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THE IMPROVEMENT OF THE MATHEMATICAL PROBLEM SOLVING ABILITY AT MTsN 2 THROUGH REALISTIC MATH APPROACH

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ABSTRACT

This study aims to see an increase in problem-solving ability is good for flat wake topics in class VII MTsN 2 field. This research is quasi experiment. The population was students MTsN 2 field. The sample selection is done randomly to randomize the class. Class VII (1) as an experimental class treated realistic math approach and class VII (5) as a control class treated regular learning. The instruments are: problem solving ability test, Analysis of the data is done by t test and ANOVA two lanes. The results of this study is to increase the ability of mathematical solving problems obtaining math realistic approach higher than students who used the regular learning. Based on these results, the researchers suggested that realistic mathematics learning in the learning of mathematics can be used as an alternative for teachers of mathematics to improve creative thinking and problem-solving mathematics students as an alternative for implementing innovative math learning.

Keyword: *realistic math approach, mathematical problem solving ability*

INTRODUCTION

In the content standards for elementary and secondary education mathematics study (National Education Minister Regulation No. 22 of 2006 about the contents) has stated that the mathematics study should be is given to all students ranging from elementary school to equip students with the ability to think logically, analytical, systematic, critical, and creative, as well as the ability to cooperate. Competence is needed so that learners can have the ability to acquire, manage, and use information to survive in an ever-changing circumstances, is uncertain, and competitive.

Mathematics is the result of human brain with that general truth (deductive). The truth does not depend on the scientific method containing inductive process. Mathematical truths is coherently. As is known in the world of science, there are three kinds of truths: (1) the truth of coherence or consistency, that is the truth based on the truths that have previously received, (2) correlation truth, which is based on the "compatibility" with reality or the fact that there is, and (3) the pragmatic truth, that truth which is based on the benefit or usefulness (Salah, 1988).

On the other hand, mathematics as a science actually have diverse interpretations. Therefore, mathematics is taught in schools also part of the math, so with the kind of characteristics and mathematical interpretation, important to learning in school. By

understanding the character of mathematics, teachers are expected to take a proper attitude in mathematics. Furthermore, teachers should be understand the limitations of the mathematical properties that learned to their students. Do not let the math teacher sees only as a mere collection of formulas, nor just a thought process alone. Comprehensive understanding of mathematics will enable teachers to better organize learning.

Learning of mathematics in school is a process or activity a teachers, that it contains the efforts of teachers to create a climate and services on the ability, potential, interests, talents and needs of students of mathematics is very diverse so that the optimal interaction between teachers and students and between students and the students in learning mathematics.

Hudoyo (1990) say that a person is said to learn math, if in that person going on an activity that can lead to changes in behavior related to mathematics. These changes occur from not knowing a concept of math to knowing , and is able to use it in study material or in everyday life.

Learning mathematics is essentially not only on the level of recognition and understanding, but also aspects of the application or the ability to apply or apply the concepts and material that is or has been learned to solve any problems encountered in mathematics itself, other sciences as well as problems in daily life. So that who learning mathematics with the applicable capabilities will foster respect for the benefit of mathematics in life.

