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Students' Thinking Processes in Solving Mathematics Problems Based on Emotional Quotient

Rafika Kamila Sari[1*], Endah Budi Rahaju[2]

[1*,2] Study Program of Mathematics, State University of Surabaya, Surabaya, Indonesia

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***Corresponding author:**
Rafika.19035@mhs.unesa.ac.id

Abstract: Thinking process is a series of cognitive processes that occur in someone's mental and mind including the stages of remembering, considering, making arguments, and making decisions. Differences in students' thinking processes in solving math problems can be influenced by emotional quotient. This study uses three stages of the thinking process which include (1) Forming understanding, (2) Forming opinions, and (3) Forming conclusions, and using stages of problem solving according to Polya. The aim of this study is to describe the thinking processes of junior high school students with high and low emotional quotient in solving problems of flat side of space. This study is a qualitative descriptive study. This study was conducted on class VIII students of junior high school with the subject of one high emotional quotient student and one low emotional quotient student. The techniques of collecting the data were questionnaire, test, and interview. Data were analyzed based on problem solving indicators according to Polya and then interviews were conducted to find out the process of solving student problems when solving a given problem. The results of this study indicate that in the stage of understanding the problem, both students with high and low emotional quotient re-explain the contents of the given problem, determine what is known and what is asked in the problem, and choose information to use and information that is not used to solve the problem. In the stage of devising a plan, both students with high and low emotional quotient determine concepts related to the problem. Student with high emotional quotient determines more than one way of solving and choosing the method used to solve problems, while student with low quotient only knows one way of solving problems. In the stage of carrying out the plan, high emotional quotient students implement the steps according to the previously made settlement plan to obtain the final answer, while low emotional quotient students do not implement the steps to the end because she is unsure of the steps chosen. In the stage of looking back, student with high emotional quotient determines the final conclusion of the results, while student with low emotional quotient does not determine the final conclusion because she is not able to solve the problem.

INTRODUCTION

Learning mathematics is a process of providing learning experiences to students through a series of planned activities so that students gain competence regarding the mathematics material being studied (Sudiati, 2014). The purpose of learning mathematics is to develop the ability to: (1) Communication; (2) Reasoning; (3) Problem Solving; (4) Connection; and (5) Representation (NCTM, 2000:7). NCTM (2000:52) emphasizes the importance of

solving mathematics problems that problem solving is an integral part of learning mathematics, so that it must continue to be attached to learning mathematics. According to Wardhani (2008) problem solving is the process of applying previously acquired knowledge to new, unfamiliar situations. Polya (1973) explains that problem solving is an activity of finding the meaning sought until it can be understood clearly. Polya also revealed that there are four steps in solving math problems, namely: (1) Understanding the problem, (2) Making a problem solving plan, (3) Carry out the plan, and (4) Re-checking the answers. The opinion of Wardhani (2008) that students are said to be able to solve problems if they have the ability to understand problems, design mathematical models, complete models, and interpret the solutions obtained.

In solving a problem, students carry out a thought process in finding answers (Wahyu et al, 2019). In line with the opinion of Widyastuti (2015) that thinking processes in mathematics have an important role in answering mathematical problems. Rahaju (2014) defines thinking as an activity of finding true knowledge. Sudarman (2011) argues that thinking processes are all mental activities in transforming information into new knowledge. According to Suryabrata (2014), there are three steps to the thinking process, namely: (1) Forming understanding, (2) Forming opinions, and (3) Forming conclusions.

The teacher must know the students' thinking processes in solving problems so that they can achieve maximum results and the learning is in accordance with what was planned or in other words the learning is successful. The success of student learning cannot be separated from internal factors and external factors in students. One of the internal factors is motivation to learn. According to Siswono (2018), motivation is one of the factors that influence students' problem solving abilities. Motivation is contained in one aspect of emotional quotient, namely the ability of students to motivate themselves. Tanjung et al (2018) argued that the presence of emotion functionally has important value and correlates with student motivation. So that emotional quotient has a role in solving students' mathematical problems. In accordance with the opinion of Ningsih et al (2021) that emotions are a factor that influences the success of learning, especially in solving math problems. Research of Supriadi et al (2015) reveals that students with high emotional quotient are able to carry out all stages of problem solving, while students with low emotional quotient are not able to carry out all stages of problem solving.

