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Reflective Thinking Process of Junior High School Students in Solving the Mathematics Problem of Triangle and Rectangular Materials Based on the Local Load.

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Abstract. The ability of reflective thinking is the ability to connect the knowledge which students get with the old knowledge, so there are conclusions to solve new problems. In order to motivate the students to solve the problems given, the researcher wants to associate the mathematical problems that are given to students by associating something close to students who have local content in the local area. This study describes the reflective thinking of students in solving triangular and rectangular mathematical problems. This research is a qualitative descriptive study, students of 8 C grade at SMP Negeri 17 Pesawaran as the research subject. The instrument used was a written test in the form of 4 description questions and in the interview guidelines of 32 students of 8 C grade taken 5 students who took the interview. The five subjects are all the students who fullfill all the indicators of the reflective thinking. Based on the research obtained there are three subjects who are able to think reflectively in solving mathematical problems and two subjects are quite capable of reflective thinking in solving mathematical problems.

1. Introduction

Learning mathematics is the first step in shaping the science and technology in students, so that their abilities are in accordance with the times. Mathematics is included in the discipline of science and technology because it is considered capable of increasing the students' development potential. According to Susanto [7] that one of the scientific disciplines relating to knowledge and technology development is mathematics which can currently increase the ability to think and contribute to everyday problems and in the world of work, as well as providing support in the development of science and technology.

Another important thing about mathematics is that mathematics trains people about ways of thinking and reasoning in drawing conclusions. For example in the activities of inquiry, exploration,

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experimentation, showing similarities, differences, consistency and consistency. It is not wrong if one's thinking ability becomes one of the benchmarks for achieving the goals of mathematics learning, especially high order thinking skills, such as the ability to think critically, creatively, logically analytically, and reflectively. As stated by Nitko & Brokhart [3] "the focus of your teaching should be on student achievement as well as on the learning process". Therefore, learning success can be seen based on the students' thinking abilities and learning achievements.

Learning activities that emphasize the learning process will certainly bring the thinking activities in various forms and levels. The thought process that is built from the beginning in an effort to solve a problem should take place intentionally and through to completion. Completeness in this case is meant that the students must undergo the process so that they have been trained and have the opportunity to empower and function their abilities so that they understand and master what they learn and do. Thus students must be trained to have mathematical thinking skills, one of which is mathematical reflective thinking.

Noer [4] states the ability of reflective thinking in learning is one's ability to give consideration about the learning process. Considerations in the learning process for example about what they know, what they need to know, and how they bridge the gap during the learning process. In the process involves solving problems, formulating conclusions, taking into account related matters, and making decisions. Correspondingly Chee in Mentari [2] states that reflective thinking is an awareness of what is known and what is needed, this is very important to bridge the learning situation gap.

Mathematical reflective thinking ability is one of the abilities needed in mathematics learning. This is due, the target of learning mathematics, and other abilities will be possessed by students well if they are able to realize what is done is right, conclude what should be done if it fails, and evaluate what has been done. Based on the above opinion mathematical reflective thinking ability is very important, by having the ability to think mathematically reflective of course the students will know what is needed in the learning process.

Zimmerman in Sulisworo and Suryani [6] suggested that; "Motivation is an important factor in the student learning process" which means that motivation is an important factor in student learning processes. This opinion explains that motivation is a support for students in order to carry out learning activities optimally. Thus the motivation to learn, towards students is very important in supporting the spirit of learning and the goals desired by students can be achieved in accordance with educational goals. Therefore the delivery of material must be related to something close to the student. One of the things that is close to students is the environment.

The environment is an excellent resource for students in learning. The environment can be in the form of habits, social environment, local culture, and so forth. Mathematics learning with a cultural approach can not only instill the values of local wisdom of the culture in students but also because the learning will begin based on students 'initial knowledge and will also use what is a part of students' daily lives, namely the culture, the learning will be more meaningful. This is reinforced by the opinion of Arisetiawan [1] who explains that to help the children masterng more formal mathematics, learning mathematics in schools must start from the local culture that develops around. What is close to the lives of students who have a cultural context can be called local content.

Local content can be interpreted all the potential and work in an area that is characteristic of the area. This local content also means that natural and human resources are found in an area. This local content is a combination of knowledge, skills, independence, and ability to adjust education to the actual conditions in each region. So that learning becomes actual and leads to solving problems faced by local

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communities. In order to motivate students to solve a given problem, the researcher wants to associate the mathematical problems given to students by associating something close to students.

