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Research Article

Profile of elementary school students' numerical literacy ability

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ABSTRACT

One of the impacts of the Covid-19 pandemic is the decline in numerical literacy skills due to learning loss. This study aims to describe the numerical literacy abilities of students at SDN Grogol and SDN Grabagan Sidoarjo. This research is quantitative descriptive research with a data collection technique in the form of a numerical literacy test based on the Minimum Competency Assessment (AKM) which is accessed on the Pusmenjar website with 20 questions in the form of complex multiple choice, multiple choice, matching and true false. Data analysis uses descriptive statistics which include the average of numerical literacy scors and the percentage of students who answered correctly for each indicator. Based on the research results, it can be concluded that the numerical literacy skills of students at SDN Grogol are in the medium category with an average score of 43.67. Meanwhile, the numerical literacy skills of students at SDN Grabagan are still low with an average score of 35.33. Furthermore, the answers to the numerical literacy test of students at SDN Grogol and SDN Grabagan have similarities in the indicator that most students answered correctly, namely indicator 7, understanding whole numbers which includes number symbols, the concept of place value, and generalization, 70% at SDN Grogol and 62% at SDN Grabagan. Meanwhile, the indicator that has the highest error is indicator 6, namely knowing the standard units of length/distance, weight and time with a percentage of students answering correctly of 30% at SDN Grogol and 23% at SDN Grabagan.

Keywords: Elementary School; Numerical literacy skills; Mathematics Learning; Mathematics Teaching

1. INTRODUCTION

The Covid-19 pandemic that emerged in Indonesia since March 2020 has had a profound effect on all sectors of people's lives including the education sector. As a result, every educational institution must facilitate online learning while still presenting effective and fun teaching and learning activities for students. However, when learning is carried out online many problems are encountered, one of the problems that arises is a decrease in the quality of learning both in the process and in the results including a decrease in students' literacy and numeracy skills (Siskawati et al., 2020). This data is strengthened by the results of the PISA survey, which shows that Indonesia consistently ranks in the bottom ten in terms of mathematical literacy scores (Wahyu Adinda et al., 2022; Yuliana et al., 2023).

Enzelina et al., (2022) said that literacy is a skill in reading and writing, regardless of context and who acquires these skills. While numeracy is the ability to apply the concept of numbers and arithmetic operations in everyday life. Furthermore, as stated by Atsila & Setyawan (2021) numerical literacy is the skill in applying various types of symbols related to basic mathematics and then analyzing the data obtained for interpretation in decision making. Agreeing with the above, Rasdiyanti et al., (2023) and Siahaan et al., (2022) define numerical literacy as the ability or skill in reasoning, applying concepts, predicting, measuring and interpreting data in the form of numbers and mathematical rules in understand and solve a problem. Thus, it can be concluded that numerical literacy ability is the ability to solve everyday problems by applying mathematical concepts that are owned in interpreting existing data and information for decision making.

Numerical literacy skills are needed in all aspects of life. High numerical literacy skills can encourage better understanding and development of science and technology. This can then help students in making the right decisions. As one example of the importance of numerical literacy, it can be seen in the application of the concept of multiplication in life. For example, in the case of administering medication doses prescribed by a doctor, the rule of administering medication is two times three per day versus three times two per day, even though mathematical calculations produce the same amount, it will certainly have a different impact on the patient if there is an error in understanding the written instructions. Thus,

students' numerical literacy skill is an important thing that needs attention, especially for students at the elementary school level.

Several studies related to numerical literacy skills at the elementary school level have been carried out, including research by Wahyu Adinda et al., (2022) at SDN Mentokan, which shows that students' basic numeracy skills still need to be improved. Rasdiyanti et al., (2023) also conveyed similar results regarding the numerical literacy skills at SDN Riominsi, which are still relatively low. Various efforts have been made by the government to improve numerical literacy skills, one of which is by implementing the Minimum Competency Assessment (AKM) by the Ministry of Education and Culture and encouraging the numerical literacy program through the Kampus Mengajar program. However, the AKM results for most elementary school students are still at a moderate level of mathematical literacy (Nurhanifa et al., 2021). This is supported by the results of observations made by researchers at SDN Grogol and SDN Tulangan Sidoarjo which are one of the target schools for the Kampus Mengajar where the average student numerical literacy ability is still low due to learning loss during the pandemic where students carry out online learning during the pandemic approximately three years. Lack of practice on AKM problems at school also affects students' numerical literacy scores (Noviantini et al., 2023). In addition, the literacy culture in schools and the School Literacy Movement (GLS) are not implemented properly, resulting in low students' numerical literacy scores (Rakhmawati & Mustadi, 2022).

