

The Effect of a Realistic and Critical Mathematical Approach towards the Resolution of the Problem of Mathematics Class V Documentary Schools Graduate 3 Substance of Tangerang

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Abstract: This research aims to know the influence of the application of mathematical approach is realistic and critical thinking towards problem-solving ability of grade V primary school in Tangerang. This type of research is to experiment with the use of the technique of simple random sampling has been done to 60 students. Retrieval of data obtained through tests and analyzed using the variant analysis (ANAVA) two lanes with a design treatment by level 2 x 2. Research results showed: (1) problem solving Ability among students who are taught using realistic mathematical approach higher than students taught using conventional methods, (2) there is the influence of the interaction between the application realistic mathematical approach to critical thinking and problem-solving abilities, against (3) problem solving Ability among students who are taught using realistic mathematical approach higher than students taught using methods the conventional group of students who have a high, critical thinking and (4) problem solving Ability among students who are taught using conventional methods is higher than students taught using a mathematical approach is realistic on a group of students with critical thinking. The results of this research show that the mathematical approach with a realistic critical thinking was able to increase the ability of solving math problems.

Keywords: Realistic Mathematical Approach, Critical Thinking, Problem-Solving Ability.

INTRODUCTION

Education is a very important aspect in the progress of a nation. This is due to the advance or retreat of a nation and the country is influenced by the quality of human resources that become the backbone of the country. Quality human resources is the result of an educational process because without education it is impossible to obtain qualified human resources that can build the nation and the country towards the goals to be achieved by the nation and state. The goal of modern national education is to create a nation that is not only smart, but also creative, critical, innovative and productive so as to be able to face global competition. Generations of nations born of national education are expected to have skills in accordance with their respective talents and interests. Because life skills in the era of globalization is no longer viewed from academic value or learning outcomes alone, but also judged by how a person is able to survive the problems of life that will come [1].

Mathematics education in Indonesia continues to grow in line with the demands of technological and scientific development. From the beginning until now, mathematics is a science learned by many people in this world, it can not be denied that people always use

mathematics in everyday life both from the simple things to the most complicated things. Therefore, mathematics should be taught to learners ranging from elementary school level to college level [2]. Mathematics learning has been less concerned with the development of mathematical problem solving abilities. This is caused by students who are less able to find the concept of mathematics so that less apply mathematics in problem solving. In addition, students are also given less opportunity to express ideas and decisions in the learning process [1].

In everyday life, everyone can not be separated from something called problem. A problem usually contains something that encourages someone to solve it but not directly someone can solve it. If a problem is given to a child and the child immediately knows how to solve it correctly, then the problem can not be said as a problem. A question will be a problem only if it indicates a challenge that can not be solved by routine procedures already known to the student. Therefore, problem solving is a major focus in mathematics learning. In general, problem solving is a cognitive process of transforming a condition that must be solved to a particular goal when the person facing it does not necessarily realize there is a way to solve it [3].

Students can be categorized to solve problems by meeting indicators. Problem-solving indicators according to NCTM are: (1) Applying and adapting various approaches and strategies for solving problems, (2) Solving problems that arise in mathematics or in other contexts involving mathematics, (3) Building new mathematical knowledge through solving problems, and (4) Monitoring and reflecting on the process of solving mathematical problems. From these indicators it can be seen that students can solve problems if able to use various strategies to solve problems in mathematics or in other contexts involving math, so that students can build new knowledge through problem solving. Conversely, if students can not solve the problem students do not meet the categories contained in the indicator [4].

In fact, to develop problem solving abilities that existed in the objectives of mathematics learning in elementary schools has not yet shown satisfactory success [5]. The ability to solve problems is very important in everyday life. With students having problem-solving abilities allows students to tackle life's challenges. Therefore, teachers should provide a problem - a problem that is rich in problems that are still associated with daily life - the day students. In the course of the exercise questions, students are only required to get the answer so that when students are given problems in the form of a matter - the story, students tend to have difficulty solving it. Therefore, students are not familiar with issues that can develop logical, analytical, systematic, critical, and creative thinking skills. That's what makes the problem-solving ability of students has not been maximized because students are not required to think critically [6].

By thinking critically one can process the existing information with a logical, so that students will be able to solve life problems with critical. This becomes important because nowadays students generally become passive followers in every activity or problem around students. Students only argue and seem "search for the truth" without knowing exactly what and why it can happen and what students can do to overcome it. So from the case shows that Indonesian education graduates still have a low level of thought complexity. This can be a consideration for bringing about a learning approach that includes problem solving and producing problem-solving students [2].

In general, mathematics learning in elementary schools is still teacher-centered and has not centered on students, students just sit still, listen, record formulas, and at the end of student learning work on questions based solely on the teacher's formula give, while the teacher lectures more and explains the material. It is these circumstances that make the student less active, not critical, and not creative in the learning that makes

students feel bored, and ultimately the learning becomes meaningless, and unpleasant [7].

Such learning can hamper the potential growth of thinking, reasoning, communicating, and problem solving skills. The teacher's knowledge of the variety of methods, the less-developed learning approach also supports the problem solving ability of the students become less developed. Therefore, it is necessary that there is a method or learning approach that can train students 'critical thinking skills so as to develop students' mathematical problem solving abilities. To overcome this need to be a good learning process, namely learning where interaction occurs between teachers and students, students with students, as well as students with learning resources in a learning environment oriented to student self-development, in the form of knowledge development (cognitive affective), and students' (psychomotor) skills as learning objectives. Teachers should further adapt the materials and approaches used in mathematics learning to the characteristics of elementary students who are still at a concrete operational stage[8].

