THE ABILITY OF GRADE VIII STUDENTS' MATHEMATICAL LITERACY IN TERM OF GENDER

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Abstract

This study aims to describe the effect of gender on the math literacy skills of junior high school students. This research is qualitative research using a descriptive approach. The main subject of this research is the shape of the flat side. The subjects of this study were 2 students, one male student and one female student in each category of high and low mathematical literacy. The data collection technique used a mathematical ability literacy test in the form of essay questions. The data analysis technique is by looking at the test results seen from the high and low categories. The results showed that the male subject only met the first indicator of mathematical literacy ability, namely formulating a situation mathematically. For the second and third indicators, male subjects are less able to use mathematical concepts and explain appropriate solutions when solving problems. The female gender subject fulfills two indicators of mathematical literacy ability, namely the indicator of formulating a situation mathematically (formulate) and the indicator of using mathematical concepts, facts, procedures, and reasoning. For the third indicator, female gender subjects are less able to interpret and use reasoning in solving problems in the questions.

Keywords: mathematical literacy ability, gender

1 INTRODUCTION

Education is a school's effort to influence children and adolescents so that they have well-developed skills and are fully aware of their social relationships and tasks. One of the important knowledge in education is mathematics [1]. Mathematics is one of the subjects that has been taught in schools, which aims to help students prepare themselves so that they are able to deal with changing conditions in life and in a world that is constantly developing, through actions based on logical, rational and critical thinking [2]. Mathematics has been taught at all levels of education, from the lowest education to the highest. The purpose of learning mathematics in schools is more emphasized on the arrangement of reasoning, the basis for forming attitudes, and skills in applying mathematics.

Many factors influence learning mathematics, one of which is gender. Male and female students have different characteristics in terms of intelligence, emotions and will [3]. These gender differences not only give rise to these differences, but also give rise to differences in the way of acquiring mathematical knowledge. Male students tend to be more interested in studying mathematics compared to female students. In learning mathematics students need not only numeracy skills, but also logical and critical reasoning skills to solve problems that are not merely problems in the form of routine questions but more to everyday problems. The ability referred to here is mathematical literacy ability.

Mathematical literacy is important to help students understand the role of mathematics in everyday life [3]. In this case, a student who is literate in mathematics will definitely know which concepts are relevant to the problem at hand. Mathematical literacy is the ability to formulate, apply, and interpret mathematics in various contexts, including mathematical reasoning and the use of concepts, procedures, and facts to describe, explain, or predict phenomena [4]. Preliminary observations in this study indicated that most of the eighth grade students had difficulties in working on math literacy questions related to everyday life. In the learning process, female students tend to be more active and diligent, while male students tend to be more passive and lack self-confidence. The learning outcomes of some male and female students show similarities, but overall mathematical literacy skills are still not good. Based on this, researchers are interested in conducting research with the title "Mathematical literacy skills of Grade VIII students in terms of gender". This research will describe the mathematical literacy abilities of class VIII students based on gender.

2 METHODOLOGY

This research is a type of qualitative research with descriptive research methodology. This research produces descriptive data in the form of written and spoken words from people and behavior that can be observed, because the results in this research are a depiction of actual situations and conditions. In this research, the researcher acts as the main instrument so that he can interact directly with respondents to determine their abilities in answering the test questions given. The data collection techniques used were tests. The mathematical literacy ability test was carried out in class VIII C of SMP Negeri 4 Tegal City with 28 students as respondents consisting of 13 male students and 15 female students. After the test was carried out, the results were grouped into high, medium and low categories because students' mathematical literacy abilities were different, both in terms of mastery of the material and its application. Many students tend to be confused in determining a systematic way to solve problems, especially when the questions are different from the examples given by the teacher during the learning process. The indicators of mathematical literacy ability based on Maulida (2018) which will be used in this study are three indicators, namely:

a. Formulate the situation mathematically (formulate).

b. Using mathematical concepts, facts, procedures, and reasoning.

c. Interpret, apply, and evaluate mathematical results.

Determine students' mathematical literacy abilities as high, medium and low abilities as follows [5]:

a. If the student meets all the indicators then the student is in the high mathematical literacy ability category where all the indicators are met.
b. If a student meets two indicators then the student is in the category of moderate mathematical literacy ability.
c. If a student only meets one indicator then the student is in the low mathematical literacy ability category.

In this research, the categories used are high and low mathematical literacy ability categories to make it easier to describe students' mathematical literacy abilities based on gender. The subjects in this research were 2 students, each consisting of 1 male subject and 1 female subject for each category of mathematical literacy ability. Next is drawing conclusions about the description of mathematical literacy skills based on gender.

