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Analysis of the Difficulties of Students Mathematical Creative Thinking Process in Implementing of Problem-Based Learning Model

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Abstract This study aims to: (1) determine the level of students mathematical creative thinking abilities; (2) analyze the difficulties of students mathematical creative thinking process through the Problem Based Learning (PBL) model. This type of research is a qualitative descriptive study using Miles and Huberman's data analysis methods. The results of the analysis of the data obtained indicate that students who are capable of creative thinking in the high category can reach the stages of preparation, incubation, illumination, and verification. For students who can think creatively, the medium category takes several minutes in the incubation stage and difficulty in finding concepts with different ideas. While students with low ability to think creatively have difficulty starting from the preparation stage to the verification stage.

Keywords: *analysis, mathematical creative thinking process, Problem Based Learning model*

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1. Introduction

There are many reasons for the need for students to learn mathematics. Cornelius stated the reason for the need to study mathematics because mathematics is a means of thinking clearly and logically, a means for solving problems of everyday life, a means of recognizing patterns of relationship generalizing experiences, a means for developing creativity and a means for raising awareness of cultural development [1]. Education 2030 will ensure that all individuals acquire a solid foundation of knowledge, develop creative and critical thinking and collaborative skills, and build curiosity, courage, and resilience [2].

Indonesian students achieved the lowest rank in the score of creativity in creative thinking that was followed by eight countries [3]. Preliminary research was conducted in class VII-5 of SMP Negeri 27 Medan with diagnostic tests to measure students' creative thinking abilities. From the results of this initial diagnostic test, it shows that students in the ability to think creatively are still relatively low. Because, from 32 students only three students who have high-level creative thinking abilities, seven students who have medium level creative thinking abilities and as many as 22 students who have low-level creative thinking abilities.

Based on [4] creative thinking is a habit of the mind that is trained by paying attention to intuition, animating imagination and expressing new possibilities opening up amazing perspectives and developing unexpected ideas. Another opinion [5] stated, "Creative thinking can be defined as the entire set of cognitive activities used by individuals according to a specific object, problem, and condition, or a type of effect toward a particular event and the problem based on the capacity of the individuals". Munandar stated that the indicators of creative thinking based on students' cognitive behavior were fluency, flexibility, originality, and elaboration [3].

To produce creative thinking someone can not be separated from the thinking process. The creative thinking process is a process that combines logical thinking and divergent thinking. To find out the students' creative thinking process, the guidelines used are the creative processes developed by Wallas because it is one of the most commonly used theories for knowing the creative thinking process which states that the creative process includes four stages: (1) the preparation stage, at this stage a person prepare to solve problems by collecting relevant data; (2) incubation stage, at this stage someone seemed to break away temporarily from the problem and this stage is the beginning of the process of inspiration that is the starting point of new discoveries from preconscious; (3) illumination stage, at this stage someone gets a solution to the problem that is followed by the emergence of inspiration and ideas that start and follow the emergence of new inspiration or ideas; (4) verification stage, at this stage is stage of someone testing and checking the problem solving of reality [3].

Many factors as a source of causes of learning difficulties. As an example sourced from outside students, for example the learning process related to the curriculum, how to present the subject matter, and the learning approach taken by the teacher [6]. Difficulty of mathematics learning in students related to learning abilities that are less than perfect. These deficiencies can be revealed from solving mathematical problems that are incomplete or complete but wrong. [7] stated that the target or object of the study of mathematics is facts, concepts, operations, and principles.

According to Arends that Problem-Based Learning (PBL) can be help students to develop thinking skills, problem-solving and independent learning [8]. Problem-Based Learning (PBL) model is a learning process that starts with problems from a work environment and helps to improve the development of learning skills in open, reflective, critical, and active learning patterns, and facilitating successful problem solving, communication, group work, and interpersonal skills are better than other model.

[9] Shows that after there is multimedia-based Problem-Based Learning (PBL) in mathematics learning, the average creative thinking ability of students is at the medium criteria (59.18). [10] Concluded that the problem-based learning model directs students to focus on being active learners and directly involved in group learning so the results of the study indicate an increase in the ability to solve mathematical problems taught with higher problem-based learning from students who are taught with conventional learning. Furthermore, [11] stated, students improved their problem-solving skills in solving Related to Change problems when incorporating games in their learning. Thus, this study has shown some value added to the area of Problem-Based Learning (PBL).