According to Eva et al (2015), emotional quotient is the ability of students to control their own emotions so that they can complete a task well. Emotional quotient refers to a person's ability to recognize emotional meanings and relationships, and be able to find the right reasons to be able to solve the problem. Goleman (2005) divides emotional quotient into four main aspects, namely: (1) self-awareness, (2) self-regulation, (3) motivation, (4) empathy, and (5) social skills (Goleman, 2005). This research is reviewed from two levels of emotional quotient, namely high emotional quotient and low emotional quotient. This aims to determine a significant difference between students with high emotional quotient and students with low emotional quotient when they solve a

math problem. In accordance with the opinion of Goleman (1995) and Supardi (2015) who only stated the characteristics of individuals who have high and low emotional quotient. These two characteristics have significant differences. Students with high emotional quotient have the ability to empathize, relate socially, motivate themselves, be responsible, resistant to stress, optimistic, and able to solve problems (Wuwung, 2019). Whereas students with low emotional quotient are usually moody, give up easily, withdraw, shy, even afraid.

One of the most important parts of mathematics is Geometry. Exploring geometry helps to develop the ability to solve problems, geometry is used by most people in everyday life, and geometry is full of challenges and fun to solve it (Rizqiyani et al, 2017). Indrayany (2019) revealed that there were difficulties and low results were obtained by junior high school students when learning geometry material. In geometry there is material for flat side of space. Hasibuan (2018) revealed that many junior high school students had difficulties when solving flat sided space problems. The difficulties experienced by students were that students did not understand correctly in determining the surface area of cubes, beams, prisms, and pyramids.

This research is relevant to Supriadi's research (2015) entitled "Analysis of Students' Thinking Processes in Solving Mathematical Problems Based on Polya's Steps in View of the Emotional Quotient of Grade VIII Students of SMP Al Azhar Syifa Budi Academic Year 2013/2014" with the results of the study revealing that there are differences between students with high and low emotional quotient in solving mathematics problems. The difference between this research and Supriadi's research is that Supriadi's research uses three instruments, namely questionnaires, problem-solving tests, and interview guidelines. Meanwhile, this study used four instruments, namely questionnaires, mathematics ability tests, problem solving tests, and interview guidelines, a mathematics ability test, a problem solving test, and an interview guide.

Based on the background stated above, the research that will be conducted is entitled "Thinking Process of Junior High School Students in Solving Mathematics Problems Based on Emotional Quotient".

METHOD

This type of research uses a descriptive method with a qualitative approach. This research was carried out in a systematic and in-depth manner using scientific and holistic methods with the aim of understanding phenomena and social phenomena by providing clear explanations in the form of a series of words. The subjects in this study were 2 grade VIII junior high school students for the 2022/2023 academic year. The research subjects chosen were students with high and low emotional quotient scores, 1 person each. The data collection method used in this study are emotional quotient questionnaire, mathematical ability test, problem solving test, and interview. Data analysis included analysis of emotional quotient questionnaires, analysis of mathematical ability tests, and analysis of mathematical problem solving tests accompanied by interviews. Emotional quotient

questionnaire analysis was carried out to calculate the emotional quotient score for each grade VIII student who had filled out the questionnaire. Based on the results of these scores, students are grouped into three groups, namely groups of students with high, medium, and low levels of emotional quotient. The following are the score categories made by Azwar (2017) with the following formula:

$$Mean\ (\mu) = \frac{1}{2}(i_{max} + i_{min}) \qquad (1)$$

$$SD\ (\sigma) = \frac{1}{6}(x_{max} - x_{min}) \qquad (2)$$

Information:
i_{max} = maximum item score
i_{min} = minimum item score
x_{max} = subject's maximum score
x_{min} = subject's maximum score

Variable tendency levels are categorized into three types with the following conditions.

$test\ score \geq (\mu + 1.0\sigma)$: High (3)
$(\mu + 1.0\sigma) > test\ score \geq (\mu - 1.0\sigma)$: Medium (4)
$test\ score < (\mu - 1{,}0\sigma)$: Low (5)

Then only 2 students were selected, namely 1 student each from the high and low quotient groups based on high scores on mathematical ability tests. the TKM score category refers to the conversion of math ability scores according to Ratumanan & Laurens (2006) listed in the following table.

Table 1. Mathematics Ability Score Category

Mathematics Ability Level Category	Score
High	$80 \leq test\ score \leq 100$
Medium	$60 \leq test\ score < 80$
Low	$0 \leq test\ score < 60$

In this study, there were two math problems that students had to work on. The analysis of mathematics problem solving tests is carried out using indicators of thought processes in solving problems based on the Polya steps as follows.