3 RESULTS

This research was conducted in class VIII C, totaling 31 students in the 2022/2023 academic year. Of the 31 students who took the mathematical literacy skills test, 28 students were 13 male students and 15 female students. The results of this research were obtained based on the achievement of students' mathematical literacy indicators for the high and low ability categories. The following are the results of the classification of mathematics literacy abilities of class VIII C students in terms of gender.

Table 1. *Mathematical Literacy Ability Classification Results*

Category	Gender	Code	Amount
High	Male	F-03, F-21	2
	Female	F-13, F-15	2
Low	Male	F-18, F-25, F-31, F-10, F-07, F-18, F-23, F-28, F-30	9
	Female	F-01, F-05, F-08 F-03, F-04, F-08, F-14	7

Based on this table, it can be seen that based on the achievement of the indicators on the mathematical literacy questions that have been given, there are more male and female students in the low mathematical literacy ability category than those in the high mathematical literacy ability category. Where male students with low mathematical literacy ability category totaled 9 people and female students totaled 7 people. The results of research subject achievement are shown in the following table:

Table 2. Research Subject Achievement Results

No	Subject Code	Indicators Of Mathematical Literacy Ability		
		I_1	I_2	I_3
1.	LKT	H	H	H
2.	LKR	H	-	-
3.	PKT	H	H	H
4.	PKR-2	-	H	-

Information :

LKT : High Category Male Subject

LKR : Low Category Male Subjects

PKT : High Category Female Subject

PKR : Low Category Female Subject

I.1 Indicator 1, Formulate the situation mathematically (formulate)

I.2 Indicator 2, Using mathematical concepts, facts, procedures and reasoning

I.3 Indicator 3, Interpret, apply and evaluate mathematical results

H: fulfilled

- : not fulfilled

Based on the results of the research that has been done, the mathematical literacy abilities of students in class VIII C in solving mathematical literacy ability test questions on the material of flat sided spaces in the form of descriptions, the following discussion is obtained:

3.1 Male gender mathematical literacy abilities

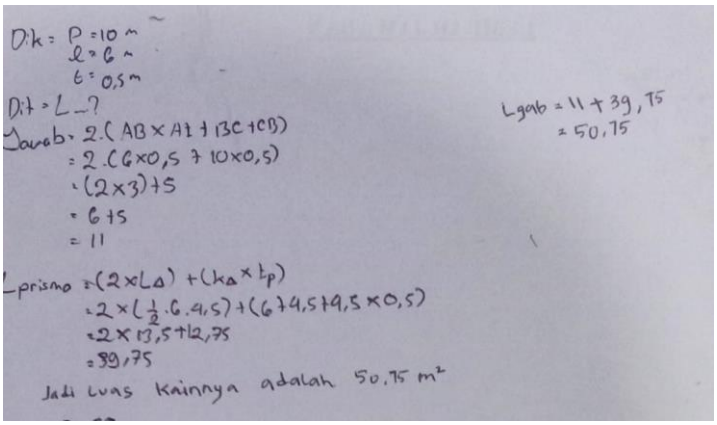

Figure 1. The answer is the male subject in the high category

Figure 1 is the answer of male students in the category of high mathematical literacy. It can be seen in the picture that the subject is able to formulate information according to the problem in the question by writing what is known and asked in full on the answer sheet. Where the subject writes the length, width and height in mathematical language, namely p, l, and t. Based on these answers it can be concluded that the LKT subjects fulfill the indicators of formulating situations mathematically (formulate).

LKT subjects are able to use concepts and strategies that suit the problem, where finding the area of the tent fabric is the area of the beam without cover and base plus the area of the triangular prism by looking for them one by one. However, in entering numbers into the formula and calculating, the student's answers were still wrong. Nonetheless, it can be concluded that the LKT subjects met the indicators using mathematical concepts, facts, procedures, and reasoning.

The LKT subjects were able to interpret the problem solving on the questions well, and were able to write a conclusion on the final result of the answer but it was still not quite right. So it can be concluded that the LKT subjects fulfill the indicators of interpreting, applying, and evaluating mathematical results.