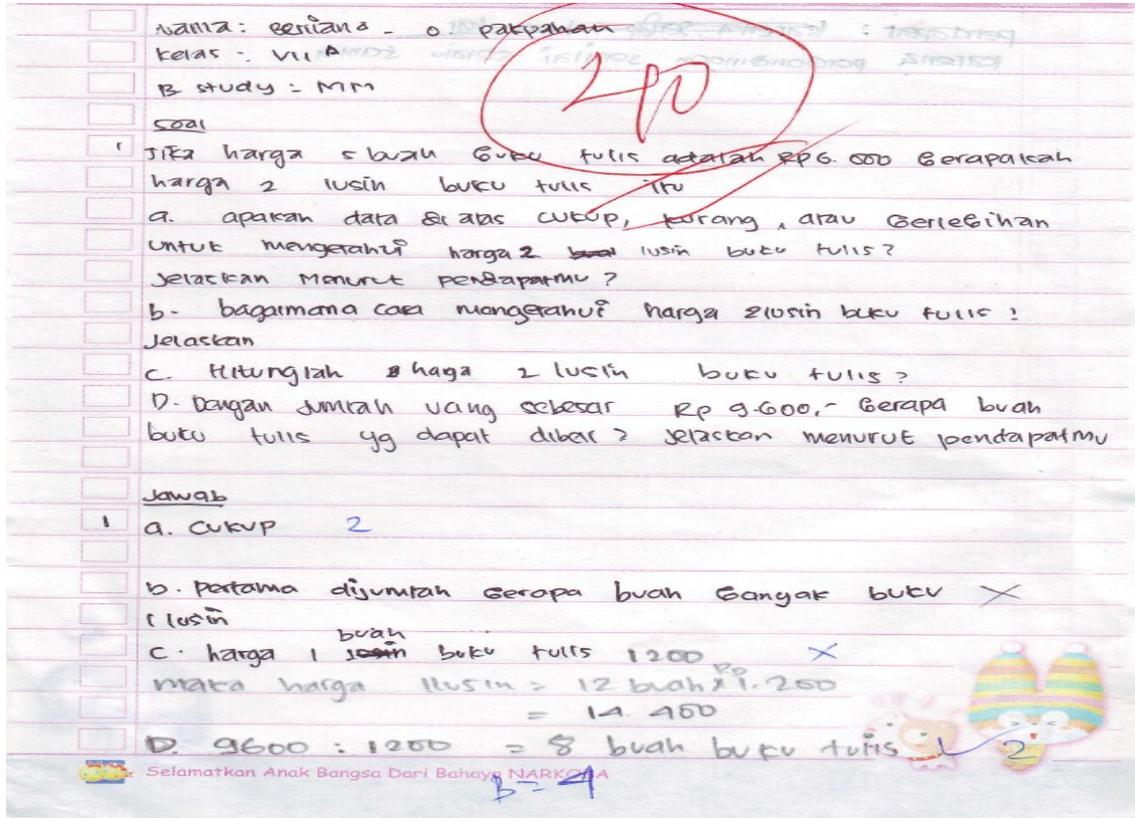
Wahyudin Research (1999) founded that the average level of mastery of math tend to be low. In detail, it was found that one of the tendencies that led to a number of students fail to master the fine points of discussion in mathematics that students do not understand and use good logic in solving a given problem or issue.

Many factors lead to low math problem solving ability of students, one of the factors according Zulkardi (2001): factors associated with learning in school, for example, methods of teaching mathematics that is centered on the teacher, while students to be passive. then, Wahyudin (1999) in his study also states that in the case of mathematics learning process, the teachers almost always use the lecture method and expository, so less trained even understanding mathematical problem solving ability.

According to the National Research Council (1989), that in fact all the mathematical skills based on mathematical understanding. Students who have that ability help him to develop how were you think and make decisions (Allen, 1992; Borasi& Rose, 1989; Burton &Morfa, 2000). Thus, build mathematical understanding can develop other mathematical abilities including problem-solving abilities.

One example , according assignment is worked by students of class VII 1MTs Negeri 2 Medan on January 10, 2013 at MTs 2 field, that shows the low mathematical problem solving

ability with the provision of preliminary test problem-solving skills to , o from 32 students, there are 27 students are not able to solve the problem means 84.3 % of students do not reach the KKM, one example of a student answer showed the following results:



Dated January 22, 2013 Researchers also to test the ability to solve problems, one of the problems that were tested are as follows: length of the hypotenuse of a right-angled segita equal to 4 cm. If the difference in length of the side of the elbow is equal to 4 cm, find the area of a triangle is right-angled. From the results obtained by 25 students from 32 students are not able to resolve the issue properly means 78.1% of students do not reach the KKM, dated February 16, 2013, researchers also conducted tests the ability to solve problems one question tested are as follows: Amir away from town A to B while Joko from city B to city A. They set off at the same time is 10:00 am. Amir departed from the city at an average speed of 60 km / h. While Joko went from town B with an average speed of 75 km / h. If the distance between town A to town B is 360 km. Determine at what time the two men met! From the results obtained by 24 students did not reach the minimum completeness criteria (KKM) of 32 students, this means that 75% of students are under KKM specified.

Accordngi of the twice test was given to student explain that class VII A difficulty in solving the problem above. From interviews and observations of some mathematics teacher at MTs 2 field that the root of the problem in learning mathematics are: 1) The material is abstrak.2

motivation of learning is lowly .3) Interaction between students in learning mathematics is not optimal.