Based on [12] stated, PBL model is an alternative learning model that can improve students' creative thinking skills. With the PBL model students are given the opportunity to think creatively. Another alternative is how to convey material so that students feel happy and understand the material to be studied so that creativity will arise in students including new ideas and ideas that can enhance creativity in learning. This learning model is believed to be able to improve student learning creativity.

So, the Problem-Based Learning (PBL) model is an appropriate model applied to analyze the difficulties of the mathematical creative thinking process of class VII-5 students at SMP Negeri 27 Medan.

2. Research Methods

This research is a descriptive qualitative study using the case study method. [13] Qualitative research is research that intends to understand the phenomena experienced by research subjects such as behavior, perception, motivation, action, and others. Holistically and by way of description in the form of words and language, in a particular natural context and by utilizing various natural methods.

The research has been carried out in class VII-5 of SMP Negeri 27 Medan, totaling 32 students with material mathematics teaching in quadrangle, in the academic year 2018/2019. [14] Techniques of data analysis in qualitative research by using the steps of Miles & Huberman data analysis is shown in Figure 1.

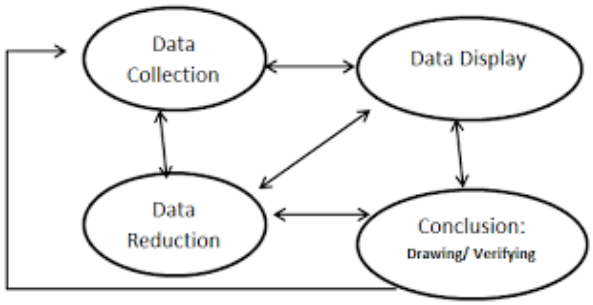

Figure 1. Components of Data Analysis: Interactive Model & Huberman

Based on Figure 1 above, after collecting data the researcher made anticipatory measures before doing data reduction. The score of each student is determined based on test results with a mathematical creative thinking test. All answer sheets from the test results are collected for examination and scored according to the scoring guidelines.

For the determination of the minimum standard based on the criteria of minimum completeness ≥ 2.67 [15]. The value of students knowledge and skills is determined by the following formula:

$$\text{Scores } of \text{ } Students = \frac{\text{Score obtained}}{\text{Maximum score}} \times 4 \quad [16]$$

Based on this view, the results of the test the ability of mathematical creative thinking can be presented intervals of the criteria in Table 1 below:

Table 1. Levels of Mathematical Creative Thinking

Score Interval	Category
3.18 ≤ SKBKM< 4.00	High
2.18 ≤ SKBKM< 3.17	Medium
0.00 ≤ SKBKM< 2.17	Low

Note: SKBKM (Score by Ability of Mathematical Creative Thinking)
Source: Modification from Wulandari (2018)

To check the validity of the data triangulation techniques. [13] Triangulation is a technique of checking the validity of data by utilizing something outside the data, for checking or as a comparison to the data. In this research, triangulation will be done by comparing the interview data form the subject of student selection based on the level of creative thinking skill, mathematical creative thinking test results, and observation notes.

3. Result and Discussion

3.1. Result

Based on research that has been done by obtaining data that is the test results of students mathematical creative thinking ability, the results of interview related to the creative thinking process of the difficulties experienced by students. As for the data level of mathematical creative thinking abilities of students can be seen in Table 2 below:

Table 2. Level of Mathematical Creative Thinking of Students VII-5 Smp Negeri 27 Medan

Score Interval	Total Students	Percentage	Category
3.18 ≤ SKBKM< 4.00	6	18.75%	High
2.18 ≤ SKBKM< 3.17	12	37.5%	Medium
0.00 ≤ SKBKM< 2.17	14	43.74%	Low

Note: SKBKM (Score by Ability of Mathematical Creative Thinking)

Based on the results of the test of mathematical creative thinking abilities of students as many as 32 people showed that the students with the ability to think creative mathematical low category more 14 students and then followed by the students with the ability to think creatively mathematical medium category are as many as 12 students. While students who can think high category just a bit of a minimum of 6 students.

