

Increased Ability Of Emotional Protection And Emotional Intelligence Of Mts Negeri 2 Medan Through Mathematical Approach Realistic

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Abstract: This study aims to determine an increase in problem solving skills and emotional intelligence are good for flat wake topics; to describe effectiveness of realistic mathematic teaching for flat structure topic in grade; and to compare the learning achievement of student who take realistic mathematic teaching and the student who take traditional teaching method for flat structure topic in grade VII of MTsN 2 Medan. The population in this research are students of MTsN 2 Medan (Grade VII-1 and VII-5) taken by random sampling. The applied instrument afe consisting of competency test in problem solving, emotional intelligence questionnaire, student activity, student answering process. The data analysis was conducted by t-test and two ways ANAVA. The results of this research are : (1) the increasing of competency in mathematic problem solving with a better realistic mathematic approach than student with traditional teaching, (2) the increasing of emotional intelligence of student with realistic mathematic approach is better than student with traditional teaching, (3) there is interaction between teaching approach with the competency level of student to the increasing of competency in mathematic problem solving, and (4) there is interaction between teaching approach and the competency level of student to the increasing of emotional intelligence, (5) student activity in realistic mathematic teaching that fulfill the ideal time tolerance limit, and (6) the answer of student is various and better either in realistic mathematic teaching set than by traditional teaching. Based on this result, the researcher suggest the realistic mathematic teaching on mathematic teaching can be an alternative for mathematics teacher to increase the creative thinking competency and mathematic problem solving of student as one of alternative to applies innovative mathematic teaching.

Index Terms: Realistic Mathematic Teaching, Emotional Intelligence, Student Activities, Student answering process.

1 INTRODUCTION

In the contents standard for elementary and secondary education units of mathematics (Ministry of National Education Regulation No. 22 of 2006 on Content Standards) it has been mentioned that mathematics courses need to be given to all learners ranging from elementary school to equip learners with logical thinking , analytical, systematic, critical, and creative, as well as the ability to cooperate. Such competencies are necessary so that learners can have the ability to acquire, manage, and utilize information to survive in an ever-changing, uncertain, and competitive state [1]. Mathematics is the fruit of human thought that the truth is general (deductive). The truth does not depend on a scientific method that contains an inductive process. Mathematical truth is essentially coherent. As is known in the world of science, there are three kinds of truths: (1) the truth of coherence or consistency, that is truth based on previously accepted truths, (2) correlational truths, ie truths based on "compatibility" with reality or reality, and (3) the pragmatic truth, that is truth based on its usefulness or usefulness [2]. On the other hand, mathematics as a science actually has such diverse interpretations. Since mathematics taught in schools is also part of mathematics, the various characteristics and interpretations of mathematics from different points of view also play a role in the learning of mathematics in schools. Muhammad Arif Hidayat Lecturer of STAI Jam'iyah Mahmudiyah and Medan State University Email: rudi.habibie93@gmail.com. By understanding the character of mathematics, teachers are expected to take the right attitude in learning mathematics. Furthermore, teachers should understand the boundaries of the nature of mathematics learned to students. Do not let the teacher perceive mathematics as a mere form of formula, nor just as a process of thinking. A comprehensive understanding of mathematics will enable teachers to better manage their learning. Mathematics learning in school is a process or activity of teacher of mathematics subject in teaching mathematics to students which contained teacher's effort to create climate and service to ability, potential, interest, talent

