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Reflective Thinking Ability of Junior High School Students of 2 Pleret Viewed from Self-Confidence

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Abstract

Reflective thinking ability is the ability of students to answer a given problem actively and carefully to obtain a more appropriate solution. This study is set to determine the reflective thinking ability of junior high school students in solving mathematical problems viewed from self-confidence. This research employs descriptive qualitative methods using questionnaires, written tests, and interviews in collecting the data. The subjects are six students of eight grade of State Junior High School 2 Pleret. In selecting the subjects, the researchers use a questionnaire that divides students into three categories namely, high, moderate, and low self-confidence. The results reveal that students with high self-confidence already have reflective thinking ability because they can understand the information well and be careful in solving problems. The students with moderate self-confidence have not been able to evaluate the problems because they do not carefully recheck the obtained answers. The students with low self-confidence can't identify problems clearly and correctly, can't remember their initial knowledge to solve new problems, can't evaluate problems, and can't draw conclusions from a given problem.

Keywords: *Thinking Ability; Reflective Thinking; Self-Confidence*

Introduction

In the era of the industrial revolution 4.0, science and technology develop rapidly. It can't be separated from the role of mathematics as one of the basic sciences. The development itself is followed by complex challenges. As a consequence, students' ability to solve mathematical problems is required (Toraman, 2020). The students require higher-level thinking ability to solve mathematical problems; one of the high-level thinking abilities that can be utilized to solve mathematical problems is reflective thinking (King, 2004).

Reflective thinking is a part of the active and careful self-regulation of students in performing complex tasks to obtain a precise completion (Ghajargar, 2018; Kashinath, 2013; Leung, 2008). For example, students can evaluate themselves in solving problems (Schaaf, 2013; Agustan, 2017). Reflective thinking is a way of thinking systematically, to make meaning out of experiences and relate it to new problems (Ghanizadeh, 2016). Reflective thinking can improve students' achievement and success in

learning mathematics (Ghanizadeh, 2016). Besides, it can encourage students to develop strategies for solving complex problems, reflective thinking can significantly enhance mathematical problem-solving ability (Demirel, 2015; Porntaweekol, 2015). It also helps students to develop high-level thinking ability by encouraging them to contextualize new knowledge with previous experiences (Dewey, 1993).

In recent years, reflective thinking is a very popular term in education (Lim, 2011; Amidu 2012). In Indonesia, reflective thinking has not yet developed optimally (Salido, 2019). Even though, it is one of the very important aspects that must be mastered by students to achieve the thinking ability in learning mathematics (Ayazgok, 2014). However, there are other influencing factors to achieve the thinking ability in learning mathematics, one of which is self-confidence (Hanula, 2004). Self-confidence is an attitude that enables individuals to have a positive but realistic view in every situation. Confident people can control their lives, and believe that they can do what they plan (Reddy, 2014). Confidence is defined as believing in one's abilities, daring to express opinions, not relying on others, being optimistic, and being responsible for solving problems (Goel, 2012; Otacioglu, 2008). Students who have good confidence can succeed in learning mathematics (Kosim, 2020), while students with low confidence tend to be less successful in learning mathematics (Telbis, 2014) so that confidence is considered crucial to support students' reflective thinking ability in mathematics learning. This research aims at finding out the reflective thinking ability of Junior High School Students of 2 Pleret viewed from high, moderate, and low self-confidence.

Methodology

This research employs a descriptive qualitative method. It conducted at State Junior High School 2 Pleret with 28 students of class eight. In selecting the subjects, the researchers use a purposive sampling method. The chosen subjects are 2 out of 10 students who have high self-confidence, 2 out of 12 students with moderate self-confidence, and 2 out of 6 students with low self-confidence.

Data collection techniques are in the form of written tests with the material of relations and functions that have been learned by the students. Written tests are utilized to determine students' reflective thinking ability in solving problems. The interview is conducted in a semi-structured manner to explore deeply how students' reflective thinking ability. There are five questions in written tests that cover several indicators namely describing the problem, identifying the problem, drawing an analogy from two problems, evaluating the problem, and drawing conclusions.