The results of the description of the answer process and discuss the difficulty of students in solving the test questions of creative thinking skills related to the creative thinking process, then carried out the student interview stage. Subjects are needed from among the students studied, as many as three students as subject to interviews according to the level of mathematical creative thinking ability. The selected subjects interviewed are as follows in Table 3:

Table 3. Selected Subjects for Analysis of Difficulty of Creative Thinking Processes

No	Student Code	Level of Creative Thinking Ability
1	S-31	High Ability
2	S-15	Medium Ability
3	S-23	Low Ability

Based on the chosen subject, an error is analyzed based on the answer sheets and interviews, to obtain the difficulties of mathematical creative thinking process of students who are triangulated based on the student answer sheets and interview.

3.1.1. Analysis of Difficulty of Student Mathematical Creative Thinking Processes in High Category

S-31 as a subject among students who can think creatively in the high category analyzed in the difficulties of the creative thinking process conducted in-depth interviews to produce an analysis report releated to the answer sheet. The results obtained by S-31 in completing the four test questions of creative thinking based on their ability to think creatively in the following Table 4.

S-31 in solving number 4 is not able to achieve by all indicators of creative thinking. S-31 in solving problems and able to achieve fluency indicator and elaboration indicator. In the fluency indicator, it is resolved in two ways. On the indicator of flexibility, S-31 is not able to solve problems with no strict rules or different ideas. Because, the first and second ways of the answer using the same rules or ideas, namely the area formula of the trapezoidal and assuming the size of the other sides are known to find the other side. The indicator of originality, S-31 cannot find a new way to solve a problem or cannot find a way that has not been thought of by other students. The elaboration indicator, S-31 can arrange and develop detailed solutions. Based on answer sheet S-31 there were no errors related to mathematical objects.

Table 4. The Results of The Creative Thinking Skills S-31 with High Category on Any of The Indicators of Creative Thinking

Indicators of Creative Thinking	Description	Question Number			
		1	2	3	4
Fluency	The ability to solve a problems and provide answers to various ways (minimum of two ways of solutions or more than two solutions)	√	√	√	√
Flexibility	The ability to solve problems by using various strategies or with no strict rules	√	√	√	×
Originality	The ability to create solutions to problems that are different from others (with new, unique or unusual answers)	√	√	√	×
Elaboration	The ability to develop or elaborate in detail the completion of answers	√	√	√	√

Information:
√: Students can complete with appropriate indicators.
×: Students cannot complete with the appropriate indicators.

Performed analysis of the difficulties of the creative thought process S-31 based on the answer sheet problem number 4 and conduct interviews with the four stages of the process of creative thinking, according to Wall as, namely the preparation stage, the incubation stage, illumination stage, and the verification stage of through interview of the subject.

The results obtained in the preparation stage, S-31 can understand the problem well. Because S-31 can explain information from question number 4 and explain the problem to be solved. So, the preparation stage students with the ability of high creative thinking have not difficulty in gathering information and can provide accurate information. In this regard, S-31 understands fact number 4.

The incubation stage, S-31 does not require a long time in the precipitate matter about the number 4 or takes a short time with a few minutes and do activities cross out of scrap paper in to find ideas. can be said to be S-31 can find ideas as well as and find new concepts for problem-solving by generating a different idea.

The illumination stage, the S-31 can develop a solution to solving the problem to 4 based on earlier ideas by applying the formula of the area of the trapezoid with a heart the size of the two sides, then find the size of the side of the trapezoid of the other with the results of proper completion. Not found the difficulty in determining the principle (formula) in the resolution of issues that are resolved.

The verification stage, S-31 re-checks the answers by taking into account the calculation of settlement that has been made, the results of the first method and the second method show the same final results. Then, S-31 writes the final conclusions with answers that fit mathematical procedures. The settlement procedure contained in S-31 is following the right steps in solving mathematical problems.

3.1.2. Analysis of Difficulty of Student Mathematical Creative Thinking Processes in Medium Category

The results obtained S-15 in the complete the four question of creative thinking based on the ability to think creatively in Table 5 below:

Table 5. The Results of The Creative Thinking Skills S-15 with Medium Category on Any of The Indicators of Creative Thinking

Indicators of Creative Thinking	Description	Question Number			
		1	2	3	4
Fluency	The ability to solve a problems and provide answers to various ways (minimum of two ways of solutions or more than two solutions)	√	√	√	√
Flexibility	The ability to solve problems by using various strategies or with no strict rules	√	√	√	×
Originality	The ability to create solutions to problems that are different from others (with new, unique or unusual answers)	×	×	√	×
Elaboration	The ability to develop or elaborate in detail the completion of answers	√	√	√	√

Information:
√: Students can complete with appropriate indicators.
×: Students cannot complete with the appropriate indicators.

