THE INFLUENCE OF REALISTIC MATHEMATICS EDUCATION (PMR) FOR MATTER OF INTEREST ON QUADRILATERAL INTEREST AND STUDENT RESULTS IN CLASS VII OF SMP NEGERI 1 NGAGLIK

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Abstract

The type of this research is descriptive research in quantitative and qualitative. Research subjects at this research is all students of class VIID SMP Negeri 1 Ngaglik which amounted to twenty five students. Based on the analysis of the study results, the researches obtained twenty five students were able to identify the nature of the rectangle but has not been able explain exactly one rectangle properties. And then twenty five students have been able to identify the nature of the square but can not explain exactly one square properties and questionaires which researches obtained are twenty five students during the learning process, interest on the teachers, interest in learning, and feeling like learning.

Keywords: PMR, quadrilateral, rectangle

Introduction

The observation of the learning process in the seventh grade f that is the active students during the learning process applied with the students asked the teacher about teaching materials or teaching materials and how to solve the problems contained in these teaching materials. Results of interviews with students that is twenty-five students did not like the learning process and sixteen students liked the learning process in the classroom. The reason given by the students assume they do not like learning is more desire the learning process beyond the classroom related to the school environment. So that the school environment can be used by teachers during the learning process.

Researchers wanted to try a different approach in the learning process of mathematics in the classroom who use the school environment as a context for learning mathematics. The approach

will be used by researchers is realistic mathematics education (PMR) because of the presence of the PMR approach then students are encouraged to think creatively and directly involved to resolve the existing problem-solving daily life (reality). Realistic mathematics education can enable students during the learning process.

The background of the problems stated above, the problem to be studied is what learning outcomes achieved by students on the material after undergoing a rectangular flat field of learning with PMR approach? and what the difficulties experienced by students in the material field of flat rectangles with PMR approach?

Theory

A. Definition

1. Learning Outcomes

According to Sudjana (2010, 22), learning outcomes are the abilities students have after receiving a learning experience. According to Warsito (in Depdiknas, 2006, 125), learning outcomes are characterized by a relatively permanent positive behavioral change in the learners. According to Wahidmurni (2010, 18), a person can be said to have succeeded in learning if he is able to show a change in him. These changes include in terms of ability to think, skill or attitude towards an object.

According to Bloom's taxonomy, it is grouped into three domains (domains) namely the cognitive domain (thinking ability), affective sphere (attitude), and psychomotor realm (skill). In connection with that then by Gagne (in Sudjana, 2010, 23) suggested learning outcomes into five types among other things: (1) the results of intellectual learning is the most important learning outcomes of lingsikolastik system; (2) cognitive strategies that regulate the way of learning and thinking person in the

broadest sense, including the ability to solve problems; (3) attitudes and values, associated with the direction of one's own emotional intensity as inferred from the trend behavior toward people and events; (4) The verbal information, knowledge in the sense of the information and facts; and (5) motor skills are skills that serve for the environment and attain concepts and symbols.

To know one's learning outcomes is done with test and measurement. Tests and measurements require a tool as the data collection instrument learning outcomes assessment. According Wahidmurni (2010, 28), the instrument is divided into two major parts, namely test and non-test. According to Hamalik (2006, 155), the learning results obtained can be measured through the progress that students get after learning the real. Learning outcomes visible changes in behavior on students that can be observed and measured by a change in attitude and skills. The change can be interpreted as a better development and improvement than ever before.

According to Bloom's theory there are three areas in which learning outcomes: cognitive (thinking skills), affective (attitude), and domains psychomotor (skills).

2. Approach of Realistic Mathematical Learning (PMR)

   a. Philosophy

      Approach Realistic Mathematics Education (RME) or approach Realistic Mathematics (PMR) was first introduced in the Netherlands in 1970 by Hans Freudenthal. The underlying philosophy of PMR is mathematics and human activity. According to Shadiq and Mustajab (2010, 7), the PMR Approach is an approach that expresses experiences and events close to the student as a means of understanding math problems. This means math must be close to the students and

relevant to their daily lives. Thus abstract mathematical concepts, can be understood in real by the students because the abstract concept can be implemented in their lives.