and student's need about mathematics which is very diverse in order to have optimal interaction between teachers with students as well as between students and students in learning the mathematics. According to [3] stated states that a person is said to learn mathematics, if on the person happens an activity that can lead to changes in behavior associated with mathematics. The change occurs from not knowing a concept of knowing the concept, and being able to use it in learning advanced material or in everyday life. Learning mathematics basically not only on the level of recognition and understanding, but also the application aspect or the ability to apply or apply the concept or material that is or has been studied to solve every problem found both in mathematics itself, other science and issues in daily life -day. So that those who study mathematics with the existence of applicative ability will cultivate an appreciation of the benefits of mathematics in life. Then [4] said found that the average level of mathematical mastery of students in math subjects tended to be low. In detail it was found that one of the tendencies that caused a number of students failed to master well the subjects in mathematics that students lack understanding and use good reason in solving problems or problems given. Many factors caused the problem solving ability of mathematics students, one of the factors according to [5] is the factors related to learning in schools, such as teaching methods of mathematics are still concentrated on the teacher, while students tend to be passive. Furthermore, [4] in his research also stated that in terms of mathematics learning process, teachers almost always use lectures and expository methods, thus less train understanding and even problem solving ability of mathematics. According to [1], that in fact all mathematical skills are based on mathematical understanding. Students with understanding skills can help them develop how to think and how to make decisions [6,7,8]. Thus, building a mathematical understanding can develop other mathematical abilities including problem-solving abilities. One example shows the low ability of problem solving mathematics students MTs Negeri 2 Medan with giving preliminary test of problem solving

ability to grade VII students 1MTs Negeri 2 Medan on 10 januari 2013, obtained 27 students from 32 students unable to solve the problem means that 84.3% of students did not reach KKM, one of the sample answer sheet showed the following results :

Figure 1.

On 22 January 2013 researchers also tested problem-solving skills, one of the tested problems is as follows: The length of the side of a side is a right angle of 4 cm. If the difference in the length of the sides is equal to 4 cm, determine the area of the right triangle. From the results obtained 25 students from 32 students cannot solve the problem correctly means that 78.1% of students did not reach the KKM, February 16, 2013, researchers also tested the ability to solve the problem one of the tested questions are as follows: Amir went from the city A to town B while Joko from city B to town A. They leave at the same time at 10.00 am. Amir departs from the city at an average speed of 60 km/h. While Joko depart from city B with an average speed of 75 km/h. If the distance between city A to town B is 360 km. Determine what time the two men met! From these results, 24 students did not achieve the minimum completeness criteria (KKM) of 32 students, this means that 75% of students are under the determined KKM. From the results of two tests giving the ability to solve the above mathematical problems proved that the students of class VII A had difficulty in solving the problem mentioned above. From the results of interviews and observations of some mathematics teachers in MTs Negeri 2 Medan are obtained information that became the root of the problem in learning mathematics are: 1) Mathematical material is abstract.2) Low learning motivation.3) Interaction between students in learning mathematics is not optimal. The ability to solve mathematical problems is so important that it becomes the general goal of teaching mathematics even as the heart of mathematics, preferring the process rather than results [9], and as the focus of school mathematics and aims to assist in developing mathematical thinking [10]. The process of thinking in problem solving requires certain intellectual abilities that will organize strategy. It will train people to think critically, logically and creatively that is indispensable in dealing with the development of society [11]. Initial abilities of mathematics can affect students' ability to solve math problems. Students with high initial math skills tend to have high problem-solving skills as well. It can also be assumed that students with low initial skills taught by using a realistic mathematical approach will have higher problem-solving skills than students with low initial skills taught by using ordinary learning. The use of a realistic mathematical approach will also have an effect on student problem-solving skills when compared to ordinary learning. Moreover, to compare the problem-solving skills of students who have high initial skills taught by using ordinary learning with students who have low initial skills taught by using a realistic mathematical approach. This is because it is not known which is more influential on student problem solving abilities, whether the initial ability of students or learning models used. It is thus assumed that, there is an interaction between students' initial abilities (high, medium, low) with realistic mathematical approaches and ordinary learning to student problem solving abilities. The low math problem solving abilities of MTs Negeri 2 Medan cannot be left alone so demanding a solution. Mathematics learning at MTs Negeri 2 Medan should change itself that emphasizes the process