Mathematical problem solving ability is very important goaling to be a general purpose even as the heart of mathematics, prefer the process rather than the result (Ruseffendi, 1991), and as the focus of school mathematics and to assist in developing mathematical thinking (NCTM, 2000). The process of thinking in problem solving requires a certain intellectual abilities that will organize strategy. It will train people to think critically, logically and creatively indispensable in dealing with the development of society (Sumarmo, 1994).

Diverse mathematics ability could affect students's ability to solve mathematical problems. Students who have high math abilities have a high problem-solving ability as well. It can also be assumed that students who have a low initial ability is taught by using realistic mathematical approach would have the problem-solving ability higher than students who have lower initial ability is taught using the usual learning.

The use of realistic mathematics approach will also affect the students' problem solving skills when compared with normal learning. Moreover, to compare students' problem-solving abilities that have high initial capability is taught by using the usual learning with students who have a low initial ability is taught by using a mathematical approach realistic. That is because the unknown which is more influential on students' problem-solving abilities, Is the beginning of the student's ability or learning model used. Thus alleged that, There is an interaction between prior knowledge of students (high, medium, low) with a realistic mathematical approach and the usual learning to students' problem-solving abilities.

Low ability of solving mathematical problems MTs 2 field can not be left alone so demanding settlement. Learning mathematics in MTs 2 field must transform themselves that emphasize the process skills. Thus, the learning of mathematics should choose a good learning approach and is not oriented to the conventional approach. Learning approach that is expected to shift the use of conventional approaches to learning and enable students mengkreatifkan in a learning process, especially in the learning of mathematics, including through approaches Realistic Mathematics Education (PMR).

As a learning model that is constructivist, realistic mathematical approach is expected to improve students' emotional intelligence than usual learning. However, the students cultivate emotional intelligence that uses a mathematical approach is not realistic irrespective of the diversity of conditions prior knowledge of mathematics students. The cooperation of these two variables affect the emotional intelligence of students with different effects of each variable.

PMR as one of the new approaches in the study of mathematics, also invites students mematematisasi contextual ie activities of students who developed the mindset of the things

that is concrete to the abstract things. Learning mathematics with a realistic approach is basically the use of reality and environment to facilitate the students understood the mathematics learning process so as to achieve the goal of mathematics education better than the past. Reality in question is the real thing or concrete that can be observed and understood the students to imagine, while the environment is a place where students are (Soedjadi, 2003). According to Fauzan (2001) "PMR provides the opportunity for us to act actively seek answers to the problems encountered and tried to check, seek and draw their own conclusions logically, critically, analytically and systematically. "This will encourage students to improve reasoning and thinking freely, openly happy it will deepen their knowledge independently so that students are able to solve problems in everyday life.

Mathematics learning process in schools is a complex process and comprehensive nature. Many people are of the opinion that in order to achieve high performance in learning, one must have the Intelligence Quotient (IQ) high, because intelligence is a potential provision that would facilitate the belajar . In fact, there are students who have a high intelligence capability but to obtain a relatively low learning achievement, but there are students who despite relatively low intelligence capabilities, can achieve a relatively high educational achievement. That is why the level of intelligence is not the only factor that determines the success of a person, because there are other factors that influence.

Through a realistic mathematical approach researchers expect to make any changes to the students of MTs Negeri 2 Medan particular class VII so that problem solving ability of students in learning mathematics can be increased. Based on the background that the author is interested in conducting research with the title Upgrades Troubleshooting Students MTs 2 Terrain Through Realistic Mathematics Approach.

Mathematical Problem Solving Ability. Problem solving ability is the ability of students in solving problems of non-routine, that is a matter that is in the process of completion does not have a fixed procedure and also requires the ability to think critically, creatively, and logical. According to Abdurrahman (2003) problem-solving ability in mathematics is the application of mathematical concepts and competencies associated with other knowledge. Hudojo (2001: 165) says that "As for solving the problem, simply, is the admissions process as a challenging problem to solve the problem". Stamatis (2002: 10) also states "*Traditionally, the term problem solving has been used to describe the behaviors applied by a motivated subject, attempting to achieve a goal, usually in an unfamiliar context, after initial lack of succes*".