In the following, the answer sheet S-15 in solving the problem of question number 1 in Figure 2 and Figure 3 below:

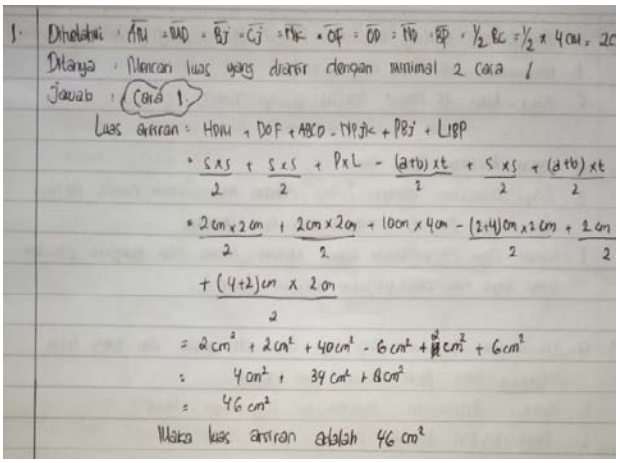

Figure. 2. Answer Sheet of S-15 with The Settlement of The First Method in Problem Number 1.

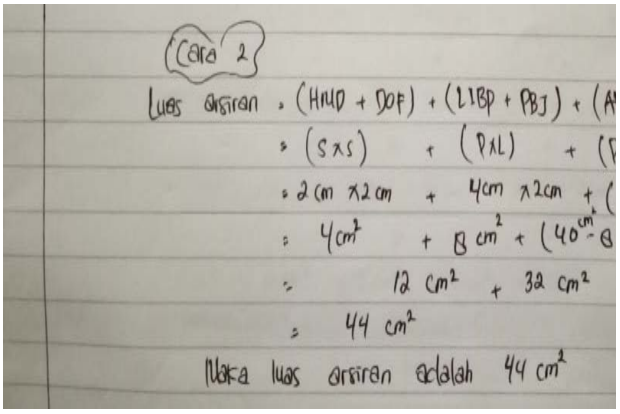

Figure. 3. Answer Sheet of S-15 with The Settlement of the Second Way in Problem Number 1.

Based on the problem-solving error of the answer of the first way in Figure 2, an analysis of the difficulty of the S-15 creative thinking process was carried out. In the preparation phase, S-15 can provide information about problem 1, by providing information about the known and asked questions in question 1. It is known from problem number 1 is if the side $AM = MD = BJ = CJ = NK = OF = OD = NP = BP = \frac{1}{2}BC = \frac{1}{2}4cm = 2cm,$ and the topic of the problem being asked is looking for shaded area.

The incubation stage, S-15 takes a few minutes a little longer than S-31 in settling the problem from question 1, besides being able to get an idea in two ways by using the area formula of square, rectangle, and trapezoid. That S-15 also carries out the same activity in crossing out opaque paper to find an idea or concept of completion before completing it completely on worksheets.

The illumination stage, S-15 develops problem-solving solutions based on previous ideas by producing two ways of solving different ideas. The difficulty experienced by S-15 is the difficulty in determining the concept of resolution, because it recalculates the area of the PBJ concept which is ABCD section, so that the completion of the first method produces inaccurate answers.

The verification stage, S-15 re-checks the worksheets, but only focused on arithmetic operations without realizing the concept errors that are used in solving problem 1 of the answer the first way. Besides, S-15 provides conclusions in completion.

