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STUDENTS' NUMERACY LITERACY SKILLS IN MATHEMATICS LEARNING IN ELEMENTARY SCHOOL AS A FOUNDATION FOR THE FUTURE

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ABSTRACT

Numeracy is a critical skill as a provision and foundation for students for the future. Numerical literacy skills will help students deal with life problems when they shop or examine the information, ideas, and problems they face more deeply, so they can draw conclusions and solve problems appropriately. This research aims to analyze numeracy skills in mathematics learning in elementary school. This research uses a descriptive qualitative method. The data collection technique in this study used a 3-item description test, The indicators of numeracy skills include: 1) Using various kinds of numbers and symbols related to basic mathematics to solve problems in various contexts of daily life; 2) Using mathematical reasoning in problem-solving and communicating; 3) Selecting and applying appropriate and simple problem-solving strategies, and presenting situations. Data was also gathered through interviews with fifth-grade homeroom teachers. The research subjects were 18 fifth-grade students of SDN Kesenden. Data analysis techniques in the form of an average percentage of each indicator of numeracy skills obtained were 50% for the first, 52% for the second, and 52% for the third. Based on the results of the average data analysis on each indicator, the numeracy skills of fifth-grade students of SDN Kesenden obtained a result of 51%, which means that the numeracy skills of students are at the medium category level.

Keywords: Numeracy, Literacy, Mathematics, Elementary School.

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PRELIMINARY

Education is an effort to prepare and grow the quality of human resources that are capable, superior and function as agents of social change. Education produces the critical consciousness needed for individual and societal development. As the main subject and object of education, humans must be able to improve themselves through education. Education, both formal and informal, is a means of building a complete Indonesian human being and always strives to develop and create quality human resources (Awaluddin, 2021).

The purpose of national education is to enable students to form democratic, responsible, knowledgeable, moral, competent, independent, healthy, and highly creative citizens. Education must be planned with appropriate goals, strategies, and resources, and proper evaluation must be performed to measure its effectiveness (UU Nomor 20 Tahun 2003, 2003). Education also aims to foster critical thinking skills and shape learners to face future challenges. In addition to critical and creative reasoning abilities, learners must also develop six essential literacy skills to be more competitive in facing the challenges of 21st-century learning (Fajriyah, 2022). Reading, writing, and math skills are essential for all children to participate fully in education and society.

Numeracy is the capability to learn forms of writing, reading, and math skills. Literacy skills are related to reading, numeracy, financial literacy of science literacy, digital literacy, cultural literacy, and citizenship (Dewayani et al., 2021). Numeracy is not only reading & writing skills, but also an understanding, interpreting, and processing information in various forms: text, images, numbers, diagrams, graphs, and videos. In learning, numeracy becomes a tool for learners to think critically & reflectively, not just receiving raw information, but being able to analyze, relate, and infer meaning from various sources. In other words, numeracy is defined as the ability of learners to decipher information related to numbers, describe and analyze a problem, and then conclude the problem (Zahrah et al., 2024).

The ability itself can be interpreted as a skill in a person to carry out work properly. According to (Solehan, 2024) ability refers to expertise or proficiency and is interpreted as a willingness to undertake tasks for implementation. Meanwhile, according to (Latifah, 2018) the ability is the capacity of an individual to carry out tasks and a job. From some of the things mentioned, it is obtained that ability is a skill a person has in understanding a certain field.

The Organization for Economic Cooperation and Development (OECD) implements a program called the Program for International Student Assessment (PISA). Based on the results of the PISA in 2022, Indonesia's reading literacy score regressed by 12 points from the 2018 PISA results. The results also suggest the backwardness of Indonesian students, which is 117 points from the average global literacy score. Sadly, only 25.46% of students in Indonesia meet the minimum competency standards for numeracy contained in PISA (OECD, 2023). The decline in numeracy skills causes students to be slow when answering and handling problems (Nofiana & Julianto, 2018). This situation makes learners face obstacles when linking theoretical concepts in life (Halawa et al., 2024). Learners are less

cooperative in the face of change, unable to put knowledge into practice, hard to solve problems and slow to make conclusions and decisions (Yusmar & Fadilah, 2023). Based on these results, there are certainly many problem factors that influence the low average gap in numeracy achievement in Indonesia.

