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The Implementation of Contextual Teaching and Learning Approach to Improve Students' Mathematics Achievement at Grade VII SMP Negeri 3 Makassar

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ABSTRACT

This study is classroom action research that aims to improve students' mathematics learning outcomes of SMP Negeri 3 Makassar through contextual teaching-learning. The way of the study covered four-step namely planning, action, observation, and reflection. The research subjects were grade VII₆ students of SMP Negeri 3, which covered 39. The study took place for two cycles. Data gathering was administered by using a learning outcomes test and by observing teaching activities. The data collected were analyzed using descriptive analysis. The results of the descriptive study showed that: (1) after executing the action of contextual teaching and learning, there was an improvement of the average score of mathematics learning outcomes of grade VII₆ student of SMP Negeri 3 Makassar in the topic of a triangle, which was 59.61 at the end of the first cycle and became 74.92 at the end of the second cycle, (2) after executing the action of contextual teaching and learning, there was an improvement of the mastery of mathematics learning of grade VII₆ students of SMP Negeri 3 Makassar in the topic of a triangle, which was 48.72% at the end of the first cycle and became 89.74% at the end of the second cycle, (3) the students' responses toward the implementation of contextual teaching and learning tended to be positive, such as mathematics was more attractive, more enjoyable and easier to understand and the students' knowledge more developed, (4) students' interest attention and motivation improved in learning.

Keywords: Contextual Teaching and Learning, math learning outcomes.

1. INTRODUCTION

The progress of a nation depends on the advancement of science and technology. Science and technology can be fostered within the framework and foundation of Mathematics subject. Therefore, technological progress significantly depends on the level of Mathematics Mastery.

Elementary school and high school as a nine-year compulsory education is one of Mathematics learning objectives. Mathematics is a medium of scientific thinking needed by every student to develop their logic. For this reason, the teaching system should be designed well thus the students do not get misconception material

from the teacher. If the students got the tricky concept in the first place, then it will affect their subsequent learning progress. [1] revealed that the emphasis of learning mathematics is on practicing skills and memorizing and understanding concepts. Not only on "how" a problem should be solved but also on "why" the problem is solved in a certain way. It is also in line with [2] stated that (1) How to teach mathematics so that students enjoy this lesson, or at least do not hate it, (2) How to teach mathematics so that students easily understand it, (3) What material is taught so that this mathematics lesson does seem useful both in sciences and in everyday life.

To overcome the above problems, a teacher should choose and provide the right teaching to students by applying the Contextual Teaching and Learning model.

Contextual Teaching and Learning is a learning concept that helps teachers connect the material that teach to students' real-world situations. As [3] states, Contextual Teaching and Learning Approach helps students understand what they are learning by connecting their subject with their lives context. The teacher also encourages students to make connections between their knowledge and its application in their daily lives. The learning process works naturally. In this phase, students experience the topic and a knowledge transfer process from teacher to student. In a contextual classroom, the teacher's job is to help students achieve their goals. This means that teachers are more concerned with strategy than providing information. One way to improve students' skills and critical thinking ability is by developing learning tools based on CTL [4]. Supporting the statement, Putu (2019) explains that Approach Contextual Teaching and Learning (CTL) presents lesson material by exposing students to problems that must be solved or resolved to achieve educational goals. This approach is expected to increase students' understanding of mathematical concepts so that students' mathematics learning outcomes will significantly increase. This kind of learning condition is still rarely applied in schools. Almost all levels of education, both secondary education and basic education, including Junior High School (SMPN) 3 Makassar.

Based on the above thoughts, the authors are interested in conducting a research entitled: The Implementation of Contextual Teaching and Learning Approach to Improve Students' Mathematics Achievement at Grade VII SMP Negeri 3 Makassar

2. METHOD

This research is a classroom action research conducted at Junior High School (SMPN) of 3 Makassar with 39 students. These students have varying abilities, ranging from students with low, medium, and high skills.