The following answer sheets S-15 in solving problem number 2 with the ability to think creatively in Figure 4 and Figure 5 below:

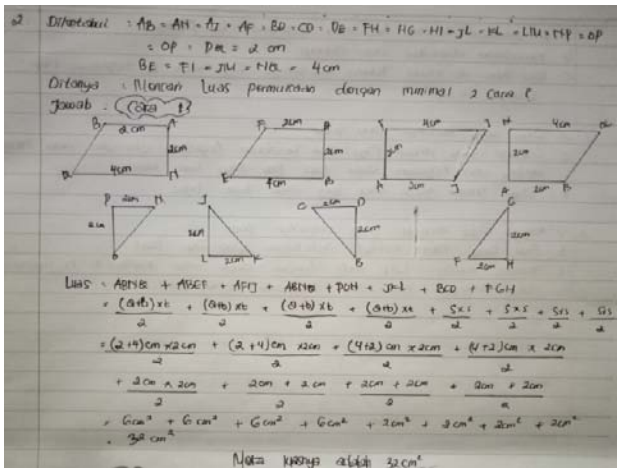

Figure. 4. S-15 Answer Sheet with First Way Completion On Problem Number 2.

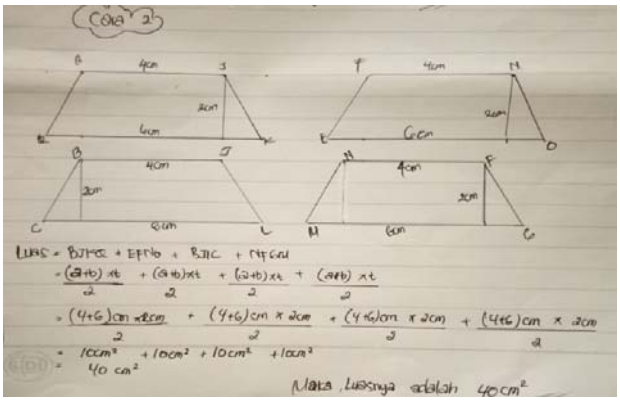

Figure. 5. S-15 Answer Sheet with the completion of the second method in Problem Number 2.

Figure 4 is the problem solving of problem number 2 with the answer the first way is the result of the correct

answer and no errors were found in the concepts, formulas used, and following mathematical procedures.

Figure 5 is the solution to problem number 2 resulted in the wrong answer at the second settlement. Based on the error in resolving the problem, then analyzed the difficulties in the creative thinking process of S-15.

In the preparation stage, the S-15 can understand the problem because the S-15 can provide an explanation or provide information from the second question about the known and asked of the problem. S-15 stated that it is known from the problem that the size of each side of the double ninja star image and problems to be solved with the ability of creative thinking at least two ways of completion. Besides, S-15 states that if the image is double ninja star can be solved if you use the concept of a quadrilateral. So, it can be said that S-15 has no difficulty in understanding the facts at this stage.

The incubation stage, S-15 takes time to ponder with a few minutes a little longer in finding settlement ideas as well doing paper crossing activities to find new concepts with ideas that are different from the concept of the first solution.

The illumination stage, the ideas obtained can be completed with two ways of completion. Firstly, S-15 completes the area of the double ninja star by turning it into four trapezoid and four triangles, the concept he changed was right with the correct calculation results. Whereas after the second method, S-15 converts it into four trapezoidal however S-15 has difficulty in determining the size of the side length that has been changed so that the answer is wrong. The error in determining the size of the trapezoidal side that he changed was a difficulty in concept.

The verification stage, S-15 conducts a re-examination on the settlement made from the first and second ways, S-15 states that he believes the first way is the right answer, but after the second way he did not find his fault. Besides, he made the conclusions from the settlement. He stated if the question number two was complicated matter for him to look for different concepts and finish looking for surface area. The concept of double ninja star is separated and then arranged to form several rectangular shapes. Then, the completion steps are used according to mathematical procedures.

In question number 4, S-15 solves the problem with the correct answer. However, the results of the width of the work did not reach the completion of flexibility and originality indicators. The results of the interview are related to the answers to question number 4, S-15 stated he had difficulty in determining other concepts to solve it in a new way and different ideas from the first way and the second solution.

3.1.3. Analysis of Difficulty of Student Mathematical Creative Thinking Processes in Low Category

The results obtained by S-23 in completing 4 test questions for creative thinking based on the ability to think creatively in Table 6 below:

Based on the S-23 answer sheet in solving problems, that S-23 is not able to solve questions number 1 and 2. After being interviewed, S-23 was unable to understand the facts of problems 1 and 2. He states that questions number 1 and 2 are problems that are difficult to solve, so they are not able to produce the ability to think creatively. Besides, S-23 is not able to do creative thought process activities.