skills. Thus, math learning should choose a good learning approach and not oriented to conventional approaches alone. Learning approach is expected to shift the use of conventional learning approach and enable and creativity of students in a learning process, especially in learning mathematics such as through the approach of Realistic Mathematics Education (PMR). As a constructivist model of learning, a realistic mathematical approach is expected to improve students' emotional intelligence rather than ordinary learning. However, in developing the emotional intelligence of students using realistic mathematical approach is inseparable from the diversity of students' early math ability conditions. The cooperation of these two variables affects the emotional intelligence of students with different effects of each variable. So it cannot be ascertained that students who have a low initial ability taught by using a realistic mathematical approach will have lower emotional intelligence than students who have high initial ability taught premises his / her intellectual ability is relatively low, can achieve relatively high learning achievement. That is why the level of intelligence is not the only factor that determines one's success, because there are other factors that affect. According to [12], intellectual intelligence (IQ) accounts for only 20% for success, while 80% is a contributory factor of other forces, such as emotional intelligence or Emotional Quotient (EQ). In the student learning process, both intelligences are indispensable. IQ cannot function well without the participation of emotional appreciation of subjects delivered at school. But usually the two intelligences are complementary. Mathematics is called the science queen. So mathematics is the main key of other knowledge learned in school. So often we hear that math is difficult, but the difficulty can be overcome if supported by the number of practice at home, maybe not just the math that needs to practice at home in other lessons are the same. The purpose of mathematics education at the level of primary and secondary education is to emphasize on the arrangement of reason and the formation of personality (attitude) students in order to apply or use mathematics in life [2]. Thus mathematics becomes a very important subject in education and mandatory studied at every level of education. Every individual has a different view of mathematics lessons. Some see mathematics as a fun subject and some view math as a difficult lesson. For those who consider the math fun then will grow the motivation in the individual to learn mathematics and optimism in solving problems that are challenging in mathematics lessons. Based on the observation (November 2011 s.d December 2011) in MTs Negeri 2 Medan, in the process of teaching and learning in schools are often found students who can not achieve learning achievement equivalent to the ability of intelligence. There are students who have high intelligence skills but gain relatively low learning achievement, but there are students who, although their intelligence ability is relatively low, can achieve relatively high learning achievement. That is why the level of intelligence is not the only factor that determines one's success, because there are other factors that affect. According to [12], intellectual intelligence (IQ) contributes only 20% to success, while 80% is a contribution factor of other forces, such as emotional intelligence or Emotional Quotient (EQ) that is self-motivating, overcoming frustration, control the urge of heart, set the mood (mood), empathy and the ability to work together. According to [13] also added that, emotional intelligence is the ability of a person to manage his emotional

life with intelligence (to manage our emotional life with intelligence); maintaining the emotional appropriateness of emotion and its expression through self-awareness, self-control, self-motivation, empathy and social skills. Through a realistic mathematical approach, the researcher hopes to make changes for the students of MTs Negeri 2 Medan, especially class VII so that the problem solving ability and emotional intelligence of students in learning mathematics can be more improved. Based on the background that the author is interested to conduct research with the title of Increased Problem Solving Ability And Emotional Intelligence Students of MTs Negeri 2 Medan Through Realistic Mathematics Approach.

RESEARCH METHODS

This research is categorized into quasi experimental research. The design used in this study includes three stages, namely: (1) Stage preparation of learning devices and research instruments, (2) Stage of experimental learning devices and research instruments, (3) Implementation phase of the experiment. Each stage is designed in such a way as to obtain valid data in accordance with the characteristics of variable in accordance with the objectives of the study. The population of this study were all students of MTs Negeri 2 Medan. The election of class VII as the study population is caused by the cognitive development stage of grade VII students has reached the concrete operational stage in accordance with PMR approach. And also class VII taken as a research population because also the stage of development of emotional intelligence has reached the stage of emotional psychological development. The sample of research was chosen by two classes at random (cluster random sampling). The random selection stage is possible because it is based on information from the principal and the teacher distributing the students on each class evenly in a heterogeneous way. This corresponds to the author, this is in accordance with the opinion of [9], one way of selecting the sample representing its population is a simple random way, that is when every member of the population has equal opportunity to choose. So the selection of samples in this study is by numbering each class on the paper and then done the lottery. The samples of two classes VII (1) and VII (5) were then selected to select the PMR approach group of class VII (1), selected by the usual learning class VII (5). Students in a class (experiment and control) are formed into three groups of students based on grouping of 3 capabilities: high, moderate and low-ability students.