The implementation of this classroom action research is guided by the CAR steps in the Ministry of National Education (2004). This model is a reference for various action research models. The main components in this action research are:

2.1. Planning

At this stage, the steps taken by the researcher are:

- a. Reviewing the mathematics learning materials for the 2nd grade of Junior High School (SMPN) in even semesters to allocate time and materials that can use Contextual Teaching and Learning.

- b. Create a learning plan based on Contextual Teaching and Learning
- c. Prepare the media used in learning.
- d. Prepare small groups (4-5 people) if necessary, group work to implement Contextual Teaching and Learning models.
- e. Making observation guidelines to record the learning process in class
- f. Creating an evaluation tool to find out whether students have been developed through Contextual Teaching and Learning conceptually and procedurally
- g. Completing a questionnaire of student responses and suggestions on applied learning.

2.2. Implementation

- a. Identify the student's condition in the form of interest and readiness
- b. Divide students into small groups
- c. Each group observes, records, and concludes objects/models with the material being studied.
- d. The groups are represented by a member of each group to present the results.
- e. For each meeting, the teacher records all events that are considered important, both regarding student activities in the following lessons and responses given by students.
- f. Doing reflection for the next meeting.
- g. Give a final test for cycle I.

2.3. Observation

During the discussion, the researcher acts as an observer of all existing groups. The things that the author observes are:

- a. Students' ability to understand the concepts learned during the cycle I
- b. Student activity in groups, in the form of student activity in discussing, asking, and answering questions.
- c. The cohesiveness and cooperation showed by students in their groups\
- d. The difficulties experienced by students in solving practice questions.

2.4. Reflection

The data obtained by observation were analyzed qualitatively by making notes related to things experienced by students during the Contextual Teaching and Learning model and quantitatively by examining the scores obtained by students from the final test of Cycle I. As a result, appropriate action is taken to improve student learning outcomes. Both analyzes are a reference for researchers to plan for the next cycle.

The activities carried out in Cycle II are relatively the same as the planning and implementation in Cycle I by making improvements or additions adjusted to the results of the reflection of Cycle I. The activities in this cycle are repeated in a spiral form, allowing smaller cycles to occur, where each cycle is the improved part of the previous process.

3. ASSESSMENT CRITERIA

The criteria for student success in the learning process are as follows:

- a. The increasing number on the average score of students' Mathematics learning outcomes after the Contextual Teaching and Learning implementation.
- b. In addition, indicators for improving student learning outcomes include the increasing number of student activities in the learning process, which can be seen on the observation sheet, which includes:
 1. The ability to answer the teacher's or friend's oral questions.
 2. The ability to ask questions, feedback, or comments that are positive.
 3. The courage of students volunteered to solve the problems on the blackboard.
 4. The presence of students and the number of students who are not concentrated in participating during the learning process.
 5. Able to work together and participate in the group.

4. DATA ANALYSIS

The collected data were analyzed using quantitative and qualitative analysis. The type of quantitative data used is descriptive analysis, namely the average score and percentage. In addition, the standard deviation, frequency table, minimum and maximum values that students get in each cycle will also be determined.

As for the qualitative data, the criteria for determining the category refers to the standard categorization technique set by the Ministry of Education and Culture (Sutriani, 2004: 19) as follows:

1. Values 0 – 34 are categorized as "very low."
2. Values 35 – 54 are categorized as "low."
3. Values 55 – 64 are categorized as "medium."
4. Values 65 – 84 are categorized as "high."
5. Scores of 85 – 100 are categorized as "very high."

To see mastery learning classically, the criteria for completeness according to the Ministry of Education and Culture in [6] are 85% with complete individual categories if students can achieve a score of 65% or 0.65 x maximum score.

5. RESULT AND DISCUSSION

5.1. Quantitative Analysis

5.1.1. Student Mathematics Outcomes of Cycle I

Table 1. Statistics of Mathematics Learning Outcomes Scores of Cycle I

Variable	Statistics Number
Research subject	39
Average	59,61
Standard deviation	13,64
Variance	186,03
Maximum score	85
Minimum score	25

The average score of students' Mathematics learning outcomes in the 2nd grade of Junior High School (SMPN) of 3 Makassar Group 6 after applying Contextual Teaching and Learning based on the final test of Cycle, I was 59.61 with a standard deviation of 13.64. This shows classically that class VII6 students of this school only have final mastery in the first cycle of 59.61. While individually, the scores achieved by students spread from a minimum score of 25 to a maximum score of 85.