Results and Discussion

The data in this study are obtained from self-confidence questionnaires, students' written test answer sheets, and the clarification process with interviews. The results of the written test of the reflective thinking ability of students in eight grade in solving problems are presented in Table 1.

Table 1. The Results of Students' Written Test of Reflective Thinking Ability

Self Confidence Category	Student	Item 1 Describing Problem	Item 2 Identifying Problems	Item 3 Drawing an Analogy of Two Problems	Item 4 Evaluating Problems	Item 5 Drawing Conclusions
High	S1	✓	✓	✓	✓	✓
	S2	✓	✓	✓	-	✓
Moderate	S3	✓	✓	✓	-	✓
	S4	✓	✓	-	-	✓
Low	S5	✓	-	-	-	-
	S6	✓	-	-	-	-
Total Students		6	4	3	1	4

Table 1 shows that there are some differences in answering questions between subjects who have high self-confidence (S1) (S2), moderate (S3) (S4), and low (S5) (S6). The difference is seen among others from the students' answer sheets about reflective thinking skills. 6 students fulfill 'describing the problem' indicator; 4 students who fulfill 'identifying the problem' indicator; 3 students who fulfill 'drawing an analogy of two problems' indicator; 1 student who fulfills the indicators of evaluating the problem; and 4 students who fulfill the indicators of drawing conclusions.

Table 2. The Results of Interview

The Level of Students' Self-Confidence					
High		Moderate		Low	
S1	S2	S3	S4	S5	S6
• Understand question well • Can explain the completion step • Can Recall initial knowledge • Can recheck the answers	• Understanding questions well • Can explain the completion step • Can Recall initial knowledge • Can't recheck the answers	• Understanding questions well • Can explain the completion step • Can Recall initial knowledge • Can't recheck the answers	• Takes long time to understand questions • Takes long time to explain the completion step • Can't Recall initial knowledge • Can't recheck the answers	• Has difficulty to understand questions • Has difficulty to explain the completion step • Can't Recall initial knowledge • Can't recheck the answers	• Has difficulty to understand questions • Has difficulty to explain the completion step • Can't Recall initial knowledge • Can't recheck the answers

Based on Table 2, there are several categories of students' thinking in answering questions that include understanding the questions and planning completion strategies, explain the solution, remember initial knowledge to solve new problems and recheck completion steps.

Reflective Thinking Ability of Students with High Self-Confidence

Based on the results of tests and interviews, S1 has been able to describe the problem. It can be seen from the way S1 solves the first problem. It is also supported by his answer in an interview, which explains that S1 can answer the question well and be careful in understanding the given problem. S1 can

identify the second problem precisely. Besides, S1 can explain the second completion correctly. He can draw an analogy from two similar problems of number four. It is also supported his answer in an interview that he can remember initial knowledge that was previously obtained in solving new problems. He can evaluate the problem given; it can be seen that S1 can re-examine the results of the settlement precisely and confidently. He can deduce the problem given; it can be seen when he can make a decision by solving problem number 5.

The same analysis shows that S2 can describe the given problem, it is proved when he mentions the known issue, the asked problem, and solve the question correctly. S2 can identify problems related to the domain, codomain, and range of a relation correctly. S2 can draw an analogy from two similar problems by remembering material that has been well studied before. S2 has been trying to solve the given problem, but He has not been able to evaluate the problem because he does not re-examine the answer. S2 can conclude a given problem seen from the answers that S2 can solve problem number 5 and answer the given questions with confidence.