Numeracy skills are crucial in education, especially in knowledge to help students face various life problems and future challenges in school. Because this ability is a very important insight. The statement of the Minister of Education and Culture (2018) in this regard, states that the qualification of life skills in the 21st-century Indonesian nation is the ability to foster a culture of numeracy with integrated education, which starts from education in the family, school, to the community environment.

Based on observations made in class V SDN Kesenden Kota Cirebon, there were still students who were slow in understanding and analyzing problems, especially those in the form of story problems that contained a lot of long readings. Learners also have difficulty and confusion in understanding numeracy problems that combine several numbers and graphs in a reading, learners also look confused when working on story-shaped math problems, and there are still learners who have not mastered the basic concepts of mathematics. The barriers experienced by some students lead to low numeracy skills. According to (Jazilah et al., 2023) learners who have an unfavorable numeracy level tend to also possess an unfavorable independent character, thus impeding their ability to analyze both present life problems and future challenges.

There is still learning anxiety and difficulties experienced in translating and understanding story problems in everyday life (Salvia et al., 2022). The lack of students' skills in understanding this basic concept will affect numeracy. Therefore, it is necessary to comprehend the basic concepts of numeracy for learners to contribute to society and the challenges of 21st-century learning. In addition, numeracy skills are very important for the 21st-century era, especially in math. Excellent numeracy skills of students will make them feel comfortable and more contextually meaningful (Fajriyah, 2022). The numeracy skills are said to be at a moderate level, which is caused by several obstacles faced, namely, the lack of stimulus for students in reasoning about the concept of numeracy, the lack of literature to develop innovations in carrying out numeracy activities and the limited number of adequate reading books (Pratiwi et al., 2023).

According to (Irmawati & Ilmah, 2022), indicators are needed to measure numeracy skills. The reference indicators used to determine the numeracy skills of students are in the OECD (*Organization for Education Cooperation and Development*) which consists of three

indicators, using numbers and symbols related to basic mathematics to solve problems in daily life contexts, using mathematical reasoning in solving problems and communicating them, selecting and applying appropriate and simple problem-solving strategies, and being able to present situations. To address these issues, this study aims to investigate the numeracy skills of fifth-grade students at SDN Kesenden in mathematics learning as an essential foundation for their future.

METHODS

The methods used in this research are descriptive, namely a data processing research that describes in detail and depth the social reality that occurs (Rio & Pujiastuti, 2020). Meanwhile, qualitative research is data in the form of words, schemes, and images (Sugiyono, 2011). This approach is used to find out and obtain data about students' numeracy skills.

This research was implemented in the even semester of the 2024/2025 school year at Kesenden Elementary School in Cirebon City. The subjects were 18 fifth-grade students. The target of this research is students' numeracy skills as a foundation for facing future challenges.

The data collection techniques used in this study included tests and interviews. A test is a data collection technique based on numeracy questions to obtain data about the numeracy skills of students. The interview is a data collection technique carried out with homeroom teachers to validate the reality of data covering vital aspects in assessing students' numeracy skills. An indicator is needed to measure numeracy skills when measuring numeracy variables. The reference to being applied in this study is found in the OECD (*Organization for Economic Cooperation and Development*).

Table 1. Indicators of Numeracy Skills

Variable	Indicators
Numeracy Skills	1. Using various kinds of numbers and symbols related to basic mathematics to solve problems in various contexts of daily life;
	2. Using mathematical reasoning in problem-solving and communicating;
	3. Selecting and applying appropriate and simple problem-solving strategies, and presenting situations.

(OECD, 2023)

Data analysis methods in research include data reduction for data processing, data presentation to facilitate the analysis stage, and conclusion drawing to convey interpretation

(Sugiyono, 2011). The assessment used to analyze students' answers uses the following formula (Arikunto, 2018).

$$P = \frac{f}{N} \; x \; 100$$

Description:

P: Percentage

F: The number of scores obtained by students

N: Total maximum score (ideal)

Furthermore, to find out the level of students' numeracy skills, the acquisition score will be processed into a rating scale as follows:

Table 2. Categorization of Numeracy Levels

Percentage	**Criteria**
80-100	Very High
60-80	High
40-60	Medium
20-40	Low
0-20	Very Low

(Asrul et al., 2014)

RESULT AND DISCUSSION

This research aimed to analyze numeracy skills in mathematics learning at Kesenden Elementary School, Cirebon City. The subject of this research is grade V students. Founded based on numeracy skills, this research aimed to analyze numeracy skills in mathematics learning at Kesenden Elementary School, Cirebon City. Each question contains indicators of numeracy skills, namely: 1) Able to use various types of numbers and symbols related to basic mathematical operations to solve problems in everyday life; 2) Use mathematical reasoning in solving problems and communicating them; and 3) Interpret analysis results to predict, formulate, and make decisions. The research findings describe the data on the income of students' numeracy skills as follows.