RESEARCH RESULT

The first statistical hypothesis testing was conducted to test whether there were differences in the overall ability of the Problem solving aspects of the students of the PMR data group and the Ordinary Learning. The result shows that the t count is 3.57, while the table value with degrees of freedom, $df (n-2) = 80-2 = 78$, and the one-party test (0.05) is 2.38. It turns out $t \text{ count} > t \text{ table}$, then H_a accepted, so it can be concluded that there is a difference in the ability of the overall problem solving aspects of students group PMR data and Ordinary Learning. In other words, that based on the test results of the difference of two averages, the posttest ability score Problem Solving group of PMR data is better than the Ordinary Learning. The second statistical hypothesis test was conducted to test whether there is an interaction between the

learning with the students 'early math ability on students' mathematical problem solving abilities. The results obtained show that for the learning factor the value of F arithmetic amounted to 3.879 and the significance value of 0.001. Because the significance value is smaller than the significance level of 0.05, then reject H_0 and accept H_a , which means there is interaction between the learning with the students 'early math ability to improve students' math problem solving skills. It can be said that the difference between students' mathematical problem solving abilities in PMR learning with Ordinary Learning differs significantly. This is also evident in the following figure 1. The third statistical hypothesis test was conducted to test whether the improvement of students' emotional intelligence taught by approach of realistic mathematics approach is better than Ordinary learning. The obtained results show that the t count is 2.70, whereas the t table value with degrees of freedom, $df (n-2) = 80-2 = 78$, and the one-party test (0.05) is 2.38. Apparently $t \text{ count} > t \text{ table}$, then H_0 rejected, so it can be concluded that there are differences in overall ability aspects of emotional intelligence of students group data PMR and Ordinary Learning. In other words, that based on the test results of the difference of two average, the emotional intelligence aspect of the PMR data group is different from the Ordinary Learning. The fourth statistical hypothesis test was conducted to test that for learning factor F value counted 54,481 and significance value equal to 0.000. Because the significance value is smaller than the significance level of 0.05, then reject H_0 and accept H_a , which means there is interaction between learning with the level of students 'early ability to increase students' emotional intelligence. This is also evident in the following figure:

DISCUSSION

Discussion of the results of the following research is based on the results obtained in hypothesis testing and data analysis of problem solving abilities and emotional intelligence, and the process of solving student problems on the problem-solving test. The factors involved in this research are as follows by [8,13, 14, 15] such as:

1. Learning Factor

From the results of research that has been described previously shows that with realistic learning is significantly better in improving the problem solving skills of mathematics students compared with Ordinary Learning, as well as the process of solving problems students are taught with realistic learning model is better than the process of solving problems of students taught by Ordinary Learning model.

2. Student Problem Solving Ability

Problem solving is a human activity that combines the concepts and rules that have been obtained before, and not as a generic skill that includes aspects of understanding the problem, planning problem solving, calculating, and re-examining. The process by which students solve math problems is as follows: (1) understanding the given problem; (2) using strategies to solve problems; (3) calculate / solve problems; (4) recheck the results obtained. Using the process, guiding students' independence in solving mathematical problems. During the process of Teaching and Learning Activities (KBM) takes place students are always grouped in solving problems. While at the time of evaluation the students were tested / tested per individual.