Reflective Thinking Ability of Students with Moderate Self-Confidence

The student who has moderate self-confidence is S3. He can describe problems related to relation. It can be seen from the answer sheet that S3 can answer question number 1 supported by interviews that S3 answers questions confidently and the problem solving is correct. S3 can identify problems related to the domain, codomain, and range given in problem number 2. It is proved by the answer sheet that S3 can solve problem number 2 and understand it. S3 can draw an analogy from two similar problems seen from students' answer sheets and during interviews that S3 can associate problems that they have previously learned with confidence. S3 can't evaluate the problem, because he does not re-check the results of its settlement, resulting in the obtained answers are not precise. S3 can conclude a given problem, this is seen when he can answer questions number 5. Besides, He can explain how to make conclusions appropriately.

The results of the analysis show that S4 can describe problems related to relations and functions because he can solve problem number 1. S4 can also identify the given problem, seen when he can find out the obtained information, and relate it to the given questions. However, S4 can't draw an analogy from the two problems given because S4 can't remember problems that have been studied previously to be used in solving the given problems. S4 also unable to evaluate the given problem, although S4 has tried to solve problem number 4, S4 does not re-examine the answers that have been obtained so that he does not know if the answer is still wrong. S4 can conclude the given problems seen when he can make conclusions from problem number 5.

Reflective Thinking Ability of Students with Low Self-Confidence

The results of the analysis on S5 who has low self-confidence show that he can describe the given problem, even though he takes a little longer to understand it. It can be seen from the interview, S5 seems a little confused when he is asked the obtained information. S5 can't identify the given problem, it can be seen from the answer sheet of S5 on problem number 2 that there is no solution, and when he is interviewed, and he states that he does not remember the concept of a domain, codomain, and range. This causes that S5 can't identify problem number 2. S5 also can't draw an analogy from the same two problems, it can be seen from his inability in answering question number 3, and he explains that he can't remember the initial knowledge to solve the given problem during interviews. S5 also can't evaluate the given problem; this can be seen from the answer sheets that he does not re-check the answers, and S5 only assumes that the obtained answer is correct without re-checking the answers. S5 can't conclude the given problems, this can be seen from his inability in making conclusions from problem number 5, and S5 seems confused to make conclusions from existing information during the interview session.

Similar to S5, S6 is only able to describe the given problem, it can be seen from the results of students' answers that he only can answer question number 1 with an indicator of describing the problem. In the interview process, S6 looks a little confused in understanding the problem and takes a long time in answering questions; He also feels not so sure about his work. S6 can't identify the given problem because he does not answer question number 2 at all. S6 also can't draw an analogy from the same two problems because he does not answer question number 3, and he is unable to remember initial knowledge related to the new problems. S6 can't evaluate the problem because he can't solve the given problem related to checking the truth of the answers that have been done. S6 also can't conclude a given problem because no conclusions are made for problem number 5.

Based on the results of the analysis and interviews of the six students, it is obtained that the students' reflective thinking ability in solving problems is still not optimal. It is proved that the students are still unable to solve the given problem thoroughly, especially in the indicator of evaluating the problem, because they do not recheck whether the answers already obtained are correct or not. Some students also can't identify the given problem, and there are some students also can't draw analogies from the two similar problems because they can't recall experiences that have been previously learned in solving new problems. In line with research that has been done, the students' reflective thinking is still low because it is still not accustomed to the students (Sabandar, 2013; Guroll, 2011). Even though reflective thinking ability can support students in choosing and considering the decisions that must be taken to take appropriate actions, so they are expected to have high reflective thinking skills in learning mathematics (Martyaningrum, 2020).

Conclusion

Based on the results and discussion, it can be concluded that the students of State Junior High School 2 Pleret with high confidence have reflective thinking ability because they meet several indicators, such as understand the information well and be careful in solving problems, remember initial knowledge to solve new problems, recheck the obtained answers, and make conclusions from a problem. Even though, there are still some students who can't evaluate the problem carefully and correctly. The students with moderate self-confidence can't evaluate the problem because they are not careful in rechecking the obtained answers, and some students can't recall initial knowledge in solving new problems. The students with low self-confidence are unable to identify problems clearly and correctly, unable to remember initial knowledge to solve new problems, unable to evaluate problems, and unable to conclude the given problems.

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