If the scores of students' mathematics learning outcomes are grouped into five categories, then the score frequency distribution is shown in table 2 below:

From the table above, it can be seen that there are 7.69%

Table 2. Distribution of the frequency and percentage of Mathematics learning outcomes of the first cycle

No	Grade	Category	f	%
1	0 - 34	Very low	3	7,69
2	35 - 54	Low	6	15,38
3	55 – 64	Medium	11	28,21
4	65 – 84	High	18	46,15
5	85 - 100	Very high	1	2,56
Total			39	100

of students whose learning outcomes are in the very low category, 15.38% of students are in a low category, 28.21% in the medium category, 46.15% in the good category, and students whose learning in the very good category of 2.56%.

The description of students' classical mathematical mastery after the implementation in the first cycle is shown in the following table:

Table 3. Description of Students' Classical Mathematics Learning Completeness in Cycle I

Score	Category	f	(%)
0 - 64	Uncompleted	20	51,28
65 - 100	Completed	19	48,72
Total		39	100,00

From table 3, it can be seen that there are 20 people (51.28%) who have not completed studying and 19 people (48.72%) who have finished studying. This shows that classical learning completeness has not been achieved in the first cycle because based on the criteria for good learning outcomes, it refers to learning mastery. A class achieves learning mastery if 85% of students have achieved 65% absorption or more.

5.1.2. Student Mathematics Outcomes of Cycle II

Table 4. Statistics of student learning outcomes of Cycle II

Variable	Statistics Number
Research subject	39
Average	74,92
Standard deviation	12,37
Variance	153,02
Maximum score	100
Minimum score	50

The average score of students' Mathematics learning outcomes in the 2nd grade of Junior High School (SMPN) of 3 Makassar Group 6 after applying Contextual Teaching and Learning based on the final test of the second cycle was 74.92 with a standard deviation of 12.37. This shows that classically class has final mastery in the second cycle of 74.92. Compared with student scores in the process I, there was an increase in the average score of 15.31.

If the scores of student learning outcomes are grouped into five categories, then the score frequency distribution is shown in table 5 below:

Table 5. Frequency Distribution and Percentage of Mathematics Learning Outcomes Scores

No	Grade	Category	f	(%)
1	0 - 34	Very low	0	0
2	35 - 54	Low	1	2,56
3	55 - 64	Medium	3	7,69
4	65 - 84	High	28	71,79
5	85 - 100	Very high	7	17,95
Total			39	100

Table 5 above shows that in the final test of Cycle II, there are 0% of students whose learning outcomes in Mathematics are very low. 2.56% of students are in a low category, 7.69% in the medium category, 71.79% in the high category, and students whose learning outcomes are in the very high category of 17.95%.

A quantitative description of students' classical Mathematics learning mastery after giving the action in cycle II is shown in table 6 below:

Table 6. Description of Students' Classical Mathematics Learning Completeness in Cycle II

Score	Category	Frequency	(%)
0 - 64	Uncompleted	4	10,26
65 - 100	Completed	35	89,74
Total		39	100

Table 6 above shows that from 39 students, 35 people (89.74%) have completed studying, and 4 people (10.26%) have not completed studying. This indicates that in the second cycle of classical learning, completeness has been achieved.

5.2. Qualitative Analysis

5.2.1. Changes in Student Learning Behavior in the Learning Process

As an effort to improve Mathematics learning outcomes for 2nd grade of Junior High School (SMPN) of 3 Makassar Group 6, it is inseparable from the factors of student learning behavior. Changes in student behavior are obtained from qualitative data. It is also obtained from observation sheets at each meeting recorded by researchers. Changes in student behavior can be seen from the following aspects:

5.2.1.1. Student Attendance

The students who participated in the learning activities in the first cycle were 98.07%. Attendance of students who do not reach 100% is due to illness, permission, and without information. While in the second cycle, student attendance increased to 100%.

