THE USE OF REALISTIC MATHEMATIC EDUCATION APPROACH TO IMPROVE LEARNING OUTCOMES ABOUT TWO-DIMENSIONAL SHAPES AT SDN PANDEGLANG 14

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Article Info	Abstract
History: Submitted February 12th, 2020 Revised February 13th, 2020 Accepted February 17th, 2020	The background of this research is the students' difficulties in solving two-dimensional shapes, and the students' learning outcomes are still low. Then in the learning process, requires an approach that can improve students' activity and students learning outcomes, namely the RME approach. In this research, the subject of Mathematics learning activities with the RME approach were the 24 students of 6th-grade. In this study uses the model of Classroom Action Research (CAR). Based on research with a Realistic Mathematics Education (RME) approach on the material of two-dimensional shapes in 6th-grade has a great influence on improving student understanding. The results of the study showed that there were student activities scores using the RME approach starting from cycle I with the score of 1.9, in cycle II with a score of 2.9, and in cycle III with the score 3.9. On pre-cycle student learning scores got 4.2, cycle I 5.5, cycle II 6.8 and cycle III got a score of 8.2. So, it can be concluded that the use of the RME approach in mathematics learning about two-dimensional shapess can improve student activities and student learning outcomes with good improvement. **Keywords**: Realstic Mathematic Education (RME), Learning Outcomes

A. Introduction

Today, what remains a hot topic of discussion in the quality of education is student achievement in a particular field of study. From the several subjects presented at the elementary schools, mathematics is one of the subjects that the system needs to be able to practice reasoning. Through mathematics learning will improve abilities, develop thinking skills and their applications, and mathematics as well as one of the scientific disciplines that are very important in developing thinking patterns. Mathematics develops because of the thought process.

The successes of learning achievement is an indicator and success or failure of an educational process. One of the appropriate efforts to achieve educational goals is through effective and efficient teaching and learning activities, so there are interactions between teachers and students.

Da In improving their thinking skills, humans do a variety of learning in an education system both formally and informally. The study that must be learned in improving these thinking skills, one of them is a mathematics subject.

Mathematics has a very important role in everyday human life, which is in the process of buying and selling, measuring data management and etc. Mathematics learning in elementary schools should be adjusted to the students' thinking development and done in stages, namely from the concrete stage to the abstract stages continuously. Learning at the concrete stage must use props/teaching aids that are certainly associated with everyday life. According to Bruner (Junaedi: 2015) Enactive relates to concrete objects as concept recognition, mathematics iconic is concerned with the presentation of images and symbols that means using words and symbols.

Mathematics Learning in elementary school must also be linked both to the props/teaching aids used and the use of contextual problems with the use of learning models. If these stages are implemented then the story problems will relate to everyday life. In the elementary school learning process can improve the creativity of children's thinking. So mathematics learning in elementary schools is a teaching and learning process that involves teachers

and students where the students' behavior changes are directed to improving the ability in mathematics learning.

A teacher who wants to deliver the mathematical concept or material is not only able to understand the concept, but also must know how to deliver the material, which must be adjusted to the child's ability level and the child's mental development stages. Learning that does not pay attention to the children's mental development stages, are most likely caused children to have difficulties, because what is presented to the child does not match their ability to apply the material provided. Learning theory in teaching mathematics is very important, therefore teaching methods must be adapted to the learning theory (Saleh, 2012).

Student learning outcomes can be seen after the learning evaluation using test instruments and can be linked as the final grade, whether student learning outcomes increase or decrease. Learning should be the changes in individual relative behavior as a result of experience and interactions with the environment that involves cognitive processes. Student learning outcomes

are the students' abilities after they have received a learning experience (Sudjana, 2009).

UnTo improve students' abilities in appropriate mathematics learning is the main target because by understanding the learning, then student learning outcomes will increase. So student learning outcomes in the form of assignments, means that students are able to master the material being taught. Learning outcomes in the form of application and assessment mean that students are able to apply their learning outcomes in daily life, while the learning outcomes in the form of knowledge are students have extensive knowledge, able to think, have a critical attitude and have skills. Therefore, in order to improve students' learning outcomes, a teacher must have the knowledge, methods, strategies, and approaches that must be adjusted to the child's age level and learning must be fun for students because many factors can affect students' learning. In the context of a learning revolution, teachers are required to create a good class atmosphere and a fun learning process for students so the students' effectiveness will be increased. Student

learning outcomes are not only seen from the scores obtained by students but the most important is the meaningful learning of students.

Mathematics is one of the basic sciences that has a significant role both in daily life and in science and technology development. According to Soedjadi (Akib, 2001) Mathematics is often seen as the language of science, a communication tool between science and scientists, and the analytical tool. Thus, mathematics places itself as a strategic tool in developing intellectual abilities and skills.