Table 3. Data acquisition of students' numeracy skills

Analysis	**Score**
Number of Learners	18
Average	51.5
Maximum Score	83
Minimum Score	16

As a whole, from the numeracy test results that have been tested through the test instrument, it was found that the maximum score earned by students in class V is 83, and the minimum score is 16. The following data on the numeracy test results is presented in the table below.

Table 4. Numeracy Test Result Data

Categories of Numeracy	Many students	Percentage (%)
Very High	4	83%
High	3	66%
Medium	3	50%
Low	7	33%
Very Low	1	16%

Based on the data above, four learners obtained a very high level of numeracy skills, getting a percentage of 83%. Learners with high and medium numeracy levels were three children, with a percentage of 66% for high levels and 50% for medium levels. As for students with low numeracy levels, there are seven students with a percentage of 33%, and students with very low numeracy levels, one child is getting a percentage of 16%. The numeracy skills of fifth-grade students of SDN Kesenden are mostly in the low category based on the numeracy test data. As for the average value achievement on each indicator of numeracy skills, the following is obtained.

Table 5. Data on the Average Percentage of Numeracy Test Results

Indicator	Percentage (%)	Category Numeracy Skills
1. Using various kinds of numbers and symbols related to basic mathematics to solve problems in various contexts of daily life	50%	Medium
2. Using mathematical reasoning in problem-solving and communicating.	52%	Medium
3. Selecting and applying appropriate and simple problem-solving strategies, and presenting situations.	52%	Medium
Total	51%	Medium

The results of the calculation of the percentage of data from the numeracy test results from each indicator show that the first indicator obtained a percentage of 50%, which means that students have a moderate level of ability. For the second indicator, a percentage of 52% is obtained, which means that students get a moderate level of ability, and for the third indicator, a result of 52% is obtained, which means that students get a moderate level. Thus, the acquisition of the level of numeracy skills of students from all indicators is 51%, which means that the level of numeracy skills at SDN Kesenden is in the moderate category.

Based on the findings of researchers through the results of the numeracy test, it was found that the average test achievement of grade V students at SDN Kesenden was at a moderate level, namely 51.5. The test results of students are then grouped into five categories, namely: Very High, High, Medium, Low, and Very Low (Asrul et al., 2014). The analysis of the answers to solving students' numeracy problems based on the categories and indicators of numeracy skills is as follows:

Problem Number 1

In test question number 1, there are 2 indicators, namely:

1) Use numbers and symbols related to basic mathematics to solve problems in daily life contexts.
2) Use mathematical reasoning to solve problems and communicate them.

The students are considered to have met the indicators if they can use numbers and symbols related to basic mathematics in daily life and use mathematical reasoning in resolving problems and communicating them. Using numbers of mathematical symbols here, students can understand the price of the product and the amount of money they have in the story problem and calculate the percentage of discount that will be obtained, while reasoning is that students can choose the right amount of price with the money they have in the problem and determine the discount that is appropriate for the money they have. The following are the results of the answers of participants in the medium category:

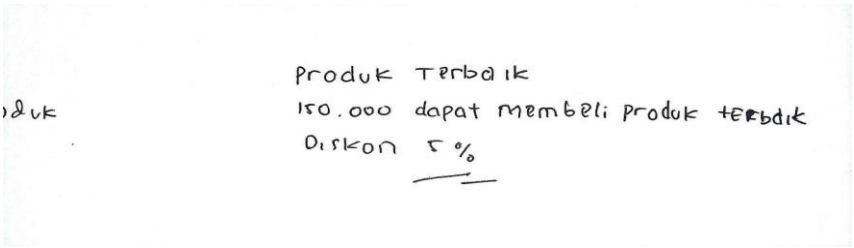

Figure 1. Answers of moderate category students

Based on the results of the analysis of numeracy skills in the moderate category, there are three learners out of 18 children. Figure 1 above is one of the mistakes in the answers of students in the moderate category when working on problem number 1 through indicators of using various kinds of numbers and symbols related to basic mathematics to solve problems in various contexts of daily life, and indicators of using mathematical reasoning in solving problems and communicating them. In this answer, students have not been able to do proper