5.2.1.2. Students who ask questions, feedback, or comments

In Cycle I, students who asked questions, responses, or comments were 7.05%. This is because most students are still afraid and embarrassed to comment. Over time, students have shown progress in asking questions; this can be seen in cycle II, increasing 13.46%. This indicates

that students are more confident and no longer feel afraid or embarrassed to ask questions, responses, or comments.

5.2.1.3. Students answer the oral questions of the teacher or friends

In the first cycle, students who answered the teacher's questions were 8.33%, while in the second cycle is increased to 19.23%. The correct answer the students give becomes the indicator of the improvement of their Mathematics mastery level.

5.2.1.4. Students who volunteer to work on the questions on the blackboard

In the first cycle, the students who volunteered were only 2.56%, while it increased to 14.74% in the second cycle. In cycle II, they began to be brave and no longer awkward to volunteer to solve problems on the blackboard.

5.2.1.5. Students who don't concentrate on studying

Students who do not focus on learning are characterized by the presence of students who only chit-chatted with friends about an unrelated topic, were sleepy, or disturbing their friends. In the first cycle, 18.59% did not concentrate on learning, while it decreased to 6.41% in the second cycle.

5.2.1.6. Students who are active in group discussions

The more engaged students in the group discussions, the higher the mastery level of the material. Students involved in their groups are characterized by their ability to answer questions from other groups, present the results of their discussions, ask questions, and formulate appropriate answers. In the first cycle, students who were active in group discussions were 12.18%, and in the second cycle, it increased to 22.44%.

5.2.2. Reflection on the implementation of the Learning Process.

5.2.2.1. Reflection Cycle I

In the first week of Cycle I research, the researcher felt some difficulties, especially dealing with students. Among them are very passive students; they just sit, remain silent, and listen. They are still awkward and do not dare to ask questions, respond to or solve the problems posed. Another obstacle that researchers face is that most students have very low mastery of Math skills. They do not understand the concepts and some Mathematical principles.

Students began to show a happy attitude to learning Mathematics after using Contextual Teaching and Learning for the next meeting because this approach always linked the material with students' real lives. This study focuses on the subject of Triangles. It is easy to make triangles and examples in the classroom related to triangles.

5.2.2.2. Reflection Cycle II

In Cycle II, the learning process is getting better. It can be seen in this cycle that more students pay attention and understand the material. The most prominent thing felt by researchers was the increasing number of students asking questions, volunteering to solve problems, and being active in group discussions.

5.2.2.3. Student Reflection Analysis

From the results of the analysis of students' reflections or responses, it can be categorized as follows:

1. Students' opinions on Math subjects

In general, students like Mathematics if they understand the material given. Thus, it requires several techniques, so the materials are understandable.

2. The teacher's practice to help students enjoy Math learning

Most of the students thought that the teacher should give a simple explanation. The teacher should be friendly and should be interspersed with positive jokes.

3. Students' opinions about Contextual Teaching and Learning.

In general, students' responses to the application of Contextual Teaching and Learning were very positive. Learning Mathematics is more accessible, relaxed, and fun because the questions are related to everyday life. The students were also allowed to work together with group members. By implementing Contextual Teaching and Learning, Mathematics lessons become more attractive, fun, and more meaningful. Eventually, there is an enhancement in students' skills and knowledge.

6. CONCLUSION

Based on the results of data analysis and the findings in the implementation of this research, it can be concluded that Mathematics learning outcomes of the 2nd grade of Junior High School (SMPN) of 3 Makassar Group 6 have increased after learning with Contextual Teaching and Learning.

7. SUGGESTIONS

1. To create a fun and meaningful learning situation, one of the alternatives that teachers should implement is a

strategy: giving a real-world example to students. Therefore, students do not feel bored. One suitable model to use is the application of Contextual Teaching and Learning.

2. This research should be used as a comparison by mathematics teachers in teaching mathematical concepts.

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