highlighted by the World Education Forum Vinnervik, P. (2022a), is evident in six key aspects: numeracy, science, digital numeracy, finance, and culture and citizenship. The 2016 School Numeracy Improvement Movement also underscored the importance of accessing, understanding, and intelligently using information amidst the dynamics of society and technological developments Munthe, M. (2022).. Therefore, the concept of literacy is an integral foundation in addressing the increasingly complex demands of the era. One component of the Graduate Competency Standards is student numeracy skills. The Independent Curriculum monitors achievement through the National Assessment. The Education Report Card Platform communicates the results to schools and local governments.

In Indonesia, mathematics learning initiatives represent a shift towards a more flexible education system that adapts to problem-solving skills. However, researchers argue that a transformative education policy framework is needed to integrate digitalization with sustainable education goals Vinnervik, P. (2022b).. There is a growing need for learning innovations that address students' numeracy skills, involving stakeholders from the government, private sector, and non-governmental organizations to develop sustainable digital education models that benefit all learners.

Educational Models and Numeracy Skills

In Indonesia, the concept of education has undergone various evolutions along with changing times and societal needs. Education is the process of developing individuals with social awareness, moral maturity, and cultural sensitivity, who not only master knowledge but also demonstrate social responsibility and concern for others Bråting, K., & Kilhamn, C. (2022).. Educational experts, both domestic and international, have made significant contributions to formulating the definition and objectives of education. Their insights not only enrich our understanding of education but also provide direction for more effective and relevant educational practices. Education is a purposefully designed effort to influence students so they can develop their potential optimally and become whole human beings(Elicer, R.,et bal 2023). Numeracy skills have been key to unlocking opportunities and social mobility. Since ancient times, those who could count and operate with arithmetic often had greater access to knowledge and power. In the modern context, numeracy remains a key determinant of individual and societal well-being. It enables people to access the information they need to make informed decisions, both in their personal and professional lives.

Numeracy allows individuals to understand and analyze the quantitative information they encounter every day. From managing a household budget, to understanding statistics in the news, to making investment decisions, numeracy skills are key to effective navigation in a world increasingly filled with data and numbers Kaufmann, O. T., & Stenseth, B. (2021).. In school, numeracy helps students to understand basic mathematical concepts necessary for advanced study and real-life applications. Strong numeracy not only improves students' academic performance but also equips them with essential life skills. This ability helps students become more independent in making data-driven decisions, both in personal and professional situations in the future. Therefore, numeracy development from an early age must be a priority in the basic education system to create a generation that is intelligent, critical, and

independent in facing future challenges Lie, J., Hauge, I., & Meaney, T. (2017).
Numeracy involves more than just counting skills; it also develops critical thinking skills. In the context of numeracy literacy, students are taught to analyze problems involving numbers. For example, in a math lesson that includes calculating total shopping costs, students must be able to identify purchased items, their respective prices, and calculate the total. This process can involve problem-solving that requires further analysis of the available information Kilhamn, C., & Bråting, K. (2021).. After analyzing the problem, students can find the right solution. For example, when students learn to calculate a discount on an item, they need to understand how to calculate a percentage and apply it to the original price. This process teaches students to think creatively in finding solutions. The critical thinking skills acquired through numeracy literacy are invaluable in various aspects of life. Despite the extensive literature on numeracy skills, several gaps remain. Longitudinal studies analyzing how learning models influence sustainability numeracy outcomes in Indonesia are lacking Swedish National Agency of Education. (2022). Further research is needed to develop numeracy learning models that align with Indonesia's diverse socio-economic and geographical conditions. Furthermore, it is necessary to examine the readiness of educators and students to adopt numeracy learning models and skills, as well as the effectiveness of various mathematics learning approaches in fostering sustainability awareness and action (Earl, C. 2017).