Table 6. The Results of The Creative Thinking Skills S-15 with Low Category on Any of The Indicators of Creative Thinking

Indicators of Creative Thinking	Description	Question Number			
		1	2	3	4
Fluency	The ability to solve a problems and provide answers to various ways (minimum of two ways of solutions or more than two solutions)	×	×	×	√
Flexibility	The ability to solve problems by using various strategies or with no strict rules	×	×	×	×
Originality	The ability to create solutions to problems that are different from others (with new, unique or unusual answers)	×	×	×	×
Elaboration	The ability to develop or elaborate in detail the completion of answers	×	×	√	√

Information:
√: Students can complete with appropriate indicators.
×: Students cannot complete with the appropriate indicators.

S-23 solves the problem from question number 3 based on a solution that S-23 is unable to reach the indicator of creative thinking fluency, flexibility, and originality. Besides, unable to solve problems from number 3 to produce answers reaching indicators of flexibility and originality. The results of S-23 answer in solving the problem from question number 3 in Figure 6 below:

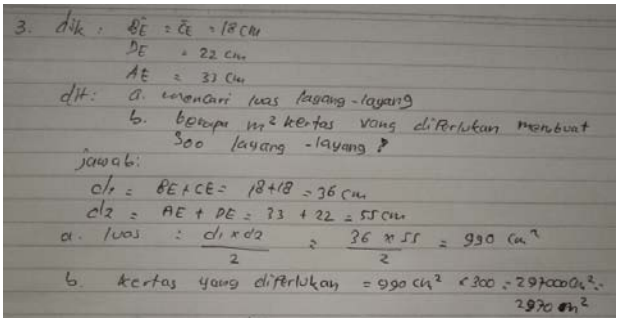

Figure 6. Answer Sheet S-23 in Problem Number 3.

Based on Figure 6 above, that there is an S-23 error in solving problems from problem number 3. Error S-23 is changing the unit area from cm2 to m2 is not correct so the result of the settlement in part b is wrong. An in-depth interview was conducted on S-23 about difficulties in the creative thinking process.

As a result, in the preparation stage that S-23 understands the facts of question number 3. Therefore, S-23 provides information obtained from these questions both known and asked from question number 3 and gather information related to problem number 3.

The incubation stage, S-23 turns out to require a long time in settling the problem to find ideas. The idea obtained by S-23 is only able to remember the previous problem solving that the solution method uses one idea and cannot find another different idea.

The illumination stage, S-23 solves the problem from question number 3 by using the concept of a kite with the broad formula of a kite. However, S-23 has difficulty in developing it to produce answers that lead to creative

thinking. So, S-23 is only able to solve the problem with one way of resolution. Questions from part a in question number 3, S-23 solve it with the correct answer. However, in the question part b he had difficulty in changing the unit area of cm^2 and m^2. At the verification stage, unable to carry out verification activities and he did not make conclusions from the settlement.

The results of S-23 answers in solving problems from questions number 4 in Figure 7 and Figure 8 below:

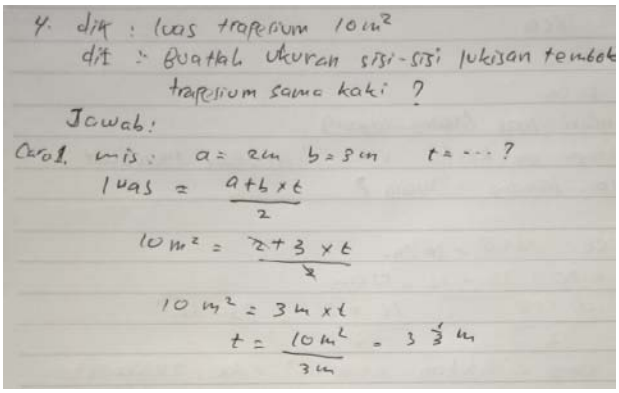

Figure 7. Answer Sheet S-23 Settlement of the First Method in Problem Number 4.