reasoning and division regarding the amount of the price with the money they have in the problem and determine the appropriate discount with the money they have. Learners mention the answer to the best product for Rp. 100,000.00 per item with a 5% discount if they buy 3 items, while the money they have in question is only Rp. 150,000.00. It can be stated that students in the moderate category still have difficulty understanding basic numbers in everyday life, doing mathematical reasoning about percentage discounts, and dividing the money they have by the price presented in the problem. This is similar to what was found (Fitria et al., 2021) Moderate-level students have difficulty understanding basic numbers to solve problems in various contexts of everyday life. Thus, it can be concluded that students with a moderate numeracy category have not fulfilled the indicators of numeracy ability to use various kinds of numbers and symbols related to basic mathematics to solve problems in various contexts of daily life and use mathematical reasoning in solving problems and communicating them.

Problem Number 2

In test question number 2, there are indicators, namely: using mathematical reasoning to solve problems and communicate them and analyzing information in various forms (graphs, tables, charts, diagrams, etc).

Learners are declared capable of meeting indicators if they can use mathematical reasoning to solve and communicate problems. The reason is that students can determine the decomposition of disposable fertilizers and choose the right argument or opinion regarding the combination of data on the decomposition time of organic fertilizers and inorganic fertilizers. The following are the results of the answers of participants with very high categories:

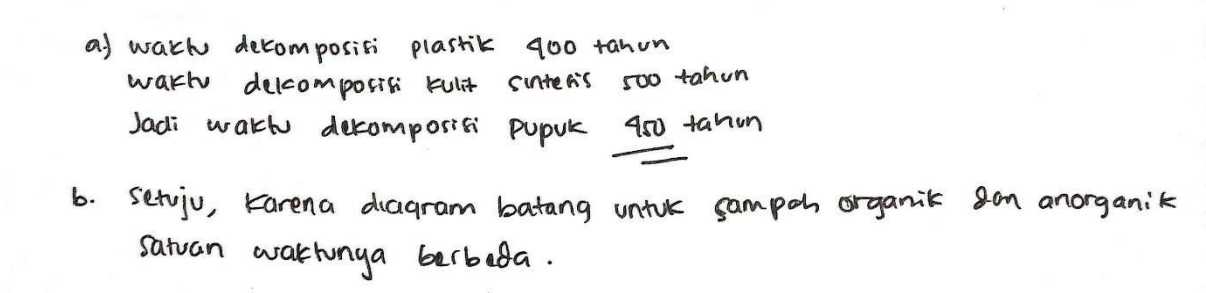

Figure 2. Answers from very high-category students

Based on the results of the analysis of numeracy skills in the very high category, there are four learners out of 18 children. Figure 2 above is one of the answers of students with a

very high category in answering question number 2. The error in answering the question is, in part, that students have not been able to about the decomposition time of disposable fertilizers. The answer explained that the decomposition time of plastic is 400 years, and for synthetic leather is 500 years. In the question, it has been explained that the decomposition of disposable fertilizer is longer than that of plastic but less than that of synthetic leather. As for answer b, students have been able to reason in solving the problems contained in the problem. According to (Muharomah et al., 2023), students have difficulty answering story problems because they have not read and understood the information in the problem carefully enough. In this case, students are said not to analyze the content of the questions, and understand the tables and bar charts carefully, so that students have difficulty in answering numeracy questions (Santi et al., 2024). Thus, it can be concluded that learners with very high numeracy ability category have not fully achieved the numeracy ability indicators of using mathematical reasoning to solve problems and communicate them and analyzing information in various forms (graphs, tables, charts, diagrams, etc) (Hadi & Suhendra, 2025).

