PROFILE OF STUDENTS' NUMERACY LITERACY ABILITY AND SELF EFFICACY IN MATHEMATICS LEARNING

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Abstract. This study aims to describe the ability of numeracy literacy and mathematical self-efficacy of students in learning mathematics. This research is a descriptive study with a quantitative approach conducted at SMPN 34. The research instruments used are numeracy literacy test questions and self-efficacy questionnaires that have met the criteria for good instrument feasibility. The data analysis technique used is Descriptive Analysis. The results showed that overall the numeracy literacy skills of the students included in the criteria were not good. There are 73.30% or 20 people of the total number of students who have not been able to solve the numeracy literacy test questions correctly. Furthermore, the overall mathematical self-efficacy of students is included in the moderate criteria with a percentage of 70% or 21 students. Next for numeracy literacy skills in terms of mathematical self-efficacy (high, medium, and low), each has different numeracy literacy skills. Students whose self-efficacy is high, have good numeracy literacy skills, while students whose self-efficacy is moderate and low, have poor numeracy literacy skills. From the results of this study, it is necessary to research to improve the numeracy literacy skills and mathematical self-efficacy of students at SMPN 34 Pekanbaru.
Keywords: *Numeracy Literacy, Self-Efficacy, Math Learning*

1. INTRODUCTION

Numeracy literacy is the ability to apply number concepts and numeracy skills in daily life and the ability to interpret quantitative information found around us, this ability is reflected in familiarity with numbers and the practical ability to apply math skills in everyday life [1]–[5]. The same thing is explained [6] numeracy literacy is the knowledge and skills to use various numbers and symbols related to basic mathematics to solve practical problems in various daily lives, and analyze information presented in various forms (graphs, tables, charts, etc.) and interpret the results of the analysis to predict and make decisions. So it can be concluded that numeracy literacy skills are very important to be mastered by all students. Numeracy literacy skills make a real contribution to life, students who have good numeracy literacy skills will make students able to make decisions and develop their mindset. If students are able to apply numeracy literacy skills, it will have an impact on the quality of Indonesian education. If students have mastered numeracy literacy skills, then understanding and learning outcomes will be achieved well. Each student masters different numeracy literacy skills, so the ability to solve a problem will

also be different, so the better the numeracy literacy skills of students, the students can solve a problem well too [7], [8].

In solving a problem is not only influenced by cognitive factors, but also affective factors. One of the affective factors is self-efficacy or self-confidence in one's abilities. Self-efficacy is the level of confidence or trust in the ability to overcome difficulties or solve a problem [9]–[14]. Self-efficacy has a very important motivational effect on student learning outcomes and achievement in mathematics. [15] state that self-efficacy will affect a person's actions, efforts, perseverance, and flexibility to realize goals so that self-efficacy often determines the results before action occurs. Students who have high self-efficacy will make students have motivation, seriousness and perseverance in doing tasks [16]–[18]. Conversely, students who have low self-efficacy will make students avoid tasks because they feel the task is difficult, and make students quickly give up on the challenges or obstacles they face.

Based on the above problems, it is important to examine more deeply the numeracy literacy skills and self-efficacy of students, especially in solving a mathematical problem because the competence of numeracy literacy is a fundamental competency and emphasizes thinking competence or one's ability to use reasoning. While self-efficacy as one of the affective factors that help students in solving problems.

2. RESEARCH METHOD

The purpose of this study is to quantitatively describe the numeracy literacy skills and self-efficacy of students. So the type of research that will be carried out is descriptive quantitative. Quantitative research is research on certain circumstances with a quantitative presentation and descriptive approach [19]. The subjects in this study were students of class VIII8 SMPN 34 Pekanbaru which amounted to 30 people. This research instrument is in the form of numeracy literacy test questions and a self-efficacy questionnaire. The test questions consisted of 3 items that represented 3 indicators of numeracy literacy with grouping criteria of Very Good, Good, Good Enough, and Poor. The test questions have been tested for feasibility and have a reliability of 0.83 with a high category. Furthermore, each item is tested for validity. The 3 items can be said to be valid because the correlation value of the question is obtained more than 0.5 Indicators of numeracy literacy skills used in this study can be seen in Table 1 below.