3. Student Emotional Intelligence

In this study, emotional intelligence is the ability of students to recognize the emotions themselves, manage the emotions themselves, motivate yourself, recognize the emotions of others (empathy) and the ability to build relationships (cooperation) with others useful to measure the extent of emotional intelligence students related to activity activity of student learning. With indicators as follows:

No.	Aspect	Number of item		Total
		Aspect Positive	Aspect Negative	
1	Recognize emotion	1, 11, 21, 31, 41	6, 16, 26, 36, 46	10
2	Manage emotion	2, 12, 22, 32, 42	7, 17, 27, 37, 47	10
3	Motivate yourself	3, 13, 23, 33, 43	8, 18, 28, 38, 48	10
4	Recognize the emotion of others	4, 14, 24, 34, 44	9, 19, 29, 39, 49	10
5	Build up relationships with others	5, 15, 25, 35, 45	10, 20, 30, 40, 50	10
Total		25	25	50

CONCLUSION

Based on the results of data analysis and research findings during the approach of realistic mathematics with emphasis on problem solving skills and emotional intelligence of mathematics, the researchers obtained the following conclusions:

1. Improving students' mathematical problem solving skills taught by realistic mathematics approaches better than ordinary learning.
2. Improving the emotional intelligence of students taught with a realistic mathematics approach is better than ordinary learning.
3. There is an interaction between learning with students' early math skills on students' mathematical problem solving abilities.
4. There is an interaction between learning with early math ability to increase students' emotional intelligence.
5. Student learning process during realistic mathematics as a whole is better than students who get regular learning. Students who follow the learning of mathematics through a realistic mathematical approach is better than students who use ordinary learning. Where this approach can lead to students' desire to learn together, the students' desire to make their own summaries, create a sense of discipline in learning, courage to ask, honest in the exam.
6. Form of answers made by students in solving problems in each learning in terms of problem-solving steps, indicators of problems and learning approaches used is better by using realistic mathematics than ordinary learning that can be seen from the completion of student answers.

SUGGESTION

Research on the analysis of differences in problem solving skills of mathematics and emotional intelligence of students' mathematics is an effort of teachers in improving student achievement. Based on the results of this study, mathematics learning with realistic mathematical approach is well applied to the learning activities of mathematics. For that researchers suggest some of the following:

1. For Math Teachers

- From the results of research that researchers do a realistic mathematical approach to learning mathematics that emphasizes the problem-solving skills and emotional intelligence of students so good mathematics can be used as an alternative to apply innovative mathematical learning, especially in teaching the material wake flat. However, consideration should be given to the allocation of time for other materials.
- Learning tools in the form of RPP, LAS, teacher handbooks and students generated can be used as comparisons for teachers in developing learning tools mathematics with realistic mathematical approach on other subjects.
- From research conducted on realistic mathematics approach the teacher seeks to create a comfortable and pleasant atmosphere for students by taking into account the condition of the school environment, thus the mathematics teacher is expected to create a fun learning atmosphere, giving students the opportunity to express their ideas in their own language and way, dare to argue so that students will be more confident and creative in solving problems faced.
- The learning approach used in this research is realistic mathematical approach, and many other approaches and other learning theories are usually applied by the next teacher, therefore the teacher need to add insight about learning theories and innovative learning approach and in accordance with material to be submitted in order to implement it in the learning of mathematics so that regular learning can be consciously abandoned as an effort to improve student learning outcomes

2. To the Related Institution

- Need for socialization in introducing realistic mathematical approach to teachers and students so that the ability of students, especially problem solving ability and emotional intelligence of mathematics can increase.
- The results of realistic mathematical approaches can improve students' ability, especially problem solving skills and mathematical emotional intelligence on the subject of wake up so that it can be used as input for the school to be developed as an effective learning strategy for other subjects with attention to time allocation, material disampaika, condition classes and schools.

3. To Advanced Researchers

- The result of the research revealed the difference of problem solving ability and emotional intelligence of students mathematics, where the students who get the realistic mathematics approach better than the students who get regular learning, can do further research with realistic mathematical approach in looking at the analysis of different problem solving abilities and emotional intelligence mathematics students to obtain innovative research results. Design the learning tools effectively, adjust capability indicators and time allocations to be achieved.

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