Table 2. Indicators of Student Thinking Processes in Solving Mathematical Problems

Problem Solving	Thinking Process	Indicator	Code
Understand the problem	Formation of understanding	Explain the content of the given problem	P1.1
	Formation of opinions	Determine what is known and asked in the given problem	P1.2
	Formation of conclusions	Choose information that is used or not used in solving problems	P1.3
Make a problem solving plan	Formation of understanding	Determine the concepts related to the given problem	P2.1
	Formation of opinions	Determine the various formulas and ways that might be used to solve the problem	P2.2
	Formation of conclusions	Choose the formula and method to be used to solve the problem	P2.3
Carry out the plan	Formation of understanding	Explain the solution plan that has been made	P3.1
	Formation of opinions	Write down the steps for solving the problem in a	P3.2

Problem Solving	Thinking Process	Indicator	Code
		coherent manner	
	Formation of conclusions	Implement the selected solution steps	P3.3
Recheck answers	Formation of understanding	Review the steps used in solving the problem	P4.1
	Formation of opinions	State that the results of the settlement have or have not answered the problem	P4.2
	Formation of conclusions	Concludes that the results of the settlement have or have not answered the question	P4.3

The results of TPM's answers were used as a reference in conducting interviews. Interview data analysis was carried out using the stages of data reduction, data presentation, and drawing conclusions.

RESULTS AND DISCUSSION

Result

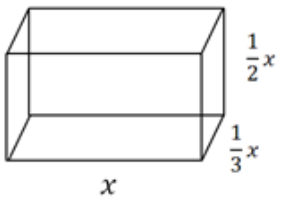
Based on the results of the emotional quotient questionnaire and the mathematical ability test (TKM), two of VIII-H students were selected as research subjects. The following are the subjects in this study.

Table 3. Research subject

Emotional Quotient (EQ)	EQ score	TKM score
High EQ	183	92
Low EQ	110	88

Based on the analysis of problem solving according to Polya and the results of the interviews, it can be seen that each subject has a different tendency to solve problems based on Polya's steps. The two subjects were given the following questions.

"Mr. Kardi is someone who likes to turn abandoned objects into useful things again. One day, Mr. Kardi found a piece of 100 cm × 100 cm glass that he had bought for IDR 950,000 in his house's warehouse. Then he had the idea to make an aquarium in the form of a glass block. The ideal form of a block aquarium is as follows.



Determine the size of the aquarium Mr. Kardi should make in order to get the maximum volume!"

Figure 1. Problem Solving Test

Results of Subjects with High Levels of Emotional Quotient in Solving Mathematics Problems (ST)

Stages of Understanding the Problem

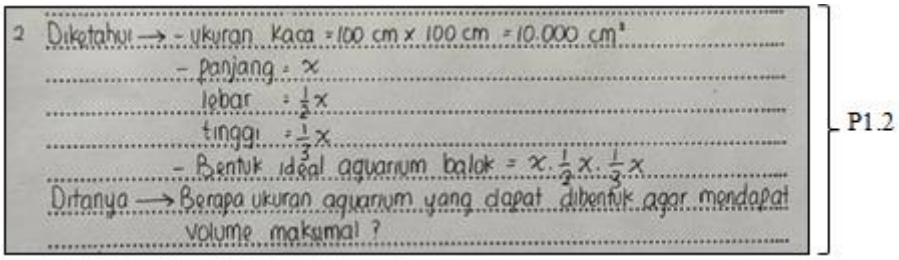


Figure 2. ST's answer on TPM

Based on the picture above, before solving the test, ST write the information about the questions on the TPM answer sheet in a coherent and clear way, judging from what is known and what is asked.

The following is an excerpt from ST's interview on the level of understanding the problem in solving TPM

PE : Have you read the questions carefully?
ST : Yes, I read it repeatedly.
PE : Do you understand about this problem?
ST : Understood.
PE : Try to explain what the contents of the problem.
ST : So, the problem is we are looking for the size of the aquarium from the glass to get the maximum volume and the size of the glass is 100 cm×100 cm. ***(P1.1)***
PE : What is known from the question?
ST : What is known is the size of the glass first, the size of this glass $100\ cm \times 100\ cm$ *with a price of IDR 950,000.00 and also the ideal length of the aquarium is* x*, the width is* $\frac{1}{2}x$*, and height* $\frac{1}{3}x$*.* ***(P1.2)***
PE : Then what was asked?
ST : The size of the aquarium that can be shaped to get the maximum volume. ***(P1.2)***
PE : In that question, is there any information that is not needed to solve the problem?
ST : The price of the glass. ***(P1.3)***
PE : Then what information did you use to solve this problem?
ST : What I use is the size of the glass and the ideal size of a block aquarium. ***(P1.3)***

Based on the interview excerpt above, the first thing ST did was read the questions over and over again in order to understand the problem. ST can explain the contents of the problem again using their own language. Then ST mentions things that are known and asked in questions in a coherent and clear manner, according to what is written on the answer sheet. Furthermore, ST can state the information that is used and not used correctly and clearly. It can be seen that ST uses all the information to solve the problem except the price information.

Stages of Making a Problem Solving Plan

In making problem solving plan, data was obtained from interviews with students. The following is an excerpt from ST's interview at the stage of making a TPM completion plan.