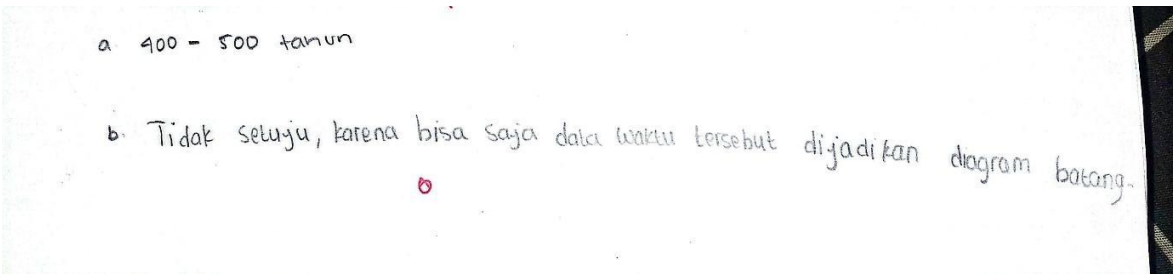

Figure 3. Answers from high-category students

Based on the results of analyzing the ability of numeracy in the high category, there are three learners out of 18 children. Figure 3 above is one of the answers of students in a high category. The error in answering the question is in part b, students as not been able to reason in solving the problem displayed in the problem. The table and bar chart presented in the problem state that the decomposition time in the two tables is different, which means that the two decomposition results in organic and inorganic fertilizers can't be combined or put together because they have different time frames. In this case, the student was unable to carefully analyze the unit of time presented in the table and bar chart, leading to difficulty in solving the problem. Furthermore, the student revealed they were slightly misled by the teacher's statement included in the question, causing them to lack precision in understanding

the overall problem. This is consistent with the findings of (Maulida, 2023) who reported that students in the high category still experience difficulty understanding concepts and analyzing facts within the presented problems. Thus, it can be concluded that students in the high numeracy literacy category have not yet fully met the indicators for applying mathematical reasoning to solve and communicate problems, nor the indicators for analyzing information presented in various formats such as graphs, tables, charts, or diagrams.

Problem number 3

In test question number 3, there are indicators, namely: choosing and applying appropriate and simple problem-solving strategies and being able to present the situation. Learners are declared capable of achieving these indicators if they can choose a strategy appropriately in problem solving, and can present the situation. In solving problems, students must be able to use an appropriate strategy to solve a problem. In formulating the strategy, students must have critical thinking skills and be careful in reading the problem and understanding the picture or story presented in the problem, to draw the right conclusion in solving the problem. In this problem, students must be able to determine the right and simple inference strategy to solve the problem in the problem. In this problem, students must be able to determine the right and simple inference strategy to solve the problem in the problem. The following are the results of the answers of participants in the low category:

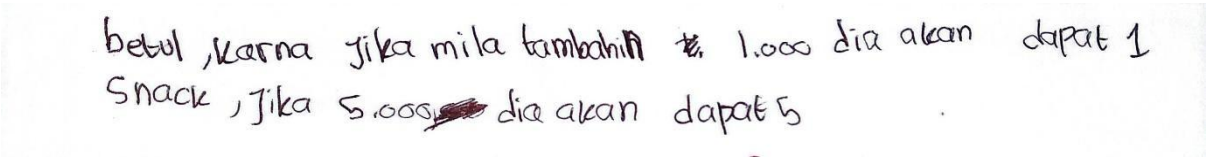

Figure 4. Answers of low-category learners

Based on the results of the analysis of numeracy skills in the low category, there are seven learners out of 18 children. Figure 3 above is one of the acquisition of low-category learners' errors in working on question number 3. The error is in the conclusion and reasoning when answering numeracy questions. Learners write that if they buy 700g D milk and add Rp. 5,000.00, they will get 5 snacks during the “Add a little to get a lot” promo period, whereas, as stated in the Anugrah Shop food brochure, the discount can be used if they buy 700g D milk. It can be said that students have not been careful in concluding, understanding the contents of the problem, and reading the situation, and students still have difficulties and cannot determine the right strategy for solving numeracy problems (Dewanti & Muna, 2023). Thus, it can be inferred that students with low numeracy category have not been able

to achieve the numeracy indicators of choosing and applying appropriate and simple problem-solving strategies and being able to present the situation.

Figure 5: Answers of very low-category students

Based on the results of the numeracy test of students in the very low category, there is one student out of 18 children in class V SDN Kesenden. Figure 5 above is the answer to question number 3 from students in the very low category. Due to not being able to read, learners have difficulty answering the questions presented. Learners have difficulty in terms of literacy because they have not been able to read long sentences or in the form of paragraphs. From the discussion with the fifth-grade homeroom teacher, it was found that this child lacked support and encouragement from parents in terms of learning to read. In addition, the homeroom teacher also stated that this child tends to be ignorant and engrossed in his world.