According Hudojo (2001) solving the problem should be integrated into the teaching and learning of mathematics, because it teaches students to solve problems enable students to be more analytical in making decisions in life. As noted Lubis (2006: 206) that, "The ability of

students to solve the problem becomes one of the objectives of the study of mathematics as stated in the school mathematics curriculum". Ruseffendi (1980) explained why the questions need to be trained in problem solving to students. This is because the questions have character type problem solving; (1) can bring a sense of curiosity, passion, and creativity, (2) the terms of the science of grammar, verbal, and how to make a mathematical statement is true, (3) can cause settlements are original, unique, and with different viewpoints can add new knowledge, (4) increasing the application of knowledge that has been owned by the students, (5) invites siswa have troubleshooting procedures in their cognitive structure, is able to make a synthesis, analysis and evaluation of problem resolution is sought, and (6) stimulate students to use all the skills and knowledge as it relates to a variety of other disciplines.

Turmudi (2008) said that solving problems in mathematics involves methods and strategies that are not commonly used and has not been known before. To obtain the solution, the student must rely on knowledge, good knowledge of the material prerequisites and knowledge of personal experience. Through this process students will develop new mathematical understanding, thus solving the problem not only as the ultimate goal of learning mathematics, but also a major part of this process. Shaddiq (2004: 17) says that "the essence of learning to solve the problem is the students are accustomed to working on the problems that not only require memory, but also critical thinking, creative, logical and rational".

Not all of the questions posed to students is a problem. A problem usually includes a situation that encourages students to solve it but do not know directly what to do to solve it. According Hudojo (2001: 162) "An inquiry would be a problem only if it does not have a rule / law immediately certain that can be used to find answers to these questions". A question would be a problem if the question suggests a challenge that can not be solved by a routine procedure that is already known to the students. As Cooney in Shaddiq (2004: 10) that "... for the question to be a problem, it must present a challenge that can not be resolved by some routine procedures known to the student". Therefore it can happen that a 'problem' for the students will be 'questions' for the other students because he already knows the procedure to solve it or been faced with the 'question' which formerly was still a 'problem'.

According to Sofyan (2008) Problems are used to hone the student's ability to solve problems is an open problem (open-ended) and structured problems (well-structured). In an open problem solving, the problem should have a variety of alternative answers that may be obtained from a variety of methods and strategies completion. The center of attention is not on the answer or solution, but rather the way how the students arrive at the answer. In structured problems, to answer a given problem, students are exposed to subproblems-subproblems as a

guide to be able to answer the problem as a whole. The problem used in this study is structured problems.

There are no formulas, rules, or procedures routinely used in solving the problem. For students to solve problems presented by the teacher, teachers should guide students through several stages that must be passed students in solving problems. Ruseffendi (1980) concluded that the settlement of the question in the form of problem solving steps are as follows; (1) formulate the problem clearly, (2) restates the problem clearly in a form that can be completed, (3) formulate a hypothesis or conjecture temporary and solution strategies, (4) implementing resolution procedure, and (5) an evaluation of the settlement. Polya (1945) describes some of the steps used to solve the problem, namely; (1) Understanding the problem, (2). Devising a plan (3) Carrying out the plan, and (4). *Looking back*

Although it does not have a fixed procedure in the process of completion, but there are some strategies used in solving a problem. Walle (2007) says that there is a strategy that is often used in solving the problem, namely; (1) Create an image, use images, and use the model, which uses the image will expand the model to the real interpretation of the situation of the problem, (2) Look for patterns as patterns of numbers and operations play a very big role in helping students learn and master basic facts, (3) Make a table or diagram that are frequently combined with a search pattern in solving problems, (4) Try a simple version of the question due to finish easier question is expected to gain insights that can then be used to solve the problem , (5) try and check, one good strategy is used when confused as how to try that one can even lead to a better idea, (6) make a list of regular, where this strategy involves systematically counting all results may be in a situation with the aim of finding out how many possibilities exist or to ensure that all of the results that may have been calculated

Problem solving ability in this research is the ability of students in solving non-routine problems. The steps that must be performed by the students are; (1) understand the problem, (2) planning steps to resolve the problem, (3) carry out the process of finding a solution based on what has been planned, and (4) to re-examine the obtained solution. The fourth step would be an indicator of students' problem-solving abilities in this study.

METHODOLOGY

This research is categorized into a quasi-experimental study (quasi experiment). The design used in this study consists of three phases, namely: (1) the preparation stage of learning and research instruments, (2) the trial stage of learning and research instruments, (3) experimental implementation phase. Each stage is designed so that valid data obtained in accordance with the characteristics varabel accordance with the purpose of research.