PE : What concept is related to this problem?
ST : Surface area of a block. ***(P2.1)***
PE : Then what formulas and methods might be used to solve this problem?
ST : What might be used is the surface area of the beam. The way to do this is to directly find the size of the aquarium using the ideal size that is already known in the problem. All that remains is to plug it into the formula for the surface area of the block. ***(P2.2)***
PE : Is there another way?
ST : Maybe guessing the size immediately. ***(P2.2)***
PE : Then to answer this problem, what formula and method did you end up using?
ST : To solve this problem I use the formula for the surface area of a cuboid. ***(P2.3)***
PE : Then what method do you use?
ST : I counted first x ideally how much use the formula for the surface area of a block, then the surface area is then entered into the area of the glass after you find the value, then substituted for the ideal width and height. After that I tried to draw the sides of the block so that it would fit on the glass, whether or not it would be enough if I used the size I got. Otherwise yes x lowered again. At least you know what the size limit is, so it's not abstract. ***(P2.3)***
PE : x lowered what do you mean?
ST : Suppose I found x it was 20 and then I found the width and height too and it turned out that it was too big if it was made on the glass, that means I tried it x 19, 18, etc. until you get the right size.
PE : Why don't you try to find the size directly by guessing the size directly?
ST : There are many possible sizes, it won't be finished later. Wasting time.

Based on the interview presentation above, the stage of making a problem solving plan, what ST did was to determine the concept related to the problem, namely the surface area of the beam. Furthermore, ST determines the possible formulas and methods used to solve the problem. ST states several formulas and methods used to solve the problem, namely by finding values x ideal using the formula for the surface of the beam, after finding its size, analyzing whether the size obtained by the ST is sufficient or not if it is made of sized glass $100\ cm \times 100\ cm$ by drawing the sides of a block of known size on (as if) measuring glass $100\ cm \times 100\ cm$. If the sizes of the beam ribs are too large then determine the size x less than he got. Apart from that, the method ST mentioned is by directly guessing the size of the block without using any formula. Furthermore, ST chooses the way he uses to solve the problem. It can be seen that ST chose the first method from the ways he mentioned before. ST did not choose the method by guessing the appropriate measurements directly because according to ST it would waste more time. It can be seen that ST thinks about the consequences of possible ways before acting. In this case it is acting to solve the problem.

Stage of Carry Out the Plan

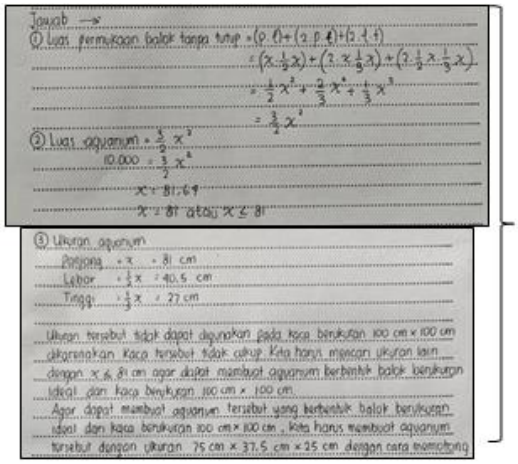


Figure 3. ST's answer on TPM

Based on the answer sheet above, ST writes down the steps coherently. starting from ST using the surface area of the beam without cover to find the surface area of the ideal beam, by substituting the dimensions of the ideal beam in the formula. Next, SR looks for a value$x$ by substituting the surface area of the glass on the surface area of the block and obtained $x \leq 81$. So that the maximum size for the length of the aquarium is 81 cm, width 40.5 cm, and height 27 cm. however ST does not use that size because if you use that size the glass is sized $100\ cm \times 100\ cm$, then the glass is not enough. So, ST looks for size $x < 81$. ST chose a length of 75 cm, a width of 37.5 cm and a height of 25 cm, because that is the maximum size that can be made from glass of the same size $100\ cm \times 100\ cm$, so it will get the maximum volume.

The following is an excerpt from ST's interview at the stage of implementing the TPM plan.

PE : Try to be clear on how you plan to solve this problem.
ST : So, I will initially look for the ideal aquarium length, namely x by using the formula for the surface area of a block without a lid, because aquariums usually don't have a lid. After meeting x then the width and height will also meet. Then I'll create an eg square $100\ cm \times 100\ cm$ then I tried to draw the sides of the beam whether it would fit or not. ***(P3.1)***
PE : Are these steps you wrote down according to your original plan?
ST : Yes. ***(P3.2)***
PE : Are you able to solve this problem according to your plan and steps?
ST : Yes, I can. ***(P3.3)***
PE : Did you have a hard time working on it?
ST : No.