METHOD

This study uses a qualitative approach with a qualitative research type. The research procedure can produce descriptive data in the form of spoken or written words from humans and observable behavior or actions (Johnson,et al 2020). The data in this study were obtained by recording student communication with educators during classroom learning. The research participants were educators and elementary school students in Lamongan, East Java Province, Indonesia. The researcher selected schools based on high, medium, and low literacy skills in six different schools. Table 1 shows how the researcher conducted observations of six elementary schools in Lamongan Regency, East Java Province, focusing on literacy skills in fraction material referring to the principle of elementary school students' numeracy abilities. The data in this study were interviews and problem-solving studies on fraction material. The data collection methods used in this study were recording and note-taking techniques. The recording technique was carried out by recording the learning process without the students' knowledge, student interviews, and learning outcome tests. The recording procedure for recording data in literacy skills was obtained from recordings from March to June 2025. The data analysis technique used in this study applied an interactive analysis model through data reduction, data presentation, and drawing conclusions (H. Ibda et al 2023)Data validity used source and data triangulation. There are several codes, such as D-01, D-02 used to refer to data of students who have low literacy skills. Codes E-01, E-02 for students with moderate numeracy skills and for students with high numeracy skills F-01, F-02. Other codes, such as G-01, G-02 are used to refer to educator data.Participants
The subjects of this study were 36 teachers and 200 elementary school students in Lamongan Regency, East Java Province, from six different sub-districts: Babat, Karanggeneng, Brondong, Tikung, Sukodadi, and Made. Lamongan Regency was chosen as the research location because its socio-cultural, educational, and numeracy landscape still requires a specialized approach, and the absence of a transformative policy for mathematics learning, resulting in many schools still experiencing low numeracy skills. The Lamongan Regency government has implemented various programs to improve numeracy skills and integrated mathematics learning models into schools, making it an ideal case study for examining numeracy skills. Lamongan Regency's commitment to sustainability aligns with the goals of mathematics learning. The region has a strong educational consciousness, as reflected in its sustainable education system. Given that mathematics learning aims to equip students with the knowledge and skills needed for sustainable development, Ka provides a relevant context for analyzing how digital education can enhance these efforts

Table 1. Observation School

No	School	Adress	Numeracy Ability
1	SDN Made 4	Jl. Made Karyo No.43, Mademadya, Made, Kec. Lamongan, Kabupaten Lamongan, Jawa Timur 62251	High
2	SDN Brondong	Jl. R.A. Kartini No.26, Brondong, Kec. Brondong, Kabupaten Lamongan, Jawa Timur 62263	Low

3	SDN Tambakrigadung 2	Jl. Raya Jatirejo, Tuwiri, Tambakrigadung, Kec. Tikung, Kabupaten Lamongan, Jawa Timur 62281	High
4	SD Muhammdiyah 1 Babat	Jl. Tanggulrejo No. 02, Babat, Lamongan, Jawa Timur	Low
5	SD Muhammadiyah 1 Karanggeneg	Ketawang, Karanggeneng, Kec. Karang Geneng, Kabupaten Lamongan, Jawa Timur 62254	Medium
6	SD Negeri 2 Sukodadi	Merjoyo, Sukodadi, Kec. Sukodadi, Kabupaten Lamongan, Jawa Timur 62253	Medium

3.1Data Collection

This study uses a qualitative approach with a qualitative research type. Research procedures can produce descriptive data in the form of spoken or written words from humans and observable behavior or actions (Flick, 2018)data in this study were obtained by recording student communication with educators during classroom learning. The research participants were educators and elementary school students in Lamongan, East Java Province, Indonesia. Researchers selected schools based on high, medium, and low literacy skills in six different schools. Table 1 shows how researchers conducted observations of six elementary schools in Lamongan Regency, East Java Province, focusing on literacy skills in fraction material that refers to the principle of elementary school students' numeracy abilities. The data in this study were interviews and problem-solving studies on fraction material. The data collection methods used in this study were recording and note-taking techniques. The recording technique was carried out by recording the learning process without the students' knowledge, student interviews, and learning outcome tests.

RESULTS AND DISCUSSION

The results of this research analysis are to answer the second and third research questions or objectives, namely (a) Analyzing the numeracy abilities of elementary school students in Lamongan district. and (b) Analyzing the current mathematics learning model in measuring the numeracy abilities of elementary school students in Lamongan district.
General Description of Research Variables

This section presents the challenges faced by teachers in implementing the revised mathematics curriculum in the Ohangwena Region, Namibia. From the data analysis, seven themes emerged that represent the challenges faced by teachers in implementing the revised mathematics curriculum in the Ohangwena Region; these themes are presented in Table 2 below. The results are presented in the form of themes, followed by a discussion and contextualization of the results using relevant research. Mathematics teachers who participated in this study are identified by the letter "T" followed by a numeric identifier, and heads of department are identified by the letters "HOD" followed by a numeric identifier.