To overcome this, teachers conduct additional reading guidance during breaks or after school, but in this case, not only must teachers be able to encourage students, but parents must also supervise and guide their children in terms of encouraging literacy skills, especially in reading and understanding the contents of texts or questions. This is to the findings (Dewi, 2019), the active involvement of parents in reading activities with their children or having positive interactions during reading activities will be beneficial in fostering children's interest in reading and supporting optimal academic achievement. Based on the words of Allah ta'ala (QS. Luqman: 13-19)

“And (remember) when Luqman said to his son when he was instructing him: 'O my son...'” This verse shows how a father actively dialogues with, advises, and mentors his son. This is a strong argument for the importance of active parental involvement, including in activities such as reading, which contain learning and moral values. Therefore, students in the low numeracy category have not achieved the numeracy indicators in selecting and applying appropriate and simple problem-solving strategies, and being able to present the situation.

In research, the analysis of the mean achievement scores of each indicator is corroborated by students' answers that show difficulties in doing numeracy questions. The analysis results show that some students face difficulties when working on numeracy questions for each indicator. This is because students have difficulty interpreting the

information in the problem, so it is said that students are not careful in understanding the problem (Santi et al., 2024). The homeroom teacher also stated that 1:4 students in class V have been able to understand and determine how to solve problems in story problems, while those who face difficulties in determining the solution to numeracy problems are 3:4. (Sudirman et al., 2018) Stated that the obstacles experienced in answering a story problem are because they have not been careful and thorough enough to read and analyze the questions appropriately, and students have difficulty in interpreting what they see, reading, asking questions, and correctly solving story problems.

In addition, some learners were found to be proficient in working on story problems correctly in reasoning and analyzing new information contained in story problems in the form of tables and graphs, but in conclusion, they were still wrong. It can be seen from Figure 2 that learners with very high categories still have difficulty in drawing the right conclusions. This can happen because students do not understand and analyze the problem carefully. (Fauzi et al., 2021) stated that students have difficulty analyzing and answering questions correctly because they do not read carefully and understand the question first. Analyzing information is very important to answer numeracy questions, as reading and understanding questions allow students to answer questions more optimally.

Numeracy is a very important skill that provides a foundation for students to face future challenges (Setiyani et al., 2022). Literacy skills will help learners deal with problems in everyday life, both when they shop or when analyzing information, ideas, or problems they face in more depth, so that learners can draw conclusions and solve problems appropriately. (Iasha et al., 2024) Stated that the strength of numeracy will make it easier for learners to interpret mathematical concepts and overcome various problems in life. Thus, developing numeracy will greatly assist learners in contributing effectively to life (Dahlia et al., 2024). Therefore, essential to instill and foster numeracy, especially in the world of education, because this ability is very necessary for students. In this context, a teacher must be proficient in preparing, planning, and developing learning that can encourage and facilitate students to master their abilities, especially in numeracy and literacy..

CONCLUSION

Based on the results and discussion that have been described regarding the numeracy skills of students in mathematics learning in class V SDN Kesenden, it shows that numeracy indicators have not been achieved optimally. It can be concluded that the level of numeracy skills of grade V students is in the moderate category, as seen from the answers of all 18

students. In the first indicator, namely using numbers and basic mathematical symbols to solve problems in everyday life, a percentage of 50% is obtained, which means that students' numeracy skills in the first indicator are in the moderate category. In the second indicator, namely using mathematical reasoning in solving problems and communicating them, a percentage result of 52% can be interpreted as the numeracy skills of students in the moderate category. And for the third indicator, namely selecting and applying appropriate and simple problem-solving strategies, and being able to present the situation, obtaining a percentage of 52%, which means that the numeracy skills of students are in the moderate category. Therefore, based on the results of this research, a teacher must be able to design learning that focuses on encouraging students' numeracy skills and carry out habituation to students in working on varied questions so that skills and accuracy in analyzing questions can increase. Teachers should also encourage students to apply mathematical concepts in real-life situations by facilitating critical thinking skills and developing mathematical problem-reading skills that are important to be the foundation in facing the future.

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