In mathematics learning, often heard complaints from both teachers and students, such as difficulties in solving problems. In this two-dimensional shapes learning, students are expected to be able to complete and understand it in everyday life.

As a structured science, mathematics has a link between one concept with another concept. The abstract character of mathematics requires students to have sufficient prerequisite knowledge to learn the next material (Putri, 2016).

The teacher must understand the differences in students individually, in order to be able to serve education according to their differences. Students will develop according to their respective abilities (Sidik, 2016).

Based on the observations at SDN Pandeglang 14, Pandeglang Regency, which was used as this research location, apparently based on class observations there are still many students who have difficulties in solving the problem of two-dimensional shapes. As the indicator, it can be seen from the results of the formative test of two-dimensional shapes material, with an average score of grade 6 in the second semester (2016/2017 academic year) of 4.83 and 75% of the total 24 students gets the scored below 6.0. This means that student learning outcomes are still low due to the lack of teacher's ability to prepare subject matter, monotonous learning, teachers using an improper approach, learning is less associated with daily life and lack of students' interest in studying about the material of two-dimensional shapes. Various factors that influence student learning outcomes are external elements (environmental, instrumental) and inner elements (physiological and psychological) (Painun, 1992).

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Learning does not start from formulas, definition or characteristics, then proceed with the discussion of the examples, as has been done in schools.. However, formulas, definitions, and characteristics are expected as if discovered by students themselves through contextual guidance given by the teacher at the beginning of learning (Jarmita & Hazami: 2013).

One effort to improve students learning outcomes is by applying the RME approach. According to Silvia Dani (Dani, et al., 2017) The RME approach encourages students to play an active role in rediscovering mathematical ideas and concepts and exploring the real problems under the teachers' guidance. (Mashudi, 2016) Realistic Mathematics Education (RME) is one approach of mathematics learning oriented towards mathematize everyday experiences and applying them in everyday life.

Learning approach of Realistic Mathematics Education (RME), is an approach that can encourage activeness, arouse students' creativity interest in learning to improve their learning outcomes. The RME approach is one of the approaches in mathematics learning whose philosophical foundation is in line with the philosophy of constructivism which states that knowledge is the construction of a learning person. In this case, learning using the RME approach, students are encouraged to actively work even expected to construct or build their own mathematical concepts, thus RME approach has the potential to improve students learning outcomes on mathematics.

The learning outcomes in this research are to improve the abilities obtained after students attend the learning of two-dimensional shapes with the RME approach. The two-dimensional shape consists of straight-sided shapes and a curved-sided shape. the straight-sided two-dimensional shape is also called as a polygon. Polygon is a simple closed curve that are closed by three or more line segments (Tiurlina, 2006) for example Triangles, Quadrangles, Pentagons, Hexagons, and etc.

Mathematics learning should be based on student experience, this is because mathematics is an abstract science. One approach that can be used

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in the learning mathematics process is by applying the RME approach.

From the results of the understanding above, students should not be seen as passive recipients–ready-made. According to them, education must direct students to the use of various situations to rediscover mathematics in their own way.

Based on the results of previous studies, it can be drawn a research hypothesis where the hypothesis is a temporary answer to the problem under study, the answer is still theoretical and is considered to be true before it is proven to be true (empirical data) which obtained in the class in classroom action research (Latipah, 2015).

The hypothesis can be interpreted as a temporary answer toward the research until it proved through the data collected (Suharsini Arikunto, 1993). The action hypothesis in this study is: "Realistic Mathematics Education (RME) approach can improve student learning outcomes in solving problems about two-dimensional shapes".

B. Research Methodology

This research was conducted at SDN Pandeglang 14 in Pandeglang District, Pandeglang-Banten Regency. The location of this research was based on observations of Grade 6 students conducted by the researchers. The respondents in this research were 24 students that consist of 17 male students and 7 female students. In accordance with the formulation of the problem, this research uses a classroom action research (CAR) method. The rationale of this method is done in accordance with the time of learning activities. CAR is an effort to improve the quality of education in grade 6 of SDN Pandeglang 14. Classroom action research is a form of reflection research conducted by educators themselves towards the curriculum, school development, improvement of learning achievement, development and improvement of learning.

Moreover, according to Shuardjono (2008) that class action research is action research conducted with the purpose of improving the quality of learning practices in the classroom. The form of CAR implemented is a reflection

collaboration. Reflection means that CAR is done continuously to get an explanation of progress, improvement, decline, lack of effectiveness and etc.. This was used to improve the action process in the next cycle of the activities. Collaborative means that CAR is a joint effort from various parties to realize the desired. In this research, the teacher as the party who took the action, while the researchers as the observer of the ongoing process of action.