The population of this study were all students of MTs Negeri 2 Medan. The samples were selected at random two-class (cluster random sampling). Stage random selection is made possible because based on information from principals and teachers and students at each grade distribution evenly distributed heterogeneous. This is in accordance with the opinion Russefendi (1998: 78) one way to choose a representative sample of the population is a simple random way, that is, if every member of the population has an equal chance to be selected. So the selection of the sample in this study is the numbering of each class on the paper and then do the lottery. Selected samples of two classes of class VII (1) and VII (5) then conducted a lottery to select a group of PMR approach is class VII (1), ie regular instructional classes elected VII (5).

Students in a class (experimental and control) was formed into three groups on the grouping siswaberdasarkan on 3 capabilities such as: high-ability students, medium and low.

RESEARCH RESULTS AND DISCUSSION

Results. Statistical hypothesis testing is done to examine whether there are differences in the ability of all aspects of students' problem solving and learning data group PMR Ordinary. The results obtained indicate that tcount of 3.57, whereas the values obtained ttable with degrees of freedom, $df (n-2) = 80-2 = 78$, and the test of the parties (0.05) is 2.38. Turns this > ttable, then H_a accepted, so it can be concluded that there are differences in the ability of all aspects of students' problem-solving groups Data PMR and Learning Fair. In other words, that based on the results of two different test average, posttest scores Troubleshooting capabilities PMR data group is better than the Ordinary Learning.

Discussion. The following discussion of the results of this study are based on the results obtained in the hypothesis testing and data analysis of the problem-solving abilities are as follows:

Learning factors. From the research that has been described previously demonstrated that with realistic learning significantly better in improving students' mathematical problem solving abilities compared to Learning Fair, as well as the process of resolving the problem of students who were taught with realistic learning model is better than the students problem-solving process Ordinary taught learning models.

Problem solving ability of students. Problem solving is a human activity that combines the concepts and rules which have been obtained before, and not as a generic skill that includes aspects of understanding the problem, problem-solving plan, perform calculations, and check back. Process undertaken students solve math problems are as follows: (1) understand the given problem; (2) use strategies to solve the problem; (3) calculate / solve problems; (4)

double-check the results obtained. By using this process, guiding students' independence in solving mathematical problems. During the process of Teaching and Learning Activities (KBM) takes students always a group to solve the problem.

CONCLUSION AND RECOMMENDATION

Based on the analysis of data and research findings for realistic mathematical approach with emphasis on problem-solving ability is Improved mathematical problem solving ability of students who were taught with realistic mathematical approach is better than the usual learning.

Research on the analysis of differences in mathematical problem solving ability of students is an effort of teachers in improving student achievement. Based on these results, learning mathematics with good realistic mathematical approach applied to mathematics learning activities. To the researchers suggest the following:

For Teachers of Mathematics. From the research, the researchers did the math realistic approach to the study of mathematics that emphasize students' mathematical problem solving ability is very good so it can be used as an alternative for implementing innovative math learning, especially in the teaching material flat wake. However, it should be considered in the allocation of time for other materials. Learning tools such as lesson plans, LAS, teacher and student handbook produced can be used as a comparison for teachers in developing the mathematics learning with realistic mathematical approach to the subject of another.

From the research conducted on realistic mathematics teachers approach seeks to creating a comfortable and pleasant atmosphere for students to pay attention to the condition of the school environment, thus math teacher is expected to create a fun learning environment, provide opportunities for students to express their ideas in their own language and way , dare to argue that students will be more confident and creative in solving his problems.

The learning approach used in this study are realistic mathematical approach, and many more approaches as well as other learning theories commonly applied next teacher, therefore teachers need to add knowledge about theories of learning and innovative learning approaches and appropriate with the material that will be presented in order to carry it out in the usual mathematical learning so that learning can consciously abandoned in an effort to improve learning outcomes of students

Related Institutions. Need for socialization in introducing realistic mathematical approach to teachers and students so that the capabilities of the students, especially the ability of solving mathematical problems can be increased. The results of realistic mathematical approach can improve the students' mathematical problem solving ability, especially on the subject of waking up flat so that it can be used as input for the school to be developed as an effective learning

strategy for other subjects with the allocation of time, the material presented, class and school conditions.

To The Advanced Research. Results of the study revealed the existence of differences in mathematical problem solving ability of students, where students who obtain realistic mathematical approach is better than students who received the usual learning, can do further research with mathematical approach realistic in view of the analysis of differences in mathematical problem solving ability of students to obtain the results of innovative research. Make tools for learning effectively, match it with ability indicator and time allocation that must be achieved.

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