This is confirmed by the concept of Freudenthal (in Suradi, 2001, 2) which states that mathematics is a human activity. Therefore, students should be given the opportunity to rediscover the ideas (reinvention) and construct mathematical concepts with adult guidance. This work is done through the exploration of a variety of situations and problems realistically. Realistic in this regard is intended not just related to the real world, but emphasizes the real problems that can be imagined by students. So the emphasis is to make something that becomes real in the minds of students.

3. Principle Approach Realistic Mathematics Education (PMR)

As according Treffers (1987) formulated the three principles of realistic mathematics education (in Wijaya, 2012, 24-26), namely:

i. Guided Reinvention / progressive mathematizing, this principle gives students the opportunity to discover their own mathematical concepts by solving various contextual problems that students already know. Graphically progressive is meant to be math in vertical and horizontal. Math horizontally, the student should be able to identify the contextual matter so that it can be transferred into a math problem in the form of models, diagrams, tables to be understood. While the vertical math, students completed the form of formal or non-formal mathematics of the contextual problems using concepts, mathematical operations and procedures that apply.

ii. Didactical phenomenology (learning phenomenon), this principle emphasizes the importance of contextual questions to introduce mathematical topics to students. What should be considered is the suitability of the context application in the learning and matching effects of the rediscovery of the mathematical form and model of the contextual question.

iii. Self – developed models (model – model dibangun sendiri), prinsip ini dengan model – model yang dibangun berfungsi sebagai jembatan antara pengetahuan informal dan matematika formal.

4. Characteristics of Realistic Mathematics Learning Approach (PMR)

As according to Treffers (1987) formulated five characteristics of Realistic Mathematics Education (in Wijaya, 2012, 21-23), namely:

i. Use of Context

Context is not just a real-world problem, but could be in the form of games, the use of props, or other situations as long as they are meaningful and can be imagined in the minds of students

ii. The use of mathematical models for the progressive

The use of the model serves as a bridge from concrete knowledge and mathematics to formal-level mathematical knowledge

iii. Utilization of student construction results

Students have the freedom to develop problem-solving strategies so that a variety of strategies are expected to be obtained.

iv. Interactivity

Utilization of interaction in mathematics learning useful in developing cognitive and affective abilities of students simultaneously.

v. Linkage

Through this connection, a mathematics learning is expected to introduce and build more than one mathematical concept simultaneously.

B. Process Problem Solving

By Polya (1985), problem solving as an attempt to find a way out of the difficulties in order to achieve a goal that is not so easy right away to be reached, while according Utari (in Hamsah 2003, 24), problem solving may be creating new ideas, find techniques or a new product. Even in the learning of mathematics, besides problem solving has a special meaning is different interpretation, for example solving the story problem that is not routine and apply math in everyday life. Polya (1985) proposed a four-step problem-solving phase to understand the problem, plan the problem, solve the problem and look back.

a. Problem Solving Process According to Polya (1985).

The problem-solving steps according to Polya (1985) are as follows

a. Understanding the Problem

To be able to understand a problem that must be done is to understand the language or terms used in the community, to formulate what is known, what is being asked

b. Plan Problems

To plan for problem solving we can look for the possibilities that could happen ever solved a problem that has a similar pattern to the problem to be solved.

c. Implement the Plan

This step is easier than solving plan, which must be done is run a strategy that has been made with diligence and thoroughness to get a settlement.

d. Looking Back

Activities in this step is to analyze and evaluate the strategies and the results obtained correctly, the strategy created can be used to solve similar problems.

Methodology

The type of this research is descriptive research in quantitative and qualitative. Research subjects at this research is all students of class VIID SMP Negeri 1 Ngaglik which amounted to twenty five students. This research was conducted at SMP Negeri 1 Ngaglik. This study was conducted in April for the second semester of the academic 2015/2016. Data Collection Technique are observation, giving questionnaire, written test, student activity sheets, and documentation. Data analysis technique are data analysis implementation of learning process plan (RPP), analysis of interest-learning questionnaires

Results and Discussion

A. Initial Observation Declaration of Research

Before the research activities carried out, the researchers conducted interviews with teachers on mathematics teaching methods in class. Teaching methods that teachers teach using lecture methods and student conditions during the learning process are very active. Based on the results of observation before the researchers do direct research is the ideal learning process because students are active during the learning process and students can dig information they do not understand by the process of signing answer. Once the researchers conducted observations, the researchers will use realistic

mathematics teaching methods in class VIID with the matter "Wake flat rectangular Rectangular and square". The number of students in class VIID twenty five students are still actively participates in education in SMP Negeri 1 Ngaglik.