Based on the background above, the researcher intends to conduct research that aims to describe the numerical literacy skills of elementary school students based on AKM problems. In contrast to previous studies, the numerical literacy problems given in this study were taken from the Pusmenjar website. This description focuses on students' numerical literacy abilities for each indicator given in the AKM problems. The description of students' numerical literacy abilities in each of these indicators can then be used as a reference for teachers in providing appropriate scaffolding so that in the future students' low numerical literacy abilities can be improved.

2. RESEARCH METHOD

This research is a quantitative descriptive study which aims to describe students' numerical literacy abilities. The subjects of this research were fifth grade students at SDN Grogol and SDN Grabagan Sidoarjo, each consisting of 30 students. In this study, data collection was carried out through a numerical literacy test on the website www.pusmenjar.kemdikbud.go.id with a total of 20 questions in the form of complex multiple choice, multiple choice, matching, and true false. The numerical literacy ability measured consists of 8 indicators as follows

Table 1. Numerical Literacy Indicators

No	Indicators	Cognitive Level
1	Solve simple equations using multiplication/division operations	Algebra
2	Recognize simple number patterns and continue those patterns	Algebra
3	Use addition/subtraction/multiplication/division of whole numbers, calculate the square of a whole number, and estimate the results of operations	Number
4	Understand fractions and positive mixed fractions with one- or two-digit denominators	Number
5	Calculate the perimeter and area of a rectangle if the length and width is known, and calculate the length or width if the area/ perimeter and one of its sides is known	Number
6	Get to know the standard units for length/distance, weight, and time	Number
7	Understand whole numbers including number symbols, place value concepts, and generalizations	Number
8	Comparing two fractions, including comparing fractions and whole numbers	Number

Furthermore, the data obtained from the numerical literacy test was analyzed using descriptive statistics including the average of numerical literacy and the percentage that answered correctly in each indicator.

3. RESULTS AND DISCUSSION

This research was conducted at SDN Grogol and SDN Grabagan with the aim to describe students' numerical literacy skills based on AKM problems on the Pusmenjar website. The results of the numerical literacy test for fifth class students at SDN Grogol and SDN Grabagan Sidoarjo are presented in the following description.

Numerical Literacy Ability at SDN Grogol

Based on the results of the numerical literacy test at SDN Grogol, the following results were obtained.

Table 2. Numerical Literacy Scores of SDN Grogol Students

Numerical Literacy Scores	Frequency	Mean
10	2	**43,67**
20	2	
25	2	
30	3	
35	2	
40	3	
45	5	
50	2	
55	1	
60	2	
65	3	
70	2	
85	1	

The average of numerical literacy score for students at SDN Grogol is 43.67 on a scale of 100 with the lowest score is 10 and the highest is 85. The average score for numerical literacy for students at SDN Grogol is in the medium category based on Susanto et al. (2023) where students' numerical literacy abilities are in the interval 40 to 60. These results are in accordance with research by Nurhanifa et al. (2021) who stated that the AKM results of elementary school students were mostly at a medium level of numerical literacy. Furthermore, the results of the numerical literacy test were analyzed based on the numerical literacy indicators as follows.

Table 3. Percentage of Correct Answers Based on Numerical Literacy Indicators at SDN Grogol

No	Indicators	Percentage of Correct Answers
1	Solve simple equations using multiplication/division operations	47%
2	Recognize simple number patterns and continue those patterns	40%
3	Use addition/subtraction/multiplication/division of whole numbers, calculate the square of a whole number, and estimate the results of operations	43%
4	Understand fractions and positive mixed fractions with one- or two-digit denominators	37%
5	Calculate the perimeter and area of a rectangle if the length and width is known, and calculate the length or width if the area/ perimeter and one of its sides is known	39%
6	Get to know the standard units for length/distance, weight, and time	30%
7	Understand whole numbers including number symbols, place value concepts, and generalizations	70%
8	Comparing two fractions, including comparing fractions and whole numbers	37%

