

Description of Students' Mathematical Problem Solving Ability on Flat Build Material Based on Gender Class VIII Mts Ar-Rahman Kaju

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Abstract

This research is a qualitative research with descriptive attachment that aims to determine the description of students' mathematical problem solving abilities on flat building material based on Class VIII MTs Ar-Rahman Kaju Gender which is compiled based on indicators of problem solving ability, namely indicator understanding problems, planning solutions, solving problems and re-examining. The data obtained were the results of interviews with 2 male students and 2 female students. The data collection methods used were observation, interviews and problem-solving ability tests. The results in this study showed that female students were better at solving matima problems than male students. It can be seen from this study that female students completed all four indicators of mathematical problem solving ability, while male students were only able to complete two of the indicators of mathematical problem solving ability.

Keywords: *problem-solving ability, flat material, gender.*

Abstrak

Penelitian ini merupakan penelitian kualitatif dengan pendekatan deskriptif yang bertujuan untuk mengetahui deskripsi kemampuan pemecahan masalah matematika siswa pada materi bangun datar berdasarkan Gender Kelas VIII MTs Ar-Rahman Kaju yang disusun berdasarkan indikator kemampuan pemecahan masalah yaitu indikator memahami masalah, merencanakan penyelesaian, menyelesaikan masalah dan memeriksa kembali. Data yang diperoleh merupakan hasil wawancara dengan 2 siswa laki-laki dan 2 siswa perempuan. Metode pengumpulan data yang digunakan adalah observasi, wawancara dan tes kemampuan pemecahan masalah. Hasil dalam penelitian ini menunjukkan bahwa siswa perempuan lebih baik dalam memecahkan masalah matematika dari pada siswa laki-laki. Dapat dilihat dari penelitian ini bahwa siswa perempuan menyelesaikan keempat indikator kemampuan pemecahan masalah matematika, sedangkan siswa laki-laki hanya mampu menyelesaikan dua dari indikator kemampuan pemecahan masalah matematika.

Kata Kunci : kemampuan pemecahan masalah, materi bangun datar, gender.

INTRODUCTION

Mathematics is known to students as a subject that must be taught in schools, because mathematics learning is a global subject that is very influential on the progress of science and technology. The role of mathematics is taken into account because being a servant of scientific disciplines, can train higher-order thinking skills. As well as mathematics fighting important in forming skills of thinking creatively, critically, logically, and able to work together. Learning in the classroom must consider problem-solving abilities, so that students can easily solve the material taught.

The problem of low ability to solve students' mathematical problems includes that students do not understand the problems given, because of students' habits in doing routine problems (Sriwahyuni & Maryati, 2022). In addition, there are some students who can understand the problem and are able to do according to the steps given, but do not re-check the answer results, resulting in incorrect

or incorrect answer results. This is according to the statement (Elita et al., 2019) that students find it difficult to solve story problems, make solving steps, ask questions, and solve given problems.

Problem solving is important in mathematics learning because problem solving can build students' confidence in solving a mathematical problem. According to (Putri et al., 2019) Problem solving is a process of overcoming difficulties found to achieve the desired goal. In addition, students who have the ability to solve math problems, he will be able to improve decision making in his life. So that the ability to solve mathematical problems possessed by students and problem solving techniques are more logical and structured. Solving a mathematical problem, each student has different obstacles in doing a material in learning mathematics.

Material in learning mathematics that is classified as important is geometry material. Because basically geometry has a greater

chance of being understood by students compared to other branches of mathematics. Because the idea of geometry has been known by students since before they entered school, for example lines, planes and space. However, there are still many students who are constrained in learning geometry. Although geometry has been taught, the field shows that geometry material is still not liked by most students (Matappa & Bone, 2018). One of the geometry materials studied at the SMP/MTs level is flat building material. A flat build is an object that is two-dimensional and bounded by curved lines or straight lines. Because flat building is a two-dimensional building, so it only has a length and width. Flat build only has area and circumference.