Furthermore, this study was carried out at SMPN 17 Pesawaran, with the reason that mathematics teachers tend to be less optimizing the students' mathematical thinking abilities in learning, especially higher-level thinking skills, namely reflective thinking skills. In addition, in this study triangles and rectangular material were chosen, because the rectangle and triangle material is one of the mathematical material relating to the application of daily life which is very suitable when it is related to the local content of the local area. Cacao is one of the leading plantation commodities in Lampung Province which is spread in almost all regencies in Lampung Province. One area in Lampung Province that makes cocoa a mainstay plantation commodity is Pesawaran Regency. The superiority of Pesawaran Regency which makes it one of the centers of community plantations specifically for cocoa commodities, is because the majority of the people in Pesawaran Regency rely on their income from cocoa farming. Based on the background above, the researchers are interested in conducting research on "Reflective Thinking Processes of Students in Solving Mathematical Problems of Triangles and Rectangular Material".

2. Research Methods

This type of research used in this study is a descriptive study using a qualitative approach because the data generated will be presented in the form of sentence descriptions. The description in question is about the reflective thinking process of students in solving mathematical problems with two-variable linear equation systems.

The subjects of this study were students of 8 C grade in odd semester of SMP Negeri 17 Pesawaran. Based on existing data, out of 32 students who took the test and then selected 5 students who took part in the interview. Where the five subjects are students who fullfill all the indicators of reflective thinking. The instruments used in this study were question sheets and interview guidelines. Then the two instruments are validated. The validation of the instrument was carried out by three validators, namely 2 mathematics education lecturers and the teacher of 8 C grade at SMP Negeri 17 Pesawaran.

Data collection was carried out in this study by providing written tests in the form of a description of the subject matter of Triangle and Rectangular. The test is done once in the form of a written test, the test is given to all students without exception. After the written test is finished, an interview is conducted which aims to find out the students' thinking processes in solving math problems. The selection of interview subjects was carried out based on the results of the written reflective thinking students 'test results along with the researchers' observations.

The data obtained were analyzed using the indicator guidelines that have been created to obtain student data that can be subject to interviews. Indicators of reflective thinking in solving math problems are as follows:

Table 1. Indicators of Reflective Thinking in Solving Mathematical Problems

Deskripsi Fase Berpikir Reflektif
1. Reacting (reflective thinking for action), in this phase things must carried out by students are: a. Mention what is known. b. Mention what is asked. c. Mention the relationship between the questioned and the known. d. Being able to explain what is known is enough to answer the question. e. Mention or explain the methods that are considered effective for solve the problem.

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2. Comparing (reflective thinking for evaluation), in this phase students do the following:
   a. Explain the answers to the problems found.
   b. Linking the problem in question with the SPLDV problem that was encountered.
   c. Linking the problem in question with the problem that has been faced.
3. Contemplating (reflective thinking for critical inquiry), in this phase students do the following:
   a. Determine the intent of the problem.
   b. Detect the truth in determining answers.
   c. Detects if an error occurs in determining the answer.
   d. Correct and explain if an error occurs from the answer
   e. Make conclusions correctly.

3. Research Results and Discussion

Based on the analysis of the data that has been done, it is known if the S1 subject in fulfilling the Reacting phase in questions number 1, number 2, and number 4 is able to express in his own sentence in accordance with the interview as well as being able to mention the known, mentioning the questioned, can also mention the relationship between those who are asked with what is known, able to explain what is known is sufficient to answer what is asked, and can mention the methods that are considered effective for S1 subjects to use. In fulfilling the Comparing phase, S_1 subjects are able to explain the answers to problems that have been resolved in accordance with interviews, can also explain the relationships and relate the problems that S_1 subjects have faced with the problems currently she get. Then in fulfilling the Contemplating phase, S_1 subjects can make the conclusions in accordance with the interview. For question number 3, S_1 subject can also fulfill the Reacting phase with her own sentences in accordance with the interview, in the Comparing phase she can only explain the completion. Then in fulfilling the Contemplating phase, S_1 subjects can make the conclusions in accordance with the interview. From the problems of questions number 1 to number 5 it can be concluded that for the process of thinking in solving math problems is reflective.

S_2 subjects in fulfilling the Reacting phase in questions number 1 and number 4 are able to express in her own sentences in accordance with the interview as well as being able to mention the known, mentioning the questioned, can also mention the relationship between the asked and the known, able to explain what is known is sufficient to answer what is asked, and can mention methods that are considered effective for her to use. In fulfilling the Comparing phase, S_2 subjects is able to explain the answers to the problems that have been resolved in accordance with interviews, can also explain relationships and relate problems that S_2 subjects have faced with the problems that she is currently getting. Then in fulfilling the Contemplating phase, S_2 subjects can make conclusions that are appropriate for the interview.