Based on **Table 3,** students at SDN Grogol still make a lot of mistakes on indicator 6 that is recognizing standard units for length/distance, weight, and time where the percentage of students answering correctly is only 30%. Furthermore, indicators 4 and 8 which relate to understanding and comparing fractions are also relatively low where only 37% of students answered correctly. From these results it can be explained that students still have difficulty in solving fraction problems. This difficulty could be caused by students still having difficulty in basic division operations as the results of research conducted by Cahayani et al. (2022) where on the numeracy test students had difficulty doing division arithmetic operations. In third place, students made many mistakes on indicator 5 that is calculating the perimeter and area of a rectangle with a percentage of correct answers of 39%. Furthermore, on indicator 2 40% students answered correctly in recognizing and continuing number patterns. In indicator 3, in using whole number operations, students answered correctly at 43%, followed by indicator 1 that is students' ability to solve simple equations at 47%. The indicator that has the highest percentage of students answering correctly is indicator 7, namely understanding whole numbers with 70% of students answering correctly. As the results of research by Cahayani et al. (2022) which states that the average student is able to operate basic arithmetic operations on whole numbers.

Numerical Literacy Ability at SDN Grabagan

Based on the results of the numerical literacy test at SDN Grabagan, the following results were obtained.

Table 4. Numerical Literacy Scores of SDN Grabagan Students

Numerical Literacy Scores	Frequency	Mean
5	**1**	**35,33**
15	**4**	
20	**2**	
25	**6**	
30	**4**	
35	**1**	
40	**1**	
45	**3**	
50	**3**	
55	**1**	
60	**2**	
75	**2**	

In Table 4, the average of numerical literacy score of SDN Grabagan students is 35.33 on a scale of 100 with the lowest score is 5 and the highest is 75. This score is in the low category where student scores are in the interval of 20 to 40 (Susanto et al., 2023). The low level of students' numerical literacy can be caused by students' understanding of the material, the quality of learning in classroom, students' motivation in working on AKM problems, and the time students have in learning mathematics (Umam, 2023). In addition, AKM that are presented in word problem is difficult for students because students tend not to like reading long questions and if they have difficulty they tend to guess answers without thinking (Pearce et al., 2011; Phonapichat et al., 2014). Furthermore, the results of the numerical literacy test were analyzed based on the numerical literacy indicators as follows.

Table 5. Percentage of Correct Answers Based on Numerical Literacy Indicators at SDN Grabagan

No	Indicators	Percentage of Correct Answers
1	Solve simple equations using multiplication/division operations	43%
2	Recognize simple number patterns and continue those patterns	30%
3	Use addition/subtraction/multiplication/division of whole numbers, calculate the square of a whole number, and estimate the results of operations	24%
4	Understand fractions and positive mixed fractions with one- or two-digit denominators	32%
5	Calculate the perimeter and area of a rectangle if the length and width is known, and calculate the length or width if the area/ perimeter and one of its sides is known	33%
6	Get to know the standard units for length/distance, weight, and time	23%
7	Understand whole numbers including number symbols, place value concepts, and generalizations	62%
8	Comparing two fractions, including comparing fractions and whole numbers	35%

Based on Table 5, it can be explained that the numerical literacy abilities of SDN Grabagan students can be seen from the percentage of students who answered correctly based on eight numerical literacy indicators. The indicator where many students make mistakes is indicator 6, that is recognizing standard units for length/distance, weight, and time where only 23% of students answered correctly. In second place, namely indicator 3, students still have difficulty using whole number operations where only 24% of students answered correctly. These results are in accordance with the research of Cahayani et al., (2022) which stated that out of the ten students not a single student was able to answer the division arithmetic operation questions. In third place, students answered 30% correctly on the indicator of recognizing and continuing simple number patterns. Furthermore, indicator 4 in understanding fractions students answered correctly by 32% which was then followed by calculating the circumference and area by 32% and comparing the two fractions by 35%. The last indicator

where the most students answered correctly was indicator 6 in understanding whole numbers where as many as 62% of students answered correctly.

4. CONCLUSION

Based on the results of the study it can be concluded that the numerical literacy skills of students at SDN Grogol are in the medium category with an average score of 43.67. Meanwhile, the numerical literacy skills of students at SDN Grabagan are still low with an average score of 35.33. Furthermore, from the answers to the students' numerical literacy test at SDN Grogol and SDN Grabagan, they have in common the indicator that most students answered correctly, namely indicator 7 understanding whole numbers which includes number symbols, the concept of place value, and generalization by 70% at SDN Grogol and 62% at SDN Grabagan. Meanwhile, the indicator with the highest error was indicator 6, namely knowing the standard units of length/distance, weight, and time with the percentage of students answering correctly by 30% at SDN Grogol and 23% at SDN Grabagan.

CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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