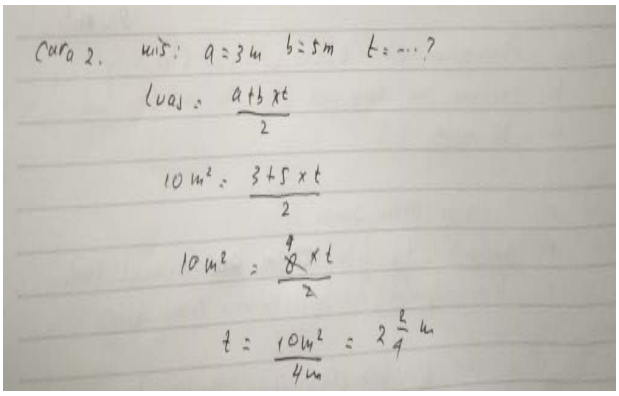

Figure 8. Answer Sheet S-23 Settlement of the Second Way in Problem Number 4.

In Figure 7, there is an error firstly so that it produces the wrong answer. The results of the S-23 interview are based on a worksheet to analyze the difficulties experienced in the subject's creative thinking process. In the preparation stage, able to provide information from question number 4 that is known that the trapezoidal area requirement is 10 m^2 and what is asked is to find the size of the sides of the trapezoid, so that the S-23 understands the facts of the problem given.

The incubation stage, S-23 states that it takes a long time to settle the problem to find ideas related to the quadrilateral concept in the trapezoid. Then in the illumination stage, S-23 can develop problem-solving solutions based on previous ideas by solving two ways using the same idea. S-23 solves the problem by making an example of the size of the trapezoidal sides a and b of different sizes, then find the high side of the trapezoid. After the first method, S-23 difficulty is found in the calculation procedure that is not making the sum of the two side sizes by giving them in brackets so that the answer results are wrong. S-23 stated that he did not know if he had to make the initial sum of two sides in line and thought the procedure used was correct. After being interviewed about the difficulties in this stage, S-23 realized the mistake he made.

The verification stage, S-23 does not re-verify the answers to question number 4 and based on the answer sheet it appears that S-23 did not write the conclusion from the completion.

4. Discussion

Students habits in conventional teaching that condition students are passive in receiving knowledge, and the teacher provides mathematical concepts and principles in the "whole" form to students, as well as not accustom students to solving problems cause a lot of problems [6].

In the learning process carried out during five meetings in class VII-5 of SMP Negeri 27 Medan, that student activeness is better after applying learning with the Problem Based Learning (PBL) model compared to previous learning which still uses conventional learning in the form of lectures or explaining theories. While learning emphasizes student-centered learning models are also needed Mathematical creative thinking skills can be trained, accustomed, to entrenched well through interaction between students and teachers. [18] An important feature of the pedagogic environment that can promote creativity is the nature of the relationship between teachers and learners, including high expectations, mutual respect, modelling of creative attitudes, flexibility and dialogue.

The students' creative thinking process based on the Wallas (1926) stage consisted of the preparation stage, the incubation stage, the illumination stage, and the verification stage. The difficulty of students in this study is inseparable from the difficulties of mathematical objects in facts, concepts, principles, and procedures.

Students with high creative thinking ability, able to solve the given problems and on average able to reach the creative thinking indicator. Based on [19], "First, for the students who are at high and moderate academic level in fluency indicator have been able to provide a lot of ideas and solve problems. However, some of them have not answered correctly the questions because they are less scrupulous in terms of constructing the solutions and arithmetic operations. Second, in high academic level in flexibility indicator, some students jump to solve the problems without considering the complex equations in another form. Third, in high academic level in originality indicator, most of the students have been able to complete the task in their own way. In addition, in elaboration indicator, the students of high academic level have already tried to solve the problems using detailed procedures, although the answer are still incorrect".

Next, analyze the difficulties of the creative thinking process in students with high creative thinking abilities no difficulties. In the preparation stage, students can gather information according to the facts that exist in the problem that is explaining the elements known and asked, giving explanations related explanations with the problem at hand. In line with the results of research [20] stated, "Result of the student work in upper category, on the answer sheet show that they can understand the given problem well. This means that the preparation stage has

been done, where they knowledge to solve problem". At the incubation stage, students who are capable of creative thinking in high categories do not require a long time in settling problems related to previous experience to find ideas with the idea of more than one way of resolution by generating new or unique settlement concepts. [20] Stated, "In incubation stage, they tried to think of the arrangement in a few minutes".

In the illumination stage, students who are capable of creative thinking in high categories can develop ideas into solutions in solving problems with their creative thinking abilities and solve according to mathematical concepts and principles, to produce results of the correct answer. At the verification stage, students with high creative thinking abilities conduct a re-examination by observing the procedure which is used to get the right and correct answers and to compare the results of the first and second solutions the answer to the result is the same. [21] Stated, the process of students with high creative thinking skills was arranged in coherent and systematic ways, and diverse answers.