In data collection, the researchers conducted two data collection techniques namely student observation sheets and test questions. Observation sheet (observation) is observing the results of the impact of actions taken or imposed on students (Yusnandar, 2008: 24), The observations used by researchers were observation sheets about student activities in mathematics learning with the RME approach. AStudent activities are the activities of the student during the learning process. The purpose of this observation is to collect data on the Mathematics learning process. This student activity observation sheets are used by researchers starting from the pre-cycle, cycle I, cycle II, and cycle III. On these student activity observation sheets consists of five researchers aspects, each aspect has 4 Indicators.

The test is a way to make an assessment in the form of a tasks or task series that must be done by the child to produce a score about the child's behavior or achievement, which can be compared with the scores achieved by other children or with specified. The tests given to students were 5 questions. Each question is given 2 points so that when students are correct all will be given 10 points.

After the researchers collecting data from the results of observations and tests, then it analyzed by applying statistical techniques to calculate the average score of the test results conducted. This is done to find out the differences that occur before the research and after the research, so it can conclude or answer the hypothesis that has been presented previously.

C. Research Result and Discussion

Pre-cycle research data shows that at this stage are found many deficiencies. Among the methods used, the teacher still uses lectures method and teacher-centered learning, not using props/teaching aids that can be seen by children in daily life. This causes students to be less motivated and the learning process becomes passive and this influence on student learning outcomes.

In cycle 1, there has been an improvement in the way of learning using the Realistic Mathematics Education (RME) approach and have used media or learning aids and learning activities seems to be more effective, but only some students participate in learning.

In cycle II, has starting to master the planning of learning as desired and the learning implementation runs well. The use of concrete teaching aids in learning gives motivation to students to pay attention to the teacher in delivering the two-dimensional shape material.. Some students have actively participated and enthusiasm in the lesson and student learning outcomes have shown improvement even though not as expected yet.

In cycle III, learning activities using the Realistic Mathematics Education (RME) approach have been seen to be active. Because students are already active in discussing and reporting the results of their group work. Learning outcomes are more increased as expected by researchers.

Thus it can be concluded that RME is known as a successful approach in the Netherlands, it is shown that with RME approach, students have a higher score compared to students who obtain traditional learning approaches in terms of numeracy skills, more specifically in application. Becker and Selter (Suherman,dkk, 2001).

Table 1
Recapitulation of Students Activity Observation Results

No	Students Name	Cycle I	Cycle II	Cycle III
1	Fitri	2	3	4
2	M.Rifqi	2	3	4
3	Hamdan	2	2,8	4
4	Arial	2	2,8	4
5	Firmansyah	2	2,8	3,8
6	Mulya	1,8	3	4
7	Dita Melani	2	3	4
8	Eka	2	2,8	4
9	Siti sa'adah	1,6	2,8	4

10	Syahril	1,8	2,8	4
11	Rival	2	3	4
12	Fadlan	2	3	4
13	Ahmad	2	3	4
14	Sugeng	2	3	4
15	Gita	2	3	4
16	M.Rafi	2	3	4
17	Hanan	2	3	4
18	Lukman	2	3	3,8
19	Putri	2	3	4
20	Tita	2	3	4
21	Devinita	2	3	4
22	M.Nandi	2	3	4
23	M.Fathul	1,8	2,8	4
24	M.Fajri	2	3	3,8
Total		47	70,6	95,4
Average Score		1,9	2,9	3,9

From table 1, it can be seen that the average of students activity results using the RME approach starting from cycle I obtained a score of 1.9, in cycle II 2.9, and in cycle III with a score of 3.9. Based on that table shows that the learning conducted are said to succeed in making students become active when attending the learning process. It is seen that there are significant differences in each cycle starting from cycle I to cycle III. This improvement proves that the RME learning process makes students be more active than before.

Table 2
Recapitulation of Students Learning Test Results

No	Students Name	L / P	Results of Cycle Scores			
			Pre-cycle	Cycle I	Cycle II	Cycle III
1	Fitri	P	6	6	8	10
2	M.Rifqi	L	6	8	10	10
3	Hamdan	L	2	4	6	8
4	Arial	L	6	6	6	8
5	Firmansyah	L	2	4	6	8
6	Mulya	L	6	6	8	8
7	Dita Melani	P	4	4	4	6
8	Eka	L	4	6	6	8
9	Siti sa'adah	P	4	4	4	6
10	Syahril	L	6	8	10	10
11	Rival	L	6	6	8	8
12	Fadlan	L	2	6	6	8
13	Ahmad	L	6	8	10	10
14	Sugeng	L	4	4	4	8
15	Gita	P	2	6	6	8
16	M.Rafi	L	4	4	8	8
17	Hanan	L	4	6	8	8
18	Lukman	L	4	8	6	8
19	Putri	P	6	6	8	8
20	Tita	P	4	4	8	10
21	Devinita	P	4	4	8	10
22	M.Nandi	L	2	6	6	8
23	M.Fathul	L	2	6	6	8
24	M.Fajri	L	6	4	4	6
Total			106	134	164	198
Average Score			4,2	5,5	6,8	8,2

Based on table 2, can be known that learning by applying the RME approach has succeeded in improving student learning outcomes. It seen from the students learning outcomes starting from pre-cycle obtain 4.2, cycle I 5.5, cycle II 6.8 and cycle III with a score of 8.2. These score improvements are

supported by the activeness of students learning activities so almost all students who are silent or passive can participate in learning.