Table 1. Indicators of Numeracy Literacy Skills Used by Researchers

No.	Indicators of Numeracy Literacy Skills
1	Formulate the situation mathematically: able to identify mathematical aspects and variables, able to simplify the problem, and solve the problem
2	Apply mathematical concepts, facts, procedures, and reasoning: able to apply concepts, facts, procedures, mathematical structures, manipulation of numbers and data.
3	Interpret, apply, and evaluate mathematical results: able to explain mathematical results or conclusions rationally.

The self-efficacy questionnaire consists of 35 statements representing 7 indicators with a Likert scale, namely for each answer is Strongly Agree, Agree, Disagree, and Strongly Disagree. This questionnaire has been tested for feasibility and has a reliability of 0.92 with a very high category. Furthermore, each statement in the questionnaire was tested for validity. Of the 35 statement items, it can be said that all are valid. Indicators of self-efficacy used in this study can be seen in Table 2 below.

Table 2. Indicators of Self-Efficacy Used by Researchers

No.	Indicators of Numeracy Literacy Skills
1	Able to overcome the problems faced
2	Confident of his/her success
3	Dare to face challenges
4	Dare to take risks
5	Realizing their strengths and weaknesses
6	Able to interact with others

Data collection was carried out by distributing questionnaires and questionnaires to the research sample. Descriptive analysis will be used in this study, with the help of Microsoft Excel. Analysis and interpretation of data obtained from test questions and questionnaires are as follows [20]

$$N = \frac{R}{SM} \times 100\%$$

Description:

N: Percentage sought
R: Score obtained
SM: Maximum score

The criteria for grouping students' numeracy literacy skills can be seen in the following table

Table 3. Criteria for Grouping Numeracy Literacy Skills

Interval	Criteria
$85 < N \leq 100$	Very Good
$70 < N \leq 85$	Good
$55 < N \leq 70$	Fairly Good
$N \leq 55$	Not Good

The criteria for grouping student self-efficacy can be seen in the table as follows

Table 4. Group for classifying students' Self Efficacy

Score Interval	Group
$x \geq \bar{x} + stdev$	High
$\bar{x} - stdev \leq x < \bar{x} + stdev$	Medium
$x < \bar{x} - stdev$	Low

Source: [21]

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3. RESULTS AND DISCUSSION

3.1 Results

Students' Numeracy Literacy Skills

Data from the student numeracy literacy test was obtained based on test sheets that had been given to students on June 20, 2023. After all the data was collected, the researcher immediately analyzed the test sheets that had been given to students with the following details:

Table 5. Descriptive Analysis of Students' Numeracy Literacy Skills

Numeracy Literacy Criteria	Number of Subjects	Percentage (%)
Very good	0	0%
Good	1	3,33%
Fairly Good	7	23,33%
Not Good	22	73,33%
Total	**30**	**100%**

Source: *Researcher Processed Data*

From the results that have been presented, it is obtained that the majority of students are included in the poor criteria. And there were no students who had numeracy literacy skills with very good criteria. Furthermore, the researchers analyzed the data on the results above. The results of the analysis of numeracy literacy skills based on indicators can be seen in the following table.

Table 6. Results of Analysis of Numeracy Literacy Skills Based on Indicators

Numeracy of Literacy Indicator	Score		Criteria
	$\bar{x}$	%	
Formulate situations mathematically, namely the ability to identify mathematical aspects and variables, be able to simplify problems, and solve problems	1,3	32,5%	Good Less
Applying mathematical concepts, facts, procedures, and reasoning, namely the ability to apply concepts, facts, procedures, mathematical structures, manipulate numbers and data.	1,67	41,75%	Good Less
Interpret, apply, and evaluate mathematical results, namely the ability to explain mathematical results or conclusions rationally	2,4	60%	Good enough

Source: *Researcher Processed Data*

Based on the information in the table, it is known that the numeracy literacy indicator with the highest average score is the indicator of interpreting, applying, and evaluating mathematical results with good enough criteria and an average score of 2.4. This shows that students are better able to interpret, apply, and evaluate mathematical

results than formulate situations mathematically, or apply mathematical concepts, facts, procedures, and reasoning. The numeracy literacy indicator with the lowest average score is formulating situations mathematically with poor criteria and an average score of 1.3. This shows that students' abilities are still classified as very weak and need to be improved in formulating situations mathematically

Student's Self-Efficacy

Data from student self-efficacy is obtained based on a questionnaire that was given to students on June 20, 2023. After all the data is collected, the researcher immediately analyzes the questionnaire sheet that has been given to students. The results can be seen in Table 7.