Researchers conducted a study in class and took this VIID some random sample of ten students that they prefer the realistic mathematics teaching methods because they think mathematics is learned has to do with everyday life. During the learning process, the students are more understanding and able to solve the problems that the teacher gives. But we as students realize that we do not like theory too much

B. Constraints in Research

Investigators before research experience barriers within the limitations of a book entitled realistic mathematics education because of the limitations of books in the library is very little variance that researchers take resources from various journals that have been studied and used by other researchers. Both researchers experienced obstacles about permission to retrieve data in SMP Negeri 1 Ngaglik because they have to take care of a letter of permission through the Education Ministry Sleman. The three researchers experience obstacles when doing the preparation of the material because researchers must really understand the concept of learning materials rectangular field, especially rectangular and square. The four researchers must be patient while doing data retrieval because most of the students who have different character and must explain clearly the concept of rectangular subject matter.

C. Worksheets Two

Indicator one based on the results of student work then obtained learning results:

1. 20 students say length AB = 3 cm, because length AB = length of CD

2. 3 students say length AB = 3 cm, because length AB = length of CD is the same length

3. 2 students say length AB = 3cm

Expected conclusion student is the length of AB = CD = 3 cm long, since ABCD is a square. Consequently it has two pairs of same sides of length. So long AB = CD length = 3 cm

So the conclusion about the number 1 is as many as 25 students have not been right to identify the properties - the nature of the square. One character is if there are two pairs of sides equal in length, the size of the two pairs of sides of the same length

Indicator 2 based on the results of student work then obtained learning results:

1. 20 students say the length of BC = 3 cm, because the length of BC = length of AD

2. 3 students say the length of BC = 3 cm, because length BC = AD length is the same length

3. 2 students say the length of BC = 3cm

Expected conclusion student is the length of BC = AD = 3 cm long, since ABCD is a square. As a result, two pairs of the same length. So long BC = AD = 3 cm long.

So the conclusion of the question number 2 is as many as 25 students have not been exact to identify the properties of the square. One character is if there are two pairs of sides of the same length, the size of the two pairs of sides of the same length

Indicator three based on the results of student work then obtained learning results:

1. 11 students say yes, at point E

2. 9 students say yes, because the AC line and the BD line intersect at point E

3. 3 students say yes, because it intersects at point E

The expected conclusion of the students is the ABCD rectangle with AC and BD are the two intersecting diagonals. As a result AC and BD are located at the E point of the second diagonal intersection. Thus the length of AC and the length of BD are the two diagonals that intersect at the midpoint call the point E

So the conclusion about the number 3 is as many as 23 students are not right to identify the properties - the nature of the square. One of its properties is if there are two diagonals intersecting at the midpoint of the second diagonal then the intersection of the two diagonals located at point E call the middle point

Conclusion

Based on the implementation of research on the application of realistic mathematical approach to the material field of rectangular field to the learning outcomes and interest in students in class VII D SMP Negeri 1 Ngaglik and the discussion obtained, it can be concluded as follows:

- Student learning result obtained from chapter four, the researcher can draw conclusion that twenty five students have been able to identify rectangular properties, but students have not been able to explain exactly one of the known rectangular properties. Twenty five students have been able to identify the properties of the square, but students have not been able to identify any of the known square properties.
- The difficulties students encounter on the rectangular flat matter with the PMR approach are the students confused to answer the exercise question about if the workings in which the sample examples are altered, the students find it difficult to cite the corresponding rectangular and square examples in daily life, students are still confused if to explain the results of his work with his friends.

Suggestions

1. Mathematics teacher at SMP Negeri 1 Ngaglik to be able to consider PMR approach as an alternative influence on students' learning outcomes and interests.
2. To other researchers who choose PMR approach model as an alternative influence to improve learning outcomes and student learning interest to always do research more optimally in learning mathematics either in different schools or different subject so that can see the influence of PMR approach to learning outcomes and interests student learning.

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