Table 2. Descriptive Student numeracy ability data

No	School	High numeracy ability	Medium numeracy ability	Low numeracy ability
1	SDN Made 4	18 student	8 student	7 student
2	SDN Brondong	8 student	6 student	20 student
3	SDN Tambakrigadung 2	19 student	9 student	4 student
4	SD Muhammdiyah 1 Babat	20 student	10 student	4 student
5	SD Muhammadiyah 1	15 student	7 student	10 student

	Karanggeneg			
6	SD Negeri 2 Sukodadi	14 student	10 Siswa	11 student

Teachers' challenges in analyzing students' numeracy abilities

Challenging Fractions Learning Material

D.02 commented, “The content of the questions is not challenging enough, ma'am, where most of the topics in the syllabus require me to delve into things that I have learned that are difficult to understand.” This statement was also supported by F 01, who stated, “Ma'am, there are some specific questions that I don't understand in the questions and I asked my colleagues, but I will try to study them, ma'am.” Similarly, E 02 stated, “Colleagues who have not studied higher-level mathematics will find the new numeracy questions very difficult.” According to input from E 02, D 02, and F 02, the principal and mathematics teachers felt that the questions presented in the updated mathematical fraction material were difficult to implement because they lacked the necessary skills and knowledge. This is consistent with the findings of Liebendörfer, M et al(2023). who found that mathematics teachers in Lamongan district lacked the pedagogical and subject matter expertise required by the updated mathematics curriculum, especially those who were implementing the curriculum for the first time. In other countries such as South Africa, China, and the United States, teachers also face challenges related to difficult new mathematics learning content, not only in mathematics but also in other subjects. Then G 01 said that the difficult mathematics problem content faced by teachers in these countries is most likely the result of curriculum reforms in many subjects that were implemented without adequate teacher preparation, so that implementation to students is also less than optimal and is still found, making it difficult for teachers to understand new teaching ideas, methods, or strategies. Therefore, it is difficult for teachers to apply students' numeracy skills and provide high-quality knowledge to students if they do not understand the curriculum content and its requirements.

Analysis of Heavy Questions

G 02 stated that "the content is too much in analyzing numeracy skills, as I said, it's a mix of core, advanced, and advanced levels. There's no longer a level for students to choose from." G 03 expressed a similar view, stating, "The workload on general and advanced questions is too much, and in the generalization stage, we end up teaching extra on weekends, holidays, and evenings just to make sure students master everything." G 02 reinforced this idea by stating: "The math content for elementary school is too long, and for elementary school it's even longer because it's offered for only one year. So, the content for elementary school is only offered for one semester because students have holidays and exams." On the other hand, G 03 offered a counterargument, stating, "I think the workload depends on the teacher's experience. When I first started teaching, I thought the curriculum was too long, but by the second cycle, I had completed the syllabus. So, the more experienced you are, the faster you can teach and master each type of problem to present to students." However, it appears that elementary school mathematics teachers are required to have specific competencies due to a lack of familiarity with the mathematics curriculum, and the sheer volume of material makes implementing changes difficult. The views of G, G, G, and G 03 reflect the excessive difficulty of implementing an amended mathematics curriculum. (Wilson et al 2017) found that teachers were reluctant to adopt a new, integrated mathematics curriculum due to their overwhelming workload. Curriculum modifications also significantly increased the difficulty of implementing numeracy skills for teachers of various subjects in places such as South Africa and Washington. One explanation is the increased content and new approaches to teaching, as curriculum modifications often add additional topics, teaching methodologies, and assessment methods, requiring more preparation time for teachers. In Ohangwena Region, mathematics teachers indicated that although some had difficulty integrating the rigorous curriculum, others were successful and found that greater experience made the process easier.