Many factors must be considered in learning mathematics, in addition to solving mathematical problems, an equally important factor is the gender factor of students (*Gender*). Difference *Gender* It certainly causes physiological differences and affects psychological differences in learning. So that male and female students certainly have many differences in learning mathematics. Difference *Gender* In education can be influential in determining student learning outcomes due to differences *Gender* can affect psychological learning (Amelia, 2017). Men and women have many differences that can affect the ability to solve mathematical problems. From these differences, teachers are expected to be able to realize and pay attention that every *Gender* has different characteristics (Ayuni, 2018). Based on the above problem, researchers are interested in researching with the title "Description of students' mathematical problem solving abilities on flat-based building material *Gender* class VIII MTs Ar-Rahman Kaju".

Troubleshooting Capabilities

Problem-solving ability is the ability to solve non-routine problems based on basic knowledge and mentality in the process of solving the problem (Kurniawan et al., 2019)

Mathematical problem-solving ability according to (Harahap & Surya, 2017) is a skill possessed by students that makes them

think critically to solve problems related to mathematics in their lives.

Based on the definitions of problems according to experts, it can be concluded that the ability to solve mathematical problems is a complex cognitive activity, as a process to overcome a problem encountered and to solve it requires a number of strategies.

Mathematics

According to (Sari & Himmi, 2019) Mathematics is a science that is always relevant to everyday life, this is because every activity, way of thinking and human activity develops mathematics itself.

According to (Abror, 2022) Mathematics is an absolute science or an exact science, which is always related to life, ways of thinking and human activities, and always develops with these activities.

Menuru (Azizah & Abadi, 2022) Mathematics is a scientific discipline that underlies the development of other sciences and is always used and utilized in everyday life whether consciously or unconsciously.

Based on the definitions of mathematics according to the experts above, it can be concluded that mathematics is an exact science that is always related to everyday life that is able to awaken a person's ability to think logically.

Gender

According to (Nursyam, 2020) *Gender* are traits and behaviors attached to men and women that are socially and culturally shaped

According to (Nur & Palobo, 2018) *Gender* are attributes related to a person's gender, including behavioral roles that describe masculinity or femininity in a particular cultural context.

Understanding *Gender* according to Muhtar (Aulinah et al., 2020) that *Gender* It can be interpreted as social gender or societal connotation to determine social roles based on gender.

Based on the definitions of gender, according to experts, it can be concluded that gender is the difference in nature and behavior that appears between men and women, both personality and behavior in society.

RESEARCH METHODS

Types of Research

Based on the research objectives that have been set, this study uses a type of qualitative research with a descriptive approach.

Research Subjects

This research was conducted at MTs Ar-Rahman Kaju in class VIII starting from July 27 to September 1, 2023, where the research subjects consisted of 4 students of different genders, 2 boys and 2 girls who were selected based on recommendations by mathematics subject teachers.

Data Collection Procedure

The data collection procedure in this study will involve interviews as the main method. When conducting interviews, it is necessary to emphasize the importance of objectivity. Objectivity in this context refers to the relationship between the interviewer and the subjects involved in the research. The interview gives the subject the freedom to convey all information relevant to the matter under investigation, with the main aim of minimizing the interviewer's influence on the subject. In the interview, the interviewer must try as much as possible not to provide excessive assistance in answering the problems that the subject raises, both structurally and implicitly. This is done so as not to direct the subject to give answers that match the interviewer's expectations or provide clues that can affect the thinking process of the research subject.

Data Analysis Techniques

According to Miles and Huberman (Trisnowali, 2015) stated that the activities in qualitative research data analysis are carried out interactively and take place continuously until the data is complete.

The steps of data analysis between one another are interconnected with each other. These steps cannot be separated or done in order. In order to produce good data, researchers in analyzing data must be in accordance with existing steps. Furthermore, interactive models in data analysis according to Miles and Huberman, which are as follows:

Data Reduction, Data Display, Conclusion Drawing or Verification.

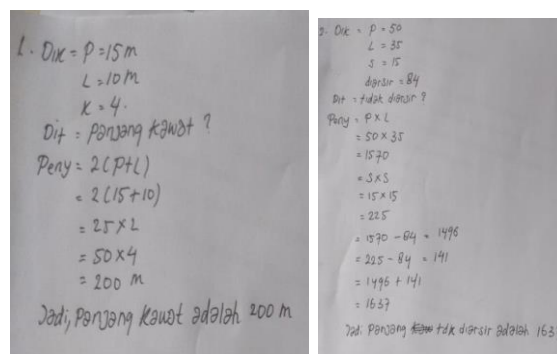
RESULTS AND DISCUSSION

Research Results

Based on the results of the analysis of students' mathematical problem solving skills on flat material based on *gender*, class VIII MTs Ar-Rahman Kaju is divided into 2 categories, namely men and women. Furthermore, the interview process was carried out and the test of students' mathematical problem solving skills was obtained:

Interviews and Tests in the first week

First male subject test results

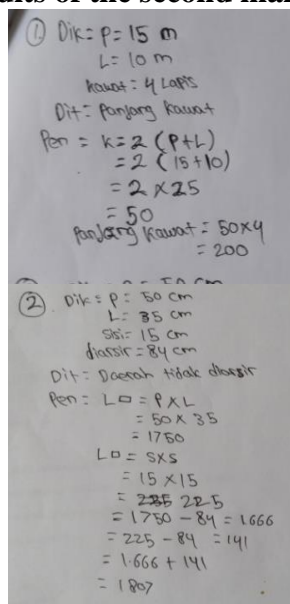


No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

No	Troubleshooting indicator question number two	Information
1	Understand the problem	The subject seems to

		understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject cannot solve the problem
4	Recheck answers	The subject seems unable to recheck the answer

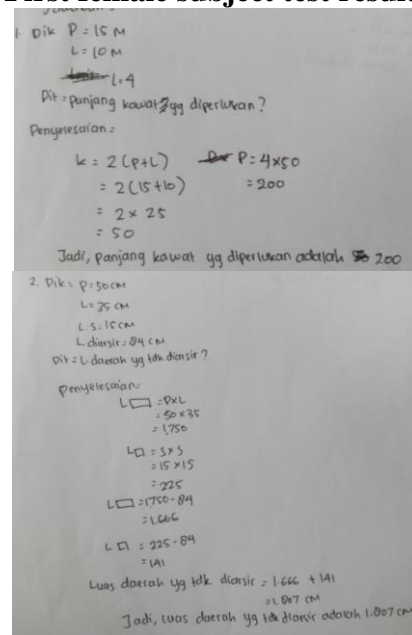
Test results of the second male subject



No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject seems unable to recheck the answer

No	Troubleshooting indicator question number two	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject seems unable to recheck the answer

First female subject test results



No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion

3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

No	Troubleshooting indicator question number two	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

Test results of the second female subject

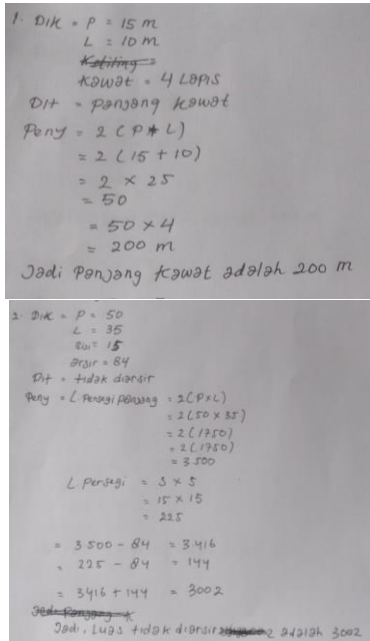
1) Dik : $p = 15 \text{ m}$
 $L = 10 \text{ m}$
 kawat : 4 lapis
 Dit : panjang kawat : ?
 penye : $k = 2 (p + l)$
 $= 2 (15 + 10)$
 $= 2 \cdot (25)$
 $= 50$
 panjang kawat : 50×4
 $= 200 \text{ m}$
 jadi panjang kawat yang dibutuhkan adalah : 200 m

2) Dik : $p = 60 \text{ cm}$
 $L = 35 \text{ cm}$
 $s = 15 \text{ cm}$
 daerah arsir : 84 cm
 Dit : Luas daerah yang tidak diarsir ?
 Luas persegi panjang : $p \times l$
 $= 60 \times 35 = 1.750 \text{ cm}^2$
 Luas persegi : $s \times s$
 $= 15 \times 15 = 225 \text{ cm}^2$
 Luas yang tidak diarsir : $Lpp - Lp - \text{arsir}$
 $= 1.750 - 225 = 1.525$
 $= 1.525 + 84$
 $= 1.609 \text{ cm}^2$
 jadi , Luas daerah yang tidak diarsir adalah 1.609 cm^2