A number of information problems are raises the mind of the author to find a solution that is required a more innovative approach. This approach is Realistic Mathematic Education (RME) or better known in Indonesia with Realistic Mathematics Approach Indonesia (PMRI) [2]. The Realistic Mathematics Approach (PMR) is one approach that educators or educators can use as an innovative approach. According to Dolk in Yusuf Hartono, the approach of realistic mathematics is one of the learning approaches developed to bring mathematics closer to the students [3]. This approach is based on Hans Freudenthal's assumption that mathematics is a human activity. According to this approach, mathematics learning is not where mathematics moves from teacher to student, but where students rediscover mathematical ideas and concepts through exploration of real problems. Here mathematics is seen as a human activity that begins with problem solving [9].

Critical thinking is a person's ability to analyze and evaluate information or data. In critical thinking students are required to use certain appropriate cognitive strategies to test the truth, solve problems, and overcome problems and shortcomings. Each student has different critical thinking skills. There are students who have low critical thinking skills and there are also students who have high critical thinking skills[10-16]. Critical thinking will shape students into someone who will have a higher curiosity and desire to seek out the truth or they will seek solutions from the subject matter they get. Thus, the students themselves can rediscover the mathematical concept with teacher guidance. Furthermore, students will apply the concept if it finds problems in everyday life and solve the problem.

Therefore, the authors are encouraged to conduct research entitled "The Influence of RME Approach and Critical Thinking on Mathematical Problem Solving Ability Primary school students.

METHOD

In conducting this research, the writer used quantitative research method with design design experiment design treatment by level 2x2 [17]. Quantitative methods are also referred to as scientific or scientific method because it has fulfilled the scientific principles that are concrete or empirical, objective, measurable, rational, and systematic [8]. Variables in this study consist of independent variables and dependent variables. As for the independent variable (X1) is the Realistic Mathematics Learning Approach and the independent variable (X2) is high and low critical thinking. While the dependent variable (Y) is the problem-solving ability.

Researchers took the object of research at elementary school Cikokol 1 Tangerang. The purpose

of the researcher to take the location to obtain the value data from the test given after the teaching and learning process is carried out, conducted in two classes namely class V A ie students who learn by using Realistic Mathematics Learning Approach and class V B that is students using conventional methods. The population used in this research is class V in elementary school Cikokol 1 Tangerang on mathematics subjects with the number of students 60 students. The sampling technique in this research is using random sample technique or random. The sample in this study amounted to 60 people divided into two classes, class V A numbered 30 people and class V B amounted to 30 people

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The results of hypothesis testing with tukey test as follows:

Table-2: Hiotesis Testing

| No | Hipotesis Statistik | Q _{Hitung} | Q _{tabel} (α = 0,05) |
|----|---------------------------|---------------------|-------------------------------|
| 1. | $\mu_{A1B1} > \mu_{A2B1}$ | 14,65* | 4,70 |
| 2. | $\mu_{A1B2} < \mu_{A2B2}$ | 7,88* | 4,70 |

Based on the results of the Analysis of Variance and Tuckey's advanced test above, it can be stated that: The problem solving skills taught by realistic mathematics learning approaches with higher critical thinking are higher than the problem-solving skills taught by conventional methods with low critical thinking, received significantly at α = 0,05. The problem-solving skills taught by realistic mathematical learning approaches with low critical thinking are less than the problem-solving skills taught by conventional methods with low critical thinking, are received significantly α = 0,05.

DISCUSSION

From result obtained between treatment class and control class can be concluded that there is difference between treatment class and control class hence can be concluded that there is difference between treatment class with average value of control class when executed pre-test is 4,40 and the mean value average at the time of post-test is 7.88. While the average value of the experimental class during pretest is 7.65 and after the post-test, it turns out that the average value does not change, that is still at 8.77. Can be seen the difference between the two classes, the experimental class is more significant than the control class, this is because the application of realistic mathematics learning model at the time of learning mathematics in the experimental class.

The activity of students who experienced an increase caused by the use of concrete media with the model of learning realistic mathematics students follow the learning with enthusiasm, so that students can understand the material given in learning by using tools sedehana and working on the questions given in groups with the spirit and confidence, in learning students do not find it difficult when solving problems because the learning materials are associated with their daily life experiences. This is consistent with the characteristics of the Realistic Mathematics Education (RME) learning model in the theory proposed by Treffer [16] that mathematics learning should use meaningful real context or situations imaginable in the minds of students. Through the use of context, students are actively involved in conducting exploration activities so that students' motivation and interest in learning math.

Thus learning activities are mostly student-centered Students play an active role in learning, while teachers as mentors and facilitators when learning takes place in the classroom. This is the ultimate characteristic of the realistic mathematics learning model. This is what proves that the use of realistic mathematics learning model can improve problem solving ability and student learning activities that can finally fulfill the achievement of minimum criterion (KKM) of students.

CONCLUSION

Based on the results of research conducted by researchers on the influence of the use of realistic mathematics learning approach and critical thinking on problem solving skills in the field of study of class V mathematics in elementary school Cikokol 1 Tangerang, can be drawn conclusion as follows:

- Student problem solving skills that are taught realistic mathematics learning approaches are higher than those taught by conventional methods.
- There is an interaction effect between realistic mathematics learning approach and critical thinking on problem solving ability.
- Student problem-solving skills in groups of students who have high critical thinking taught realistic mathematics learning approaches are higher than in the group of students taught conventional methods.
- Student problem-solving abilities in groups of students with low critical thinking taught by conventional methods are higher than in the group of students taught realistic mathematics learning approaches.

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