Chart 1
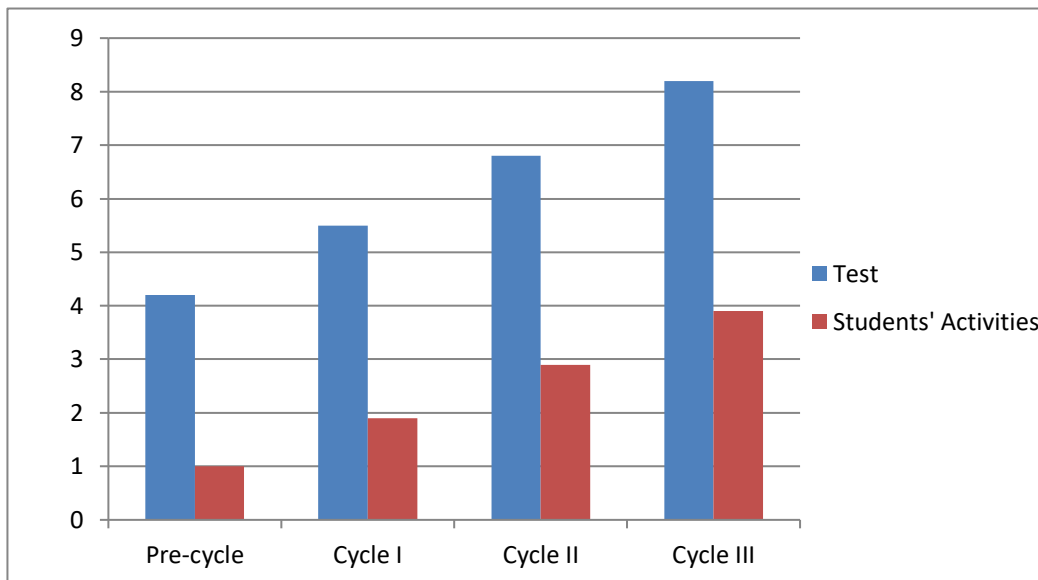**Student Learning Test Result Diagram**

From chart 1, can be seen that there are differences between the test scores and activities from pre-cycle to cycle III. Improvement of each cycle shows that there is a gradual improvement, this explains that learning that can motivate students to learn in a fun way will be more meaningful and making the students' concentration more optimal compared to the monotonous or boring learning for students.

Based on the results of the research conducted, it can be obtained that fun learning for students can further enhance student learning outcomes.

This can be seen from the improvement in activities and student learning outcomes. As explained by Freudenthal, the Netherlands in 1971 had gone through a process of testing and research for more than 25 years, Its implementation has proven successful in stimulating reasoning of student learning activities, the Freudenthal Institute developed a theoretical approach to mathematics learning, known as Realistic Mathematics Education (RME). RME combines views on what is mathematics, it must be taught so students are not passive.

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"students should not be seen as passive receivers of ready-made mathematic" Freudenthal (Sutarto, PMRI menjadikan pembelajaran lebih bermakan siswa, http/net.PMRI.com. 4 Febuari 2010).

D. Conclusion

Based on the results of observations in the field and data analysis and the results of hypothesis testing, then the results of this research can be concluded that the students' activity in learning using RME approach can improve students' activity on two-dimensional shapes. Some students have actively and enthusiastically followed the lessons, have used media or learning aids to make learning activities seem more effective.

Moreover, the students learning outcomes in solving two-dimensional shapes problems with a realistic mathematics education (RME) approach on mathematics learning, increased significantly, because the RME approach is one of the social contexts approaches to learn based on everyday life. Thus, it can be explained that the learning process that directs students to be active, and fun learning for students, can optimize the absorption of student materials.

After conducting research about improving students learning outcomes on two-dimensional shapes with a realistic mathematics education approach in grade 6 SDN Pandeglang 14, Pandeglang Regency, the researchers advises the Principal as a decision-maker in the school, that the Principal must be more able to improve the quality of education so the education quality, especially in elementary schools can be improved both in learning nor teaching and learning facilities. moreover, fo the teachers that the teaching and learning process would also not be good if students could not be actively involved in the process, students should be more motivated to study hard and diligently. Must be more sensitive in the quality of education because by conducting research we can see and find solutions to the existing educational problems so in the future the education quality can be more advanced in the future.

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