Based on the interview presentation above, the stage of carrying out the plan, ST explains the steps or plans for solving the problem. These steps are in accordance with the initial plan that was thought of and in accordance with what was written on the answer sheet. Furthermore, ST implements the completion steps. It can be seen that ST can maintain the plan by implementing the steps of the solution properly to obtain the size of the aquarium

with the maximum volume. ST stated that he was able to solve the problem in accordance with the steps and had no difficulty in doing it.

Stage of Re-Checking Answers

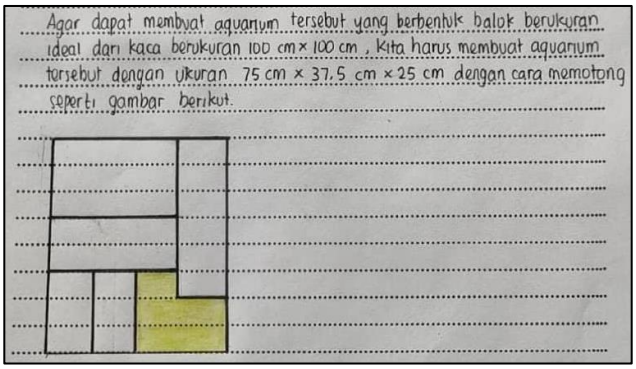


Figure 4. ST's answer on TPM

Based on the results of ST's answers above, ST concluded that the size for making a block aquarium from glass is the same size $100\ cm \times 100\ cm$ in order to get the maximum volume is $75\ cm \times 37{,}5\ cm \times 25\ cm$.

The following is an excerpt from ST's interview at the stage of re-checking TPM's answers.

PE : Have you checked the steps and the results again?
ST : I have. ***(P4.1)***
PE : Do you think your final result answers the problem question or not?
ST : Yes. ***(P4.2)***
PE : What can you conclude?
ST : In conclusion, the size of the aquarium that must be made is to get the maximum volume from the sized glass $100\ cm \times 100\ cm$ *is* $75\ cm \times 37{,}5\ cm \times 25\ cm$. ***(P4.3)***

Based on the interview excerpt above, the stage of re-checking the answers, ST has re-examined the steps and the final answer. The subject also stated that ST believed that the end result of the solution had answered the problem. Furthermore, ST stated that the conclusion of the final result was in accordance with what was written on the answer sheet that the size of the aquarium that must be made of measuring glass $100\ cm \times 100\ cm$ is$75\ cm \times 37{,}5\ cm \times 25\ cm$.

Results of Subjects with Low Levels of Emotional Quotient in Solving Mathematical Problems (SR)

Level of Understanding the Problem

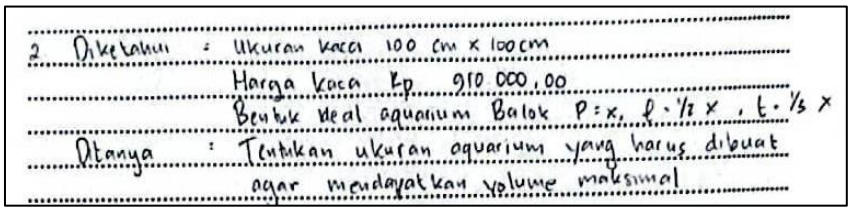


Figure 5. SR's answer on TPM

Based on the picture above before doing the SR write what is known and asked first on the answer sheet.

The following is an excerpt from SR's interview at the stage of understanding the problem in solving TPM.

PE : Do you understand about this problem?
SR : Yes, I do.
PE : Have you tried reading it repeatedly?
SR : No, only once.
PE : Try to explain the contents of the problem.
SR : Making a block-shaped aquarium with an ideal shape as in the question of measuring glass $100\ cm \times 100\ cm$ *in order to get the maximum volume.* ***(P1.1)***
PE : Then what is known about what?
SR : All that is known is sized glass $100\ cm \times 100\ cm$ *, the ideal size of the aquarium, and the price of the glass.* ***(P1.2)***
PE : Then what is asked in the question?
SR : What was asked was the size of the aquarium with the maximum volume of the sized glass x*.* ***(P1.2)***
PE : Which information did you use to solve this problem?
SR : All of that, except the price of the glass. ***(P1.3)***
PE : So, the information you don't use is the price of glass?
SR : Yes.
PE : Why?
SR : Because it doesn't help to solve the problem.

Based on the interview excerpt above, the first thing SR did was read the questions in order to understand the problem even though SR only read it once. SR can explain again the contents of the problem using his own language. SR can mention things that are known and things that are asked in clear questions according to the answer sheet. Furthermore, SR can mention the information that is used and not used to solve the problem correctly and clearly. It can be seen that SR uses all the information to solve the problem except the information about price.