[22] The accomplishment of student's creative ideas is a process of the mathematical activity. Doing mathematics does not only focus on the end solution but also how the process takes place, such as: search the patterns and rapport, conjecture testing as well as result estimation. Someone is required to use and adapt his/her gained knowledge in the activity process to create a new understanding. Apart from the developed activities in mathematics itself, the process of developing new knowledge can be also started from the activities at the outside of mathematics to solve the contextual problems. This process can enhance the student's adaptive reasoning ability, particularly in overcoming problems at outside of mathematics matter which can be possibly solved mathematically.

Students with the ability to think creatively in the medium category had an error resolving the problem at questions that they think are complicated and indicators of creative thinking difficult to achieve namely the indicator of originality. In the preparation stage, students with the ability to think creatively in the medium category have no problems in gathering information from every known element of the problem and what is asked from the problem, so the student understands the facts given. At the incubation stage, students are capable of creative thinking of medium category takes a few minutes longer than students with high creative thinking abilities in settling the problem to find ideas to produce several ideas. At this stage, students with high creative thinking ability require strokes on opaque paper to produce ideas. In the illumination stage, students can think creatively medium category able to develop ideas into solutions, then poured into a worksheet. In this stage, students who can think creatively in the medium category have difficulty finding new concepts. So the wrong concept is used in solving this problem resulted in the wrong answer.

[23] Stated, at illumination stage, research subject CTL 2, TKBK 3, and CTL 4 were able to solve problems with many ways (flexibility), problems with many solutions (fluency), and problems with unusual solutions (novelty) well. Meanwhile, research subjects on CTL 1 could only solve fluency problem.

At the stage of verification that students are capable of creative thinking category doing a re-examination of the solution, but not all the answers are checked with the good, because there is a mistake on the settlement in between the two the way that the one way there is a mistake and this is there in the answers of the first and second issues. Step on any answers which are prepared by systematically and provide a description of the end.

[23] Stated, at the verification stage, there are three different ways of testing a solution. First, research subjects check back 2 ways of solving the problem of whether producing the same solutions. Research subjects who had been able to solve flexibility problems would directly check the back 2 ways of solving the problem of whether or not it produced the same solutions. This way was done by research subjects on CTL 2, 3, and 4.

Students with low category creative thinking skills, generally, they are not able to fully solve the problem. There are even problems that are completely unable to be solved by thinking creatively. In the preparation stage, students with low creative thinking abilities are less able to provide complete information elements of the problems confronted. Thus, students with low ability to think creatively lack of understanding of the problem so unable to solve the problem correctly. In the incubation stage, students are capable of creative thinking the low category takes a long time in the precipitate problem. They are only able to generate ideas of a particular problem. Not even all the problems which can be precipitated to generate ideas in this stage. At the stage of illumination, students are enabled to think creatively in the low category only able to develop the idea into a solution on some issues of course. But there are difficulties of students in this stage, in developing this solution is not complete and not by the procedure of mathematics. At the verification stage, students are capable of creative thinking tags low, not able to conduct re-examination on the sheets of the answer, so from some problems that do not give a description that is the conclusion of the answer.

Students in the lower category from the beginning in the preparation stage, they already have difficulties. They do not understand the given mathematics problems and tasks. Besides, they do not have any information or knowledge that can be used to solve the problems. Consequently, students are unclear in implementing the idea to solve the problem and the solution obtained is also wrong [20].

5. Conclusions

Based on the results of the data analysis it can be concluded the process of mathematical creative thinking in Problem Based Learning (PBL), namely (1) students capable of creative thinking of high category, no difficulty, (2) students capable of creative thinking category, students experienced difficulty in finding new concepts that occur at the stage of illumination in developing the idea of completion be the solution so that one completion being the wrong answer, the incident because the students are not able to produce the idea different, (3) students capable of creative thinking tags low, students have difficulty in

understanding the fact of the matter of this occurs in the stage of preparation, and the difficulty in the stage of illumination in developing solutions in resolving problems and difficulties in the verification stage due to not being able to do a re-examination as well as the procedures used are not systematic and not by the rules of mathematics.

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