Lack of Student Motivation

Every student has a different perspective on mathematics. Those who find mathematics enjoyable will develop motivation to learn it and be optimistic about solving challenging problems. Conversely, those who consider mathematics difficult will be pessimistic about solving math problems and dislike mathematics, which hinders the achievement of learning objectives. Learning objectives will be achieved if the planning and methods used can influence students' potential and abilities. This success will be achieved if students are involved in their thinking process and numeracy skills. "The majority of students are unmotivated. They are too dependent on the teacher (Weinhandl, R et al 2023). They still want to be pushed to do what they are supposed to do." In line with this, the opinion of stated, "The students we accept from Grades I-VI from other schools tend to be less motivated at the beginning. We ask them to repeat the grade so they can at least improve their abilities and also stay motivated." made a similar observation, stating, “Students are not motivated. Some students are able to cope, but some will say, ‘Ma’am, we came with a U.’” Another participant , explained this concept succinctly, stating, “Many students in social studies reject this subject because they know that mathematics is not a requirement in any subject they will take in the future. So, there is no motivation.” However, provided evidence to the contrary, stating, “AS [advanced level] learners are quite motivated and they are able to achieve their best level without any encouragement from their teachers. This is because of the fear that AS level is difficult to motivate them to learn.”

Limitation

Limitations One of the main limitations of this study is its entirely centralized qualitative research approach, which focused on a small, purposefully selected sample of only six elementary schools in Lamongan Regency. Therefore, the applicability of these findings to other regions or a larger group of elementary school mathematics teachers in Lamongan is limited by its narrow focus. Similarly, this study focused exclusively on students who were also the primary participants in assessing numeracy skills in practicing the newly revised mathematics curriculum. Consequently, the results solely represent the perspectives of the implementers, and ignore the experiences of students who interact with the curriculum on a daily basis. Another major limitation related to the data collection tool is the exclusive use of semi-structured interviews. The absence of classroom observations limited data triangulation and may limit teachers' understanding of the real-world challenges faced when implementing the revised mathematics instruction.

REKOMENDATION

Recommendations This study suggests several steps to address the challenges teachers face in addressing students' numeracy skills in Lamongan Regency in implementing the updated mathematics learning. First, the Ministry of Education should provide schools with adequate educational resources, such as mathematics tools and textbooks. Furthermore, the Ministry should provide adequate training to teachers to enhance their pedagogical and content knowledge. Furthermore, curriculum developers should provide additional instructional time. Furthermore, mathematics should be divided into core, intermediate, and advanced levels; syllabus content should also be distributed evenly across grade levels to reduce workload. Furthermore, teachers should inspire students by using positive reinforcement and inviting motivational speakers to schools. Similarly, to address classroom overcrowding, schools should implement a staffing norm policy, which states that the teacher-student ratio should be one teacher for every 20 secondary school students. Furthermore, it is recommended that future researchers consider using a mixed-methods design that combines qualitative and quantitative approaches to capture a broader range of mathematics teachers' perspectives on implementing the revised curriculum and allow for broader generalization of the results. In addition, future research should involve students to complement the findings and offer a deeper understanding of the difficulties and effectiveness of curriculum implementation from the perspectives of both implementers and students.

DISCUSSION

In summary, the findings of this study highlight the key challenges mathematics teachers in Lamongan Regency face in implementing mathematics instruction to measure students' numeracy skills in fractions integrated into the updated mathematics curriculum, making it easier to implement. In implementing the updated curriculum, mathematics teachers face several challenges, including challenging subject matter, inadequate educational resources, an understanding of excessive mathematical problem development, a lack of teacher training, inadequate teaching time, overcrowded classrooms, and a lack of student motivation. Teachers in Lamongan Regency believe that the following strategies will help them overcome these challenges in curriculum implementation and will enhance their experience with the curriculum reform: providing adequate training to teachers and providing adequate materials to schools; dividing mathematics into core, intermediate, and higher levels; allocating more time for instruction; empowering students; and implementing staffing standards policies. Collectively, these findings suggest that, to empower teachers to design more successful and satisfying mathematics learning experiences for literacy improvement, the Ministry of Education and policymakers should prioritize addressing these implementation challenges. In addition, the findings of this study have broader implications for educational policy and practice, highlighting the need to fund training programs for teachers and provide teaching resources that promote comprehensive and highly engaging learning experiences.

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