

Mathematical Representation Ability And Self Confidence Students Through Realistic Mathematics Approach

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ABSTRACT

Math can meet potential supply of qualified human resources that human beings have the ability to reason logically, critically, systematic, rational, and meticulous; have the ability to be honest, objective, creative, and open; has the ability to act effectively and efficiently, and have the ability to work together. One of the goals of learning mathematics is a mathematical representation can improve the ability and self-confidence of students. Realistic Mathematics is an alternative approach to learning that can support both these capabilities. This study aims to determine whether there are differences in the ability of mathematical representation and self-confidence of students who have a realistic approach to mathematics is taught through conventional approaches.

This research is a quasi experimental research with the entire population of the seventh grade students of MTs Muhammadiyah East Curup totaling 2 class, so that sampling using sample saturated / whole of the population are students of class VII as an experimental class B and class VII A as a control class.

Based on the results of t-test statistical analysis, the data posttest ability to obtain a mathematical representation that the conclusion "there are differences in the ability of the mathematical representation of students who are taught by PMR learning approach and the conventional learning approach". While based on the results of t-test statistical analysis of data obtained conclusions Self Confidence "there is no difference in self-confidence of students who are taught by PMR learning approach and the conventional learning approaches."

Keyword : mathematical representation ability, self confidence, realistic mathematics approach

INTRODUCTION

mathematics learning objectives have changed, no longer only emphasize on improving learning outcomes, but also expected to improve the ability to: (1) communication of mathematics (mathematical communication); (2) mathematical reasoning ; (3) solving a mathematical problem (mathematical problem solving); (4) associate the ideas of mathematics (mathematical connections); (5) the representation of mathematics (mathematical representation). (NCTM, 2000: 7). Inclusion of representation as one of the standard components in the process of Principles and Standards for School Mathematics is quite reasonable due to the mathematical thinking and communicating mathematical ideas, people needs to represent it in a variety of ways. Moreover, there are no doubt that all the objects in abstract mathematics and to learn and understand abstract ideas that need representation. (Fadillah, 2008).

To help students understand math well, the teacher should lead students to build a real concept in the minds of students or associate mathematics with the real world. As one of the alternatives that can lead students learning using real-world concepts are learning approach Realistic Mathematics Education (RME). RME is one of the alternative learning approaches that engage students in a realistic context or problem to create significance in the study of mathematics so that all the goals and benefits of studying mathematics can be realized and utilized appropriately.

In the RME, representation is needed because when students make representations, then the student has attempted to express the ideas of abstract mathematics that students are then displayed as a model of a real or surrogate form of a problem situation that is used to find the solution of the problem under faced as a result of the interpretation of the mind. So that students can solve problems and understand the importance of studying mathematics.

Furthermore, in this PMR learning approaches, in addition to the mathematical representation of cognitive abilities, there are also trying to grow student affective abilities. One of the students is the ability of affective self-confidence or self-esteem the students' confidence in the assessment of the ability of students and the extent to which students can feel the "decency" to succeed. Why the confidence needed? Because in this PMR learning approach students are asked to try to resolve the problem of contextual ways according to the mind, knowledge, and their experience and asked to present the results of their teamwork to the class. If students are not confident, then the student will be difficult in issuing his opinion that could adversely affect the meaningfulness of students in learning mathematics. Conversely, if students have high self confidence, then these students will be easier to express opinions and present the results of cooperation group in front of the class without feeling insecure or afraid of.

In addition, the display or express mathematical ideas (representations) or when students are asked by the teacher to work on the problems of representation or finding contextual issues in their own way who need representation, then if the student has a good self confidence, students will feel confident, feel confident, and more able in working on without fear of wrong or inferior to the capabilities it has.

MATHEMATICAL REPRESENTATION ABILITY

Representations are expressions of the mathematical ideas that displayed the students as a model or a substitute form of a problem situation that is used to find the solution of the problems which are being faced as a result of the interpretation of the mind. (Fadillah, 2008). Mathematics is abstract, it is to simplify and clarify the mathematical problem solving, representation plays an important role, namely to transform abstract ideas into tangible concepts, eg with pictures, symbols, words, graphics and others. In addition, mathematics provides a broad overview of the concepts in terms of the analogy existing topics. It is expected that when students have access to the representations and the ideas that they show them, then they have a set of tools that significantly expand their capacity to be ready to think mathematically (NCTM, 2000: 67).