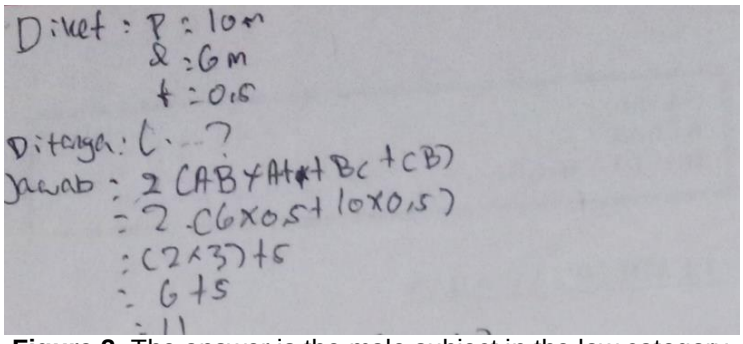

Figure 2. The answer is the male subject in the low category

Figure 2 shows the answers of male students in the category of low mathematical literacy abilities. In figure 2, the LKR subject shows that the subject is able to formulate the situation in the problem by writing it simply in mathematical language, namely by using the symbols p, l, and t to write down the information available to make it simpler to answer. Although it is still incomplete in writing the information on the questions. Based on Figure 2, it can be concluded that the LKR subject meets the indicators of formulating the situation mathematically (formulate).

LKR subjects were unable to use the correct mathematical concepts in solving them because they only wrote formulas without providing a description of the formulas for what formulas to look for. The subject does not know what strategy can be used to solve the problem. So it can be concluded that LKR subjects cannot fulfill the indicators using mathematical concepts, facts, procedures, and reasoning.

LKR subjects were unable to interpret the correct solution to solve the problem. The subject also felt confused about how to solve this problem. Therefore, LKR subjects are unable to interpret and reason about the solution. The LKR subject also seemed unable to complete it, this was seen by the subject only answering until calculating the area of the beam, not arriving at a conclusion. So it can be concluded that the LKR subject does not meet the indicators for interpreting, applying and evaluating mathematical results.

In other words, based on the results of the analysis that has been carried out, it can be concluded that the male subject meets the indicators of mathematical literacy ability, in which the subject writes down what is known, asked, and answered when answering questions to make it easier to solve problems. This is in line with research that has been conducted, that subjects with male gender in solving questions are able to identify several important mathematical aspects of the given problem and are able to simplify the problem so that it is easy to analyze mathematically [6].

For indicators using mathematical concepts, facts, procedures, and reasoning, male subjects still experience difficulties in applying and using available data on questions in compiling steps to be used in the problem solving process. This is not in line with research states that male students appear to be able to determine the steps for completion and draw conclusions about the math literacy ability test questions correctly [7].

For indicators of interpreting, applying, and evaluating the results of mathematics, male subjects were less able to interpret the problems in the questions, where male students were less thorough and kept too much silence during the work process. So students are less able to evaluate solutions based on interpreted solutions. This is not in line with research states that the ability of male students to solve mathematical literacy questions is able to interpret and recognize problem solving that requires drawing conclusions and to be able to provide explanations and communicate problem solving based on argumentation [8].

3.2 Female gender mathematical literacy abilities

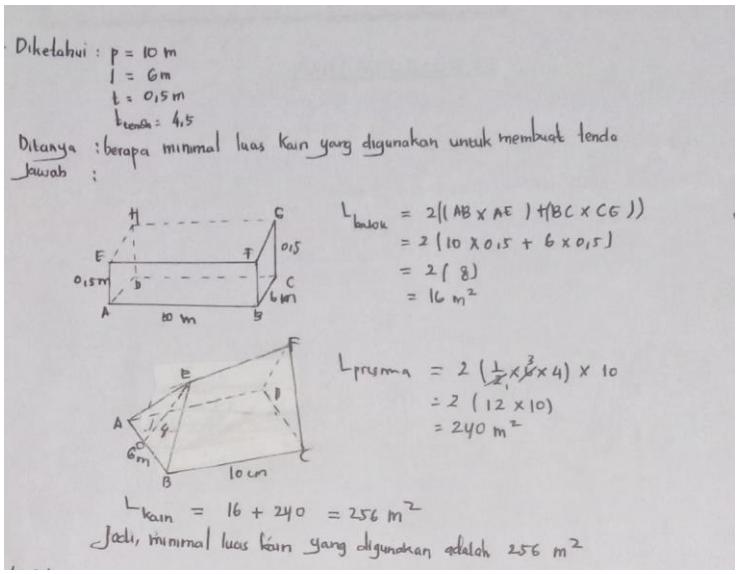

Figure 3. The answer is a female subject in the high category

Figure 3 shows the answers of female students in the category of high mathematical literacy abilities. It can be seen in the picture that students are able to formulate information according to the problem in the question by writing what they know and what they are asking about on the answer sheet in detail and accompanied by pictures which make it easier to solve the problem. Based on these answers, it can be concluded that the PKT subject meets the indicators of formulating the situation mathematically (formulate).

The PKT subject is able to apply appropriate mathematical concepts in solving problems, it can be seen that the subject is able to write down the steps in a coherent manner. This is because the subject understands mathematical concepts and appropriate problem solving strategies, namely by using the formula for a beam without a lid and base, as well as the formula for the area of a triangular prism without a base. So it can be concluded that the PKT subject meets the indicators of using mathematical concepts, facts, procedures and reasoning.