Stages of Making a Problem Solving Plan

In making a settlement plan, data was obtained from interviews with students. The following is an excerpt from SR's interview at the stage of making a TPM completion plan.

PE : What concept is related to this problem?
SR : The concept of the surface area of a cuboid. ***(P2.1)***
PE : Then what formulas and methods might be used to solve this problem?
SR : The formula for the area of a block, and the possible way is to make a net of blocks first so it's easy to determine x *then find the area of the block and the area of the glass, then the area of the glass and subtract the area of the block.* ***(P2.2)***
PE : Is there a formula or other possible way?
SR : I don't know, I just thought of that.
PE : So, what is the formula or method that you then use to solve the problem?
SR : Yes, as I mentioned just now. ***(P2.3)***

Based on the interview excerpt above, SR determines the concept related to the problem, namely the surface area of the beam. Then SR was less able to mention possible formulas or other methods used to solve the problem. It can be seen that SR only mentions one possible way to solve the problem. SR only chose one way to solve the problem because that was the only way SR could think of, so there was no other choice.

Stage of Carry Out the Plan

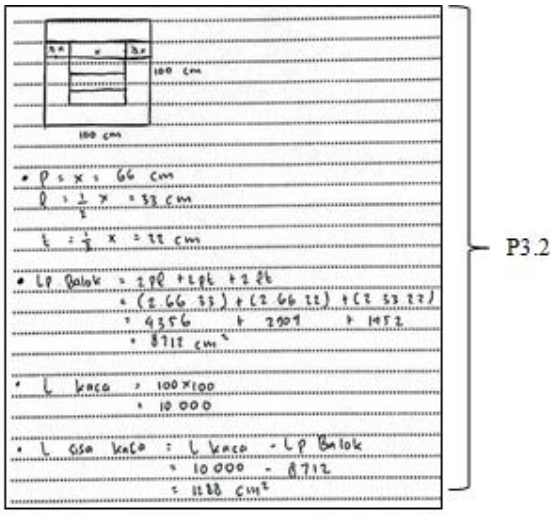


Figure 6. SR's answer on TPM

Based on the answer sheet above, SR wrote down the steps for solving it. It can be seen that SR uses the formula for the surface area of a beam and draws a net of blocks on a measuring box $100\ cm \times 100\ cm$. SR looks for the size of the block by finding the surface area of the block that is close to the size of the surface area of the glass. It can be seen that SR directly substitutes for a length of 66 cm, a width of 33 cm and a height of 22 cm in the formula for the surface area of a cuboid. Then SR subtracted the surface area of the glass from the surface area of the block he found to prove that this was the right size to make a block of glass of the same size $100\ cm \times 100\ cm$ at maximum volume.

The following is an excerpt from SR's interview at the stage of implementing the plan in completing TPM.

PE : Try to be clear about your solution plan for the problem.
SR : So first make a net of blocks to estimate the length width and height then ifx it is known just entered into the formula for the area of the beam. Then calculate the area of the glass, then the area of the glass is reduced by the area of the block. ***(P3.1)***
PE : Do the steps you wrote match the plan you made?
SR : Yes.
PE : Are you able to solve this problem according to your plan and steps?
SR : I can't.
PE : Why cannot?
SR : Because there seems to be a lot of remaining glass, but the nets that I drew are maximized. ***(P3.3)***

Based on the interview excerpt above, SR explained the plan used to solve the problem, namely SR determined the ideal size of the aquarium block by guessing the size with the help of the nets he made on a (as if) sized square $100\ cm \times 100\ cm$ without analyzing further whether the size of the aquarium he determined will get the maximum volume. Then SR wrote the solution steps on the answer sheet according to the plan he mentioned during the interview. SR applies the solution steps to the problem but the final answer obtained is wrong.

Stage of Re-Checking Answers

The following is an excerpt from SR's interview at the stage of re-examining answers in completing TPM.

PE : Did you recheck your work?
SR : No. ***(P4.1)***
PE : Why don't you check again?
SR : I was lazy.
PE : Why did you lazy?
SR : I used to not to check again.
PE : Do you think your final result answers the problem question or not?
SR : I don't think so. ***(P4.2)***
PE : Why do you think like that?
SR : Because there is still a lot of remaining glass.
PE : Try to tell the conclusion of your answer.
SR : I don't know, because my answer seems to be wrong. So I can't come to a conclusion yet. ***(P4.3)***

Based on the interview excerpt above, SR did not re-examine the answers and the steps involved. SR was lazy to check again because he was used to not checking again after the work was done. Then SR stated that the results of the settlement had not answered the problem because according to SR the size of the aquarium he had determined still left a lot of glass, so the aquarium did not have a maximum volume. SR could not conclude the results of the settlement because they were still not sure about the results of the settlement.