For question number 2, the S_2 subject can also fulfill all the Reacting phases with her own sentence in accordance with the interview, in the Comparing phase the S_2 subjects can only explain the settlement again. Then in fulfilling the Contemplating phase, the S_2 subject can make conclusions in accordance with the interview, able to detect the truth of the problem answers correctly and can correct problems if there are errors. Whereas for question number 3, the S_2 subject only fulfills the Reacting phase which is able to express in her own sentence in accordance with the interview as well as being able to mention the known, mentioning the questioned, can also mention the relationship between the asked and the known, able to explain what is known is sufficient to answer what is asked, and can mention methods

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that are considered effective for her to use. From the problems of questions number 1 to number 5 it can be concluded that for the thought process of solving mathematics problems the S_2 subject is quite reflective.

S_3 subject in fulfilling the Reacting phase in questions number 1 to number 5 is able to express in his own sentence in accordance with the interview as well as being able to mention the known, mentioning the questioned, can also mention the relationship between the asked and the known, able to explain what is known is sufficient to answer the question, and can name a method deemed effective for him to use. In fulfilling the Comparing phase, S_3 subjects is able to explain the answers to the problems that have been resolved in accordance with the interview, can also explain the relationship and relate the problems that the S_3 subject has faced with the problems that he is currently getting. Then in fulfilling the Contemplating phase, he can make conclusions in accordance with the interview, able to detect the correct answers to the problems correctly and can correct problems if there are errors. From the problems of questions number 1 to number 5 it can be concluded that for the process of thinking in solving math problems S_3 subjects are reflective.

S_4 subject in fulfilling the Reacting phase in questions number 1 to number 5 is able to express in his own sentence in accordance with the interview as well as being able to mention the known, mentioning the asked, can also mention the relationship between the asked and the known, able to explain what is known is sufficient to answer the question, and can name a method deemed effective for him to use. In fulfilling the Comparing phase, subject S_4 is able to explain answers to the problems that have been resolved in accordance with the interview, can also explain the relationship and relate the problems that the subject S4 ever faced with the problems currently subject S_4 get. Then in fulfilling the Contemplating phase, subject S_4 can make conclusions in accordance with the interview, able to detect the truth of the problem answers correctly and can correct problems if there are errors, no need to correct answers if there is nothing wrong. From problem number 1 to number 5 it can be concluded that for the process of thinking in solving mathematics of S_4 subject is reflective.

S_5 subject in fulfilling the Reacting phase in questions number 1, number 2, and number 4 is able to express in his own sentence in accordance with the interview as well as being able to mention the known, mentioning the questioned, can also mention the relationship between the asked and the known, able to explain what which is known to be enough to answer the question, and can name a method deemed effective for him to use. In fulfilling the Comparing phase, S_5 subject is able to explain the answers to the problems that have been resolved in accordance with the interview, can also explain the relationship and relate the problems that he has faced with the problems currently subjected. Then in fulfilling the Contemplating phase, S_5 subject can make conclusions in accordance with the interview, able to detect the truth of the answer to the problem correctly and can correct problems if there are mistakes. For questions number 3 and number 5, S_5 subject can also fulfill the Reacting phase with his own sentence in accordance with the interview, in the Comparing phase the S_5 subject can only explain the settlement again. Then in fulfilling the Contemplating phase, the S_5 subject can make the conclusions in accordance with the interview, able to detect the truth of the problem answers correctly and can correct problems if there are errors. From the problems of questions number 1 to number 5 it can be concluded that for the process of thinking in solving mathematical problems S_5 subject is reflective.

4. Conclusions and Recommendations

Based on the results of data analysis and discussion, about the reflective thinking process of 8 C grade it can be concluded that the thinking process of 8 c grade is reflective and quite reflective. Students who have reflective thinking processes, in problems number 1 through number 5 can FULLFILL the Reacting, Comparing, and Contemplating phases.

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While the students who have sufficiently reflective thinking processes fullfill the Reacting phase, the Comparing phase and the Contemplating phase in questions number 1 and number 4. For questions number 2, they can also fulfill all the Reacting and Contemplating phases, but the Comparing phase can only explain the settlement again. As for question number 3, it only fullfill the Reacting phase. As for suggestions for the teachers to be better recognize the phase of students' reflective thinking processes during learning, especially in solving mathematical problems. In addition for schools, the results of this study can be used as a consideration for students' reflective thinking processes to optimize their learning strategies. And for further researchers, it can be used as a reference in conducting similar research both in the development of instruments or using triangular and rectangular material.

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