According to the NCTM, the importance of student representation is that it can be used to communicate mathematical ideas, arguments, and mathematical understanding of the other students. Representation capability is one component of a standard process in Principles and Standards for School Mathematics in addition to the ability of problem solving, reasoning, communication and connections. It contains a number of reasons. According to Jones (in Fadillah, 2008), there are three reasons why the representation is one of the standard process, namely: 1) fluency in doing the translation between different representations of different types are the basic abilities of the students need to develop a concept and mathematical thinking ; 2) mathematical ideas presented through various representations teacher will provide an enormous influence on students in learning mathematics; and 3) students need practice in building its own representation

so that students have the ability and a good understanding and flexible concept that can be used in problem solving.

Representations students can also allow students to determine the relationship between various concepts and apply them in solving realistic problems. (Mandasari 2011: 22) There are four ideas that are used in understanding the concept of representation, including:

1. Representation can be seen as an internal abstraction of mathematical ideas or cognitive schemes constructed by students through experience;
2. As a mental reproduction of previous mental state;
3. As the grain structure through image, symbol, or emblem;
4. As the knowledge of something that represents something else.

Some forms of representations such as charts, graphs, and symbolic expressions, have long been an integral part in the teaching of mathematics in schools. But this form of representation cannot be used effectively because it is not taught directly in learning. Thus requiring learning can foster students' ability representation.

From the above it can be concluded that the representation is a depiction capabilities, translation, disclosure, reappointment, figuratively or even modeling ideas, ideas, mathematical concepts, and the relationship between them that contains a configuration, construction, or certain situations that students appear in various forms an attempt to achieve clarity of meaning, demonstrate understanding or finding a solution to his problems.

The benefits or added value acquired as a teacher or student learning outcomes involving representation is as follows:

1. Learning that emphasizes the representation will provide a rich context for new learning.
2. Improving students' understanding.
3. Making a representation as a conceptual tool
4. Increasing the representation of students' ability to solve problems

Indicators according to the mathematical representation of the NCTM (2000), establishes that the learning program from pre-kindergarten through grade 12 should enable students to:

1. Create and use representations to organize, record, and communicate mathematical ideas;
2. Select, apply, and translate mathematical representations to solve problems;
3. Using representations to model and interpret physical phenomena, social, and mathematical phenomena

SELF CONFIDENCE

The word confidence comes from "Latin confident", which means trust. Believe and trust in yourself, have confidence in our ability in any situation we need to do. Confidence is how far you have confidence in your assessment on your ability and the extent to which you can feel the "decency" to succeed. Self confidence or confidence can be regarded simply as a person's beliefs on all aspects of surplus assets and the confidence that made him feel able to achieve a variety of goals in his life (Hakim, 2002: 6).

According Lautser (in Megawati, 2009) self-confidence is an attitude or feeling confident about his own abilities so that the person concerned is not too anxious in its

actions, can feel free to do the things he likes and take responsibility for his actions and polite in interacting with others, can accept and respect others, have the drive to excel and be able to recognize the advantages and disadvantages.

According Ismawati and Sjahudi Sirodj (2010), self-confidence is one's belief to be able to behave as expected and desired and one's belief that he can master a situation and produce something positive. From the description, it can be concluded that self confidence is feeling confident in the ability of self that includes both assessment and acceptance of him as a whole, acting in accordance with what is expected by others so that the individual can be accepted by others and the environment. This acceptance includes acceptance of physically and psychologically.

According Ismawati and Sjahudi Sirodj (2010), Self confidence consists of four indicators, namely:

1. Belief in the ability of self.
2. Be yourself.
3. Ready to face the rejection of others.
4. good self control.

Some of the traits or characteristics of individuals who have self-confidence that is proportional, among others:

1. Believe in the competence / capability of self, to not need praise, recognition, acceptance, or respect others.
2. Do not compelled to show conformist attitude in order accepted by another person or group.
3. Dare to accept and face the rejection of others-dare to be yourself.
4. Have good self-control (not moody and emotionally stable).
5. Have an internal locus of control (see the success or failure, depending on the business yourself and do not easily give in to fate or circumstance and are not dependent / expect help from others).
6. Having a positive outlook about themselves, other people and situations outside of himself.
7. Having realistic expectations of yourself, so that when expectations are not realized, he was still able to see the positive side of himself and the situation.