No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

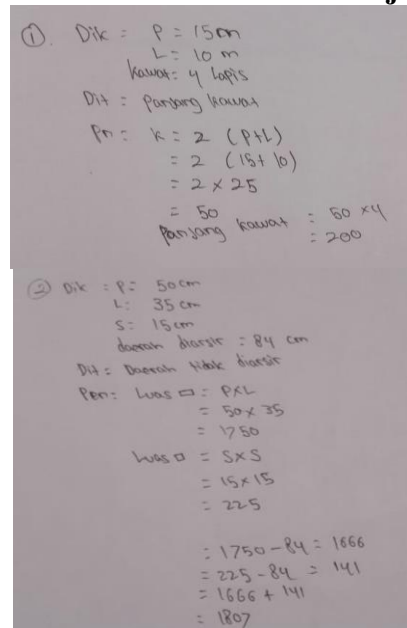
No	Troubleshooting indicator question number two	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject cannot solve the problem
4	Recheck answers	The subject seems unable to recheck the answer

**Interview and Test in the second week
 First male subject test results**



3	Resolve issues	The subject cannot solve the problem
4	Recheck answers	The subject seems unable to recheck the answer

Test results of the second male subject



No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject seems unable to recheck the answer

No	Troubleshooting indicator question number two	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion

No	Troubleshooting indicator question number two	Information

1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject seems unable to recheck the answer

First female subject test results

1. Dik = P = 15 m
 L = 10 m
 kawat = 4 Lapis
 Dit = Panjang kawat yg diperlukan?
 Penyelesaian =
 $k = 2(P+L)$
 $= 2(15+10)$
 $= 2 \times 25$
 $= 50$
 $p = 4 \times 50$
 $= 200$
 Jadi, panjang kawat yg dibutuhkan adalah 200.

2. Dik = P = 35 cm
 L = 50 cm
 S = 15 cm
 Dik = yg diarsir = 84 cm
 Dit = Luas daerah yg tdk diarsir?
 $L = P \times L$
 $= 35 \times 50$
 $= 1.750$
 $L = S \times S$
 $= 15 \times 15$
 $= 225$
 $= 1.750 - 84 = 1.666$
 $= 225 - 84 = 141$
 $= 1.666 + 141 = 1.807$
~~L daerah yg tdk diarsir = 1.807~~
 Jadi, luas daerah yg tdk diarsir adalah 1.807

No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem

4	Recheck answers	The subject can visibly recheck the answer
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No	Troubleshooting indicator question number two	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

Test results of the second female subject

1-> Dik = p = 15 m
 L = 10 m
 kawat = 4 Lapis
 Dit = Panjang kawat : ...?
 penye = $k = 2(P+L)$
 $= 2(15+10)$
 $= 2 \times 25$
 $= 50$
 Panjang kawat = 50×4
 $= 200$ m
 jadi panjang kawat yang dibutuhkan adalah : 200 m
 2-> Dik = p = 50 m
 L = 35 m
 s = 15 m
 daerah asir = 84 cm
 Dit = luas daerah yang tidak diarsir?
 Luas panjang persegi panjang = $P \times L$
 $= 50 \times 35 = 1.750 \text{ cm}^2$
 Luas persegi = $S \times S$
 $= 15 \times 15 = 225 \text{ cm}^2$
 Luas yang tidak diarsir = $LPP - DA + LP - DA$
 $= 1.750 - 84 + 225 - 84$
 $= 1.666 + 141$
 $= 1.807 \text{ cm}^2$
 Jadi, luas daerah yang tidak diarsir adalah 1.807 cm²

No	Question solving indicator number one	Information
1	Understand the problem	The subject seems to

		understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

No	Troubleshooting indicator question number two	Information
1	Understand the problem	The subject seems to understand the problem
2	Plan for completion	The subject can plan the completion
3	Resolve issues	The subject can solve the problem
4	Recheck answers	The subject can visibly recheck the answer

Discussion

Description of Mathematical Problem Solving Abilities of Male Gender Subjects

In this section, data analysis is carried out which aims to determine the ability to solve mathematical problems on flat material. The results of this analysis will contain conclusions as a form of answers to research problem formulations.