Discussion

Students' Thinking Process in Solving Mathematical Problems Based on High Emotional Quotient (ST)

In the stage of understanding the problem, the first thing ST did was to read the questions over and over again so that they could re-explain the contents of the problem given when asked during the interview. Then ST writes down what is known about the ideal size and price of glass. As well as writing down the things asked in the questions correctly, both in writing and during the interview. ST uses all the information in the problem to solve the problem except information about prices because prices are not used to solve problems. In accordance with the results of research by Chasanah and Rosyidi (2018) that students with a high level of quotient read problems by retelling existing problems and digging up important information to solve problems. The results of Supriadi's research (2015) also revealed that students with a high level of quotient were able to determine what was known and asked, and determine sufficient information to answer questions.

In the stage of making a problem solving plan, ST first determines the concept related to the problem, namely about surface area. Furthermore, ST thought of various methods used to solve the problem, namely using the formula for the surface area of a block in determining the size of the aquarium. Another way mentioned is by guessing the size directly without using any formula. Then to solve the problem, ST chose one method that he used, namely choosing a method by determining the size of the aquarium using the surface area of the block. ST does not use trial and error because for him this method will

take a long time. The subject shows the characteristics of individuals with high emotional quotient, namely thinking about the consequences before acting, in this case thinking about the consequences of the way that ST did not choose before solving the problem. In solving problems, the results of the research at this stage are in accordance with the results of Supriadi's research (2015) that students with high emotional quotient are able to determine concepts and alternative problem-solving steps.

In the stage of implementing the plan, ST explained the plan to solve the problem by first calculating using the surface area formula, then determining the size of the aquarium. Furthermore, ST writes down the steps on the answer sheet in accordance with the plans made, ST can also mention these steps during the interview. Then ST applies the steps to finish consistently to get the size of the aquarium with the maximum volume. In solving problems, the results of the research at this stage are in accordance with the results of Chasanah and Rosyidi's research (2018) that students who have a high level of emotional quotient write down the steps for solving them coherently and get the final result correct. In addition, the results of Supriadi's research (2015) revealed that students with high emotional quotient were able to use planned steps to answer problems.

In the stage of re-checking the answers, ST re-checks the results of his work to ensure that the results are correct and have answered the problem. So that ST can state that the solution results have answered the problem, because he can determine the size of the aquarium with the maximum volume. After that ST can draw conclusions from the results of the settlement through writing or during interviews. In accordance with the results of research by Chasanah and Rosyidi (2018) that students with a high level of emotional quotient check all answers from the start and check the calculations that have been made. In addition, the results of Supriadi's research (2015) also revealed that students with high emotional quotient were able to check again and feel confident about the steps that had been prepared.

Students with high emotional quotient are able to carry out thought processes in solving problems well. The results of this study are in accordance with research conducted by Supriadi (2015) which shows that students with high emotional quotient are able to fulfill problem solving indicators. Festus (2012) states that people who are in a good mood tend to think and vice versa.

Students' Thinking Process in Solving Mathematical Problems Based on Low Emotional Quotient (SR)

In the stage of understanding the problem, the first thing SR did was read the question once but SR could explain again the contents of the problem given when asked during the interview. Then SR wrote down what was known about the ideal size and price of glass. As well as writing down the things asked in the questions correctly, both in writing and during the interview. SR uses all the information in the problem to solve the problem except information about prices because prices are not used to solve problems. In accordance with the results of Chasanah and Rosyidi's research (2018) that students with

low levels of emotional quotient understand problems by retelling problems using their own language.

In the stage of making a problem plan, SR first determines the concept related to the problem, namely about surface area. Next, SR thought about the method used to solve the problem. SR only thinks of one way that will be used to solve the problem, namely by directly guessing the size and substituting it into the surface area formula. SR said that there were other possible ways, but he didn't know what they were like. So to solve the problem, SR only chooses one way to solve the problem. In accordance with the results of Supriadi's research (2015) that students with low emotional quotient are able to determine concepts but are unable to determine alternative problem-solving steps.

In the stage of implementing the plan, SR explained the plan made to solve the first problem, namely by calculating the area of the paper, the surface area of the rectangular pyramid, and the surface area of the cube without a lid, the sizes used were obtained by guessing directly. This size is used to draw a paper cutting pattern so that it can determine the minimum remaining paper. The plan to solve the next problem is to determine the surface area of the block that is close to the area of the glass. The size used by SR is obtained by guessing directly. This size is used as the final result of the given problem. Furthermore, SR wrote down the steps on the answer sheet in accordance with the plans made, SR could also mention these steps during the interview. Then SR applied the solving steps to the first problem, but not until the end because SR could not determine the paper cutting pattern according to the plan made before. SR said that he was confused when determining the paper cutting pattern. In accordance with Supriadi's opinion (2015) that students with low emotional quotient will find it difficult to solve problems because most are still confused. SR also applies the resolution steps to the next problem. But the final answer obtained is wrong. In accordance with the results of Dari and Budiarto's research (2016) that students with low levels of emotional quotient are less thorough in completing settlement plans, as a result students do not provide correct answers in solving problems. In addition, the results of Supriadi's research (2015) revealed that students with low emotional quotient were unable to carry out problem solving plans, due to student errors when determining alternative steps at the previous stage.