Table 7. Descriptive Analysis of Student Self-Efficacy

Self Efficacy	**High**	**Medium**	**Low**	**Sum**
	$x \geq (\bar{x} + SD)$	$(\bar{x} - SD) < x < (\bar{x} + SD)$	$x \leq (\bar{x} - SD)$	
	$x \geq 112$	$89 < x < 112$	$x \leq 89$	
Frequency	4	21	5	**30**

Source: *Researcher Processed Data*

Based on the table above, of the 30 students who filled out the self-efficacy questionnaire, it was found that 13.33% of students were in the high self-efficacy category, 70% of students were in the moderate self-efficacy category, and 16.66% of students were in the low self-efficacy category or other words, the majority of students were in the moderate self-efficacy category.

Students' Numeracy Literacy Ability Based on Students' Self-Efficacy

Each student has different cognitive abilities and affective abilities. This study examines students' numeracy literacy skills based on students' self-efficacy. The results of the analysis of the numeracy literacy test sheet and self-efficacy questionnaire that has been given to students can be seen in the following details.

Table 8. Analysis of Literacy Skills Based on Self-Efficacy

Level of Self-Efficacy	**Average Score**			**Average**	**Percentage (%)**	**Criteria**
	1	**2**	**3**			
High	2,75	2,75	3	2,83	70,83	Good
Medium	1,33	1,8	2,29	1,8	45,16	Good Less
Low	0	0	2,4	0,8	20	Good Less

Source: *Researcher Processed Data*

Based on the data presented in the table, it is obtained that students' numeracy literacy skills in terms of self-efficacy at each level of self-efficacy have different numeracy literacy skills. The highest average score was obtained by the group of students with high self-efficacy of 2.83. The second highest score was obtained by the student group with moderate self-efficacy of 1.8. While the lowest average was obtained by the

student group with low self-efficacy of 0.8. Furthermore, the researchers analyzed the data on the results above. The results of the analysis of numeracy literacy skills based on indicators can be seen in the following table.

Table 9. Analysis of Percentage Results of Numeracy Literacy Skills Based on Self-Efficacy for Each Indicator

No	Numeracy of Literacy Indicator	Maximum Score	Level of *Self-Efficacy*					
			High		Medium		Low	
			$\bar{x}$	%	$\bar{x}$	%	$\bar{x}$	%
1	Formulate situations mathematically, namely the ability to identify mathematical aspects and variables, be able to simplify problems, and solve problems	4	2,75	68,75	1,33	33,25	0	0
2	Applying mathematical concepts, facts, procedures, and reasoning, namely the ability to apply concepts, facts, procedures, mathematical structures, manipulate numbers and data.	4	2,75	68,75	1,8	45	0	0
3	Interpret, apply, and evaluate mathematical results, namely the ability to explain mathematical results or conclusions rationally	4	3	75	2,29	57,25	2,4	60
Average			**2,83**	**70,83**	**1,8**	**45,16**	**0,8**	**20**
Numeracy Literacy Category			**Good**		**Good Less**		**Good Less**	

Source: *Researcher Processed Data*

Based on the table above, it can be seen that students with high self-efficacy can have fairly good numeracy literacy skills related to formulating situations mathematically, namely the ability to identify mathematical aspects and variables, be able to simplify problems and solve problems with an average of 2.75 out of a maximum score of 4 or 68.75%. In the ability to apply mathematical concepts, facts, procedures, and reasoning, the ability to apply concepts, facts, procedures, mathematical structures, and manipulation of numbers and data, students with high self-efficacy also do not have good enough ability with an average of 2.75, from a maximum score of 4 or 68.75%. While the ability to interpret, apply, and evaluate mathematical results, namely the ability to explain

mathematical results or conclusions rationally, students with high self-efficacy already have good numeracy literacy skills with an average of 3 out of a maximum score of 4 or 75%.