According Ignoffo (in Megawati, 2010), there are some characteristics that describe an individual who has self-confidence, among others:

1. Having a positive outlook towards self
2. Confident of his ability
3. Do something according to what people think
4. Think positive in life
5. act independently in making decisions
6. It has the potential and ability

The characteristics of individuals who lack confidence are as follows:

1. Trying to show conformist attitude, solely for the sake of gaining recognition and acceptance of the group.
2. Keep fear / concern about rejection.

3. It is difficult to accept the reality of self (especially receiving shortcomings) and look down on the ability of self-but on the other hand, put unrealistic expectations on yourself.
4. Pessimistic, easy to judge things from the negative side.
5. Fear of failure, thus avoiding any risk and do not dare to set a target to succeed.
6. Tends to reject compliments are sincere.
7. Always to place / position itself as the latter, because he was not able to judge.
8. Having an external locus of control (easy to give in to fate, so depending on the circumstances and the recognition / acceptance and help from others.

It can be concluded that people who are confident or self-confidence has a calm attitude and a positive attitude in dealing with various problems and do not give up easily, have good social skills, believe in their own ability, the courage to express opinion, unselfish perform the task well and responsible and have a plan on its future. With these skills the individual has the possibility to be more successful in life when compared to people who have little or no confidence or low self confidence. There are three factors that affect the incidence of self-confidence, among others:

1. The process of learning, to foster self-confidence felt from an early age. Given parenting parents have a great role in improving self-confidence of the child. Parenting provided include affection, attention, acceptance, and most important is the emotional attachment with parents sincerely. With the warmth and care of the elderly, child's confidence will begin to sprout. When children feel valuable and worth in the eyes of her parents, the child will tend to even become more confident.
2. The concept of self, to become a person who has self-confidence, an individual requires a positive self-concept. The concept of self is an idea held by a person concerning himself. If an individual is already familiar with the situation himself and be able to accept the advantages and disadvantages that the individual will have good confidence
3. Interactions with the environment, a person will learn about themselves through direct interaction with others. By interacting, an individual will get information about him from others. But if there is no other person who assesses the individuals do not know themselves more deeply

METHODOLOGY

This study used a quasi-experimental methods (quasi-experimental). Quasi-experimental research objective is to obtain information that is estimated to information that can be obtained by actual experiment in a state that does not allow to control and manipulate all of the variables except for a few variables only. In this method the group is not subject randomization (based on an existing class).

The population in this study were all students of class VII MTs Muhammadiyah East Curup 2011/2012 school year consisting of two classes with a total enrollment of 50 people. Sampling was performed by the saturated sample technique for students of class VII only 2 classes. Where the sample is saturated sampling of the entire population. To establish the experimental class and the control class, conducted by lottery. Sweepstakes that out first designated as the experimental class and the draw came out the second set as the control class. The population in this study homogeneous as seen by National Final Examination graduate students during elementary school or at the time of entering

MTs Muhammadiyah Curup East and also from the values of the daily tests of students in the first semester prior to the study.

RESULT AND DISCUSSION

At the end of the tests conducted to determine the ability of analysis of the mathematical representation of students after learning given. The data used is the data post-test aspects of the mathematical representation ability of students to identify basic competencies properties, area and perimeter of a rhombus. The results of calculations performed can be seen in the following table:

No	Analisis Data	Hasil	Keterangan
1.	Uji Normalitas	Kelas eksperimen: χ^2 hitung = 5,4565 $\chi^2_{(0,05,4)} = 9,488$ χ^2 hitung = 5,4565 < $\chi^2_{(0,05,4)} = 9,488$	H ₀ diterima, artinya “sebaran data mengikuti distribusi normal”.
		Kelas Kontrol : χ^2 hitung = 3,2797 $\chi^2_{(0,05,4)} = 9,488$ χ^2 hitung = 3,2797 < $\chi^2_{(0,05,4)} = 9,488$	H ₀ diterima, artinya “sebaran data mengikuti distribusi normal”.
2	Uji Homogenitas	$F_{1-\alpha/2(24,24)} = 0,4407$ $F_{\alpha/2(24,24)} = 2,2693$ F hitung = 1,0454 $1,0454 < 2,2693$ atau $1,0454 > 0,4407$	H ₀ diterima. Artinya “varians kelas eksperimen dan kelas kontrol sama”.
3	Uji - t	$t_{(0,025,48)} = 2,3139$ t hitung = 3,532 t hitung > $-t_{(0,025,48)}$ atau t hitung > $t_{(0,025,48)}$ $3,532 > -2,3139$ atau $3,957 > 2,3139$	H ₀ ditolak. Artinya “ada perbedaan kemampuan representasi matematis sesudah diberi pembelajaran antara kelas eksperimen dan kelas kontrol”.

In Self Confidence analysis questionnaire to determine students' self confidence after learning given. The calculation results can be seen in the following table:

No	Analisis Data	Hasil	Keterangan
1.	Uji Normalitas	Kelas eksperimen: χ^2 hitung = 4,3524 $\chi^2_{(0,05,4)} = 9,488$ χ^2 hitung = 4,3524 < $\chi^2_{(0,05,4)} = 9,488$	H ₀ diterima, artinya “sebaran data mengikuti distribusi normal”.

	Kelas Kontrol :	χ^2 hitung = 0,8443 $\chi^2_{(0,05,4)} = 9,488$ χ^2 hitung = 0,8433 < $\chi^2_{(0,05,4)} = 9,488$	H_0 diterima, artinya “sebaran data mengikuti distribusi normal”.
2	Uji Homogenitas	$F_{1-\alpha/2(24,24)} = 0,4407$ $F_{\alpha/2(24,24)} = 2,2693$ F hitung = 1,0526 $1,0526 < 2,2693$ atau $1,0526 > 0,4407$	H_0 diterima. Artinya “varians kelas eksperimen dan kelas kontrol sama”.
3	Uji - t	$t_{(0,025,48)} = 2,3139$ t hitung = 1,023 $-t_{(0,025,48)} < t$ hitung < $t_{(0,025,48)}$ $-2,3139 < 1,023 < 2,3139$	H_0 diterima. Artinya “tidak ada perbedaan <i>self confidence</i> siswa antara kelas eksperimen dan kelas kontrol”.

After the treatment given the experimental class and the control class post test results obtained on the hypothesis test (t test) there are differences in average viability mathematical representation with t test conditions before the data were normally distributed and have the same variance.

This difference is due to the given experimental class learning approach Realistic Mathematics Education (PMR) in which this learning has characteristics that are suitable for the mathematical representation capability and also the goal of learning mathematics itself. One of the characteristics of the PMR is the use of the context of the use of realistic problems and the use of mathematical models of concrete form to the level of mathematical knowledge that meets the indicators of formal mathematical representation used for solving mathematical problems. By using PMR, students were led to a more complex understanding of the learning of mathematics because they do not always learn math in the abstract but starting from the mathematical form of concrete that will be trained mathematical representation capability. Moreover, in this first PMR students are asked to construct their own knowledge about the learning of mathematics before guided by the teacher. This is because the PMR learning approach has more advantages compared with conventional learning more teacher-centered, only one-way communication, as well as teaching methods over the mastery of mere concepts without reference to reality as the PMR learning approach. So the ability of the mathematical representation of students in the experimental class that uses PMR learning approach is better than the control class that uses the conventional learning approaches. Researchers have also analyzed the average score of students' mathematical representation capability experimental class and control class, it turns out the average for the indicator first, second, and third for the experimental class better than the average of the control class.

CONCLUSION

Based on the analysis and discussion that has been described in the previous chapter, then from this research can be concluded that:

1. There are differences in the ability of students to use mathematical representations Realistic Mathematics Education learning approach with the

ability of students to use mathematical representations of conventional learning approaches on the subject in class VII Rhombus Curup MTs Muhammadiyah East.

2. There is no difference in the students' self confidence using Realistic Mathematics Education approach to learning with self-confidence of students who used the conventional learning approaches on the subject in class VII Rhombus Curup MTs Muhammadiyah East.

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