In the stage of re-checking the answers, SR did not re-examine the steps and the final results of the two problems. SR was lazy to check again because he was used to not checking again after the work was done. SR stated that the results of the solution did not answer the problem, because he was confused when making paper cutting patterns on the first problem. Apart from that, in the next problem, SR felt that the size of the aquarium that was obtained was not right because it did not have a maximum volume. Therefore, SR cannot draw conclusions from the results of the settlement through writing or during interviews. In accordance with the results of research by Chasanah and Rosyidi (2018) that students with a low level of emotional quotient do not re-examine their answers, so the answers are not appropriate for solving the given problem. In addition, the results of Dari

and Budiarto's research (2016) revealed that students with low emotional quotient did not correct the solution chosen from the beginning to the final result, resulting in students not giving correct answers.

Students with low emotional quotient have difficulty in carrying out thought processes in solving problems. The results of this study are in accordance with research conducted by Supriadi (2015) which shows that students with low emotional quotient are still unable to meet problem solving indicators. Nurnaningsih (2011) suggests that students with low emotional quotient will experience difficulties in solving problems, because they have not been able to respond to emotional conditions naturally and positively and most are still confused. Berrocal and Ruiz (2008) argue that someone with limited emotional skills is more likely to experience stress and emotional difficulties in their learning.

This study shows that students with low emotional quotient have high mathematical abilities but do not find the final solution to the problem and produce the wrong final answer when solving a flat sided space shape problem. This is because the student feels that the questions presented in the problem solving test are too difficult compared to the math problems she is used to working on. In addition, these students are also not used to solving problem solving questions that are equivalent to the questions presented in the problem solving test.

CONCLUSION AND SUGGESTIONS

The thinking process of junior high school students with high emotional quotient in solving problems. In the stage of understanding the problem, students explain again the contents of the problem given. Students determine things that are known and asked on the answer sheet or orally. Students use all the information presented in the problem to solve the problem except information about prices. In the stage of devising a plan, students determine the concept of surface area related to the problem. Students determine the various possible ways used to solve the problem, namely by using the formula for the surface area of a block in determining the size of the aquarium. Another way mentioned is by guessing the size directly without using any formula. Students choose one way to solve the problem by using the formula for the surface area of a cuboid. In the stage of carrying out the plan, students explain the problem solving plan using the previously selected method and write down the steps for solving it on the answer sheet. Students apply the completion steps to the end to get the size of the aquarium with the maximum volume. In the stage of looking back, students re-check the results of their work to ensure that the results are correct. So that students can state that the results of the solution have answered the problem because they can determine the size of the aquarium with the maximum volume. Furthermore, students can make conclusions from the results of their completion through writing or orally during interviews.

The thinking process of junior high school students with low emotional quotient in solving problems. In the stage of understanding the problem, students explain again the contents of the problem given. Students determine the things that are known and asked on the answer sheet or orally during the interview. Students use all the information presented in the problem to solve the problem except information about prices. In the stage of devising a plan, students determine the concept of surface area related to the problem. Students only know one way to solve the problem, namely by guessing the size directly and substituting it into the surface area formula. So to solve the problem, students choose to use one of these methods. In the stage of carrying out the plan, students explain the problem solving plan using the previously selected method and write down the steps for solving it on the answer sheet. Students apply the steps of completion but the final answer is wrong. In the stage of looking back, students do not re-check the results of their work. Students are lazy to check again because they are used to not checking again after the work is done. Students stated that the results of the solution had not answered the problem, because the size of the aquarium obtained was wrong and they were unsure of the method used. So that students cannot make conclusions from the results of their completion either through writing or orally during the interview.

The results of this study indicate that in the thinking process of students with low emotional quotient they are still not optimal in making conclusions because students are unsure of the final result of their completion and are lacking in carrying out the plan. Based on this, it is hoped that the teacher will often provide similar practice questions so that students better understand the problems faced and can carry out all stages of the thinking process in solving mathematical problems.

This study discusses students' thinking processes in solving flat-sided geometrical problems in terms of emotional quotient. So it is suggested for other researchers who will conduct further research relevant to this research to use other quotient reviews such as intellectual quotient and spiritual quotient and choose other materials such as curved side shapes, SPLDV, and others.

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