PKT subjects are able to use their reasoning in solving problems, where PKT subjects are able to write clearly how to solve problems. The PKT subjects also checked their answers again and wrote down the conclusions of the results obtained even though they were not quite right. So it can be concluded that the subject meets the indicators of interpreting, applying and evaluating mathematical results.

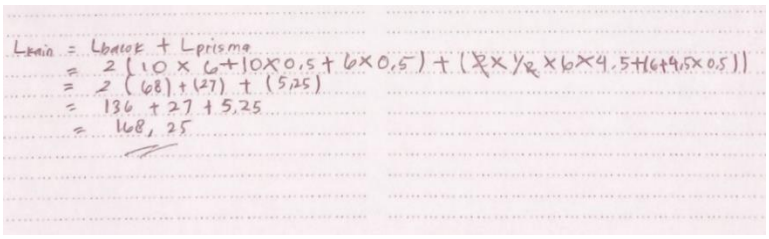

Figure 4. The answer is a low category female subject

Figure 4 shows the answers of female students in the category of low mathematical literacy abilities. It can be seen in Figure 4 that the PKR subjects were unable to write down the information in the questions in mathematical language to make it simpler. Based on these answers, the subject does not meet the indicators of formulating the situation mathematically (formulate).

PKR subjects were unable to use mathematical concepts in solving problems. It was seen that PKR-2 subjects calculated the area of a block with a lid and base, where the formula for the area of a block that should be used is without a lid and base. So it can be concluded that the PKR subject does not meet the indicators of using mathematical concepts, facts, procedures and reasoning.

The PKR subject was able to interpret the correct solution in solving the problem because he added up the area of the beam as the base of the tent and the area of the prism as the roof of the tent, so it could be concluded that the PKR subject met the indicators for interpreting, applying and evaluating mathematical results.

Based on the results of the analysis that has been carried out on students with high and low categories of mathematical literacy ability, it can be concluded that female students in the indicator of formulating mathematically (formulate) are quite capable of writing down the information they know and asking questions before solving them to make problem solving easier. Based on this explanation, it is in line with statement which states that female students in solving mathematical literacy questions are able to state the information they know and ask about from the questions [9].

Indicators of using mathematical concepts, facts, procedures and reasoning, female students are able to apply appropriate steps according to existing problems and are not afraid of making mistakes in the steps taken when solving problems. Even though the final results of the calculations are still not precise, the mathematical concepts applied are appropriate to the problem at hand. This is in line with research that female students are able to use concepts, facts and procedures that are appropriate and lead to solutions [10]. This is also in line with explains that women are superior in accuracy, thoroughness, thoroughness and thoroughness of thinking [11].

Indicators of interpreting, applying and evaluating the mathematics results of female students are not being able to interpret solutions to solve existing problems, not re-checking the solutions that have been used and not writing down the conclusions of the results obtained. With this, the subject of female gender did not arrive at the final result of the answer. So this research is not in line with research that female students have mastered indicators of mathematical literacy skills in interpreting mathematics to solve problems[12].

4 CONCLUSIONS

Based on the results of the analysis and discussion of the mathematical literacy abilities of class VIII C students at SMP Negeri 4 Tegal City, it can be concluded that in general the male gender meets only one indicator of mathematical literacy abilities, namely the first indicator, formulating situations mathematically (formulate). Meanwhile, for the second and third indicators, only male gender subjects with high mathematical literacy abilities fulfill the category. This is due to the fact that male gender subjects in the low mathematical literacy category category cannot use mathematical concepts and interpret appropriate solutions to solve problems. In general, the female gender fulfills two indicators of mathematical literacy abilities, namely the first indicator is formulating situations mathematically (formulate); and the second indicator uses mathematical concepts, facts, procedures, and reasoning. This is due to the fact that the female gender subject focuses too much on one question, which causes the female gender subject to not reach the final answer. This difference shows the potential to improve mathematical literacy skills for both gender groups, with male students needing to focus on understanding concepts and interpreting solutions, while female students need to learn to be more diverse in solving various types of problems.

ACKNOWLEDGEMENTS

First of all, I would like to thank Allah SWT who has made it easy for me to compile this article, my second thanks to my parents and family who always pray for and support me in compiling this article to completion. Next, I would like to thank Mr. M. Shaefur Rokhman, M.Si and Ahmadi S.Pd., supervisor who always gives direction during the research process to the preparation process, and I would like to thank all those who have always prayed for, helped and encouraged me all this time preparation of this article. And thanks to the principal of SMP Negeri 4 Tegal City for allowing me to do research.

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