Based on the results of data analysis that has been carried out on subjects who are male in solving mathematical problems on the indicator of understanding the subject's problem, first read the problem repeatedly before the subject writes down information on the problem. The subject has been said to perform indicators of understanding the problem when knowing the information of the problem. The subject was seen writing down

what information was known from the questions on his work and mentioning the information he made at the time of the interview.

In the indicator of planning the completion of the subject, men are said to be able to plan the solution, in working on the problem, the subject is seen writing down the plan that is done, as well as in the interview processor, the subject can express a plan to be done on the problem.

The male subjects could not solve the problem of getting up flat. The subject is seen working on the completion using a formula from a rectangle and a square formula. However, in the processing of the work, the subject is wrong in using the area formula of the climbing square. Resulting in incorrect answers.

The subject has also re-examined the answers he finds and can explain them well in his own words. However, the answers found were wrong. Then the subject is said not to meet the indicators of re-checking and conclusions.

So from the above explanation, it can be concluded that male subjects can only solve two indicators of the four indicators of solving mathematical problems.

Description of Mathematical Problem Solving Skills of Female Gender Subjects

In this section, data analysis is carried out which aims to determine the ability to solve mathematical problems on flat material. The results of this analysis will contain conclusions as a form of answers to research problem formulations.

Based on the results of data analysis that has been carried out on subjects who are female in solving mathematical problems on the indicator of understanding the subject problem first, read the problem repeatedly before the subject writes down information on the problem. The subject has been said to perform indicators of understanding the problem when knowing the information of the problem. The subject was seen writing down what information was known from the questions on his work and mentioning the

information he made at the time of the interview.

In the indicator of planning the completion of the subject, women are said to be able to plan the solution, in working on the subject problem, it is seen to write down the plan that is carried out, as well as in the interview process, the subject can put forward a plan to be done on the problem.

Female subjects can also solve problems on flat wake problems. The subject is seen working on the solution by using formulas from rectangles and square formulas. Although at first the subject had the wrong answer results in the test in the first week, but in the second week of the test the subject seemed to be able to answer correctly the questions that had been done. So it can be concluded that the female subject has fulfilled the indicators of solving the problem.

The subject has also double-checked from the answers he finds and can explain them well in his own words. Seen in the results of the subject's work and interviews, the subject draws conclusions from the answers he finds and then writes those conclusions on the answer sheet.

So from the explanation above, it can be concluded that female subjects can solve all four indicators of solving mathematical problems.

Comparison of the description of mathematical problem-solving abilities of male-gendered subjects and female-gendered subjects

In this section, data analysis is carried out which aims to compare the ability to solve mathematical problems on flat building material. The results of this analysis will contain conclusions as a form of answers to research problem formulations.

Data obtained in the first week test, male subjects found 2 indicators out of 4 indicators, namely indicators of understanding problems and indicators of planning solutions. In the second week of the test, male subjects also only completed 2 indicators, namely the indicator of understanding the problem and the indicator of planning a solution. While the female subjects data obtained in the first week

test met 2 indicators, namely indicators of understanding the problem and incarnate planning for resolution. In the second week of the test, female subjects completed all 4 indicators of mathematical problem-solving ability.

Table 4.2 comparison of troubleshooting capabilities

Male subjects and female subjek

Indicators	Man	Woman
Underst and the problem	The subject can understand the problem	The subject can understand the problem
Plan for completion	The subject can plan the completion	The subject can plan the completion
Resolve issues	The subject cannot solve the problem	The subject can solve the problem
Re-examining and concluding	Subject Unable to Re-examine and Conclusion	Subject can Re-examine and conclude

From the results of the study, it was stated that the mathematical problem solving ability of female subjects was better than male subjects. This is in line with the results of research that has been conducted by (Annisa et al., 2021) which revealed that female students are superior in solving math problems than male students. And (Anisah & Sri Lastuti, 2018) said that the difference in solving mathematics problems of female students and male students is not too significant, the mathematical problem solving ability of female students with an average score of 57.68 while male students with an average score of 53.72. It can be said that female students are better than male students.

CONCLUSION

The results of this study showed that the mathematical problem solving ability of

female subjects was better than male subjects. This can be seen from the comparison of the mathematical problem solving ability of male subjects and female subjects in solving flat wake problems. The male subjects completed two problem-solving indicators: the understanding problem indicator and the plan resolution indicator. While the female subjects completed all four indicators of mathematical problem-solving ability.

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