Students with moderate self-efficacy have less ability related to formulating situations mathematically, namely the ability to identify mathematical aspects and variables, be able to simplify problems and solve problems with an average of 1.33 out of a maximum score of 4 or 33.25%. In the ability to apply mathematical concepts, facts, procedures, and reasoning, namely the ability to apply concepts, facts, procedures, mathematical structures, and manipulation of numbers and data, students with moderate self-efficacy also do not have a good enough ability with an average of 1.8 of the maximum score of 4 or 45%. While the ability to interpret, apply, and evaluate mathematical results, namely the ability to explain mathematical results or conclusions rationally, students with moderate self-efficacy have a fairly good ability with an average of 2.29 out of a maximum score of 4 or 67.25%.

Students with low self-efficacy have very poor abilities related to formulating situations mathematically, namely the ability to identify mathematical aspects and variables, be able to simplify problems and solve problems with an average of 0 out of a maximum score of 4 or 0%. In the ability to apply mathematical concepts, facts, procedures, and reasoning, namely the ability to apply concepts, facts, procedures, mathematical structures, and manipulation of numbers and data, students with low self-efficacy also have very poor abilities with an average of 0 out of a maximum score of 4 or 0%. While the ability to interpret, apply, and evaluate mathematical results, namely the ability to explain mathematical results or conclusions rationally, students with low self-efficacy have a fairly good ability with an average of 2.4 out of a maximum score of 4 or 60%.

3.2 Discussion

The research findings show that overall the average numeracy literacy skills of SMPN 34 Pekanbaru students are classified as poor, which is 73.33%. This ability can be seen according to indicators, namely in the indicator of formulating situations mathematically, namely the ability to identify aspects and mathematical variables, able to simplify problems and solve problems has a percentage of 32.5%, the indicator of applying mathematical concepts, facts, procedures, and reasoning, namely the ability to apply concepts, facts, procedures, mathematical structures, manipulate numbers and data has a percentage of 41.75% and in the indicator of interpreting, applying, and evaluating mathematical results, namely the ability to explain mathematical results or conclusions rationally has a percentage of 60%. In this study, the indicator with the lowest score was on the indicator of formulating the situation mathematically, namely the ability to identify mathematical aspects and variables, being able to simplify the problem.

This is in line with research [22] on analyzing the ability of grade VIII students to solve numeracy literacy problems. Based on research students have difficulty in

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simplifying information about what is known and asked. As for students' self-efficacy, the research findings show that the majority of students' self-efficacy has moderate self-efficacy with a percentage reaching 70%. The results of the study when viewed from the numeracy literacy skills of students based on student self-efficacy show that the research subjects in completing the numeracy literacy ability test produced answers with diverse solutions. The diversity of problem-solving on the material of the system of linear equations of two variables is due to several factors, one of which is student self-efficacy [23]. By the statement [24]–[26] one of the factors that contribute to the success of students in understanding mathematics well is self-efficacy. This is expressed in research conducted by [27], [28], stating that there is a significant relationship between numeracy literacy skills and student self-efficacy. The effect of self-efficacy on numeracy literacy is 45.3%.

Therefore, it is important to know students' self-efficacy. Based on the results of self-efficacy questionnaire data processing from 7 indicators, researchers can classify and conclude that students with high self-efficacy can overcome problems, believe in their abilities, dare to make decisions, and dare to face challenges. This can be seen from the results of the data obtained showing that the indicators of being able to face the problems faced, believing in their success, daring to face challenges, and daring to take risks and decisions are higher than other indicators. [8], [29], [30] Stating that students' self-efficacy helps students in performing numeracy literacy performance.

4. CONCLUSION

From the research and data analysis that has been carried out, several conclusions can be drawn, namely: The results showed that overall the numeracy literacy skills of the students included in the criteria were not good. There are 73.30% or 20 people of the total number of students who have not been able to solve the numeracy literacy test questions correctly. Furthermore, the overall mathematical self-efficacy of students is included in the moderate criteria with a percentage of 70% or 21 students. Next for numeracy literacy skills in terms of mathematical self-efficacy (high, medium, and low), each has different numeracy literacy skills. Students whose self-efficacy is high, have good numeracy literacy skills, while students whose self-efficacy is moderate and low, have poor numeracy literacy skills.

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