

## **Usage of Contextual Approach to Increase Student's Understanding in Learning Mathematics**

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**Abstract:** *This research is a class action (Classroom Action Research) which aims to improve student's understanding in learning mathematics of class VIII SMP Negeri 5 Watampone through contextual approach. The subjects are students of class VIII semester of academic year 2011/2012 which are 42 students. Cycle I and Cycle II respectively was implemented during 4 times meetings. The instrument of data collection is a test of student's learning outcomes performed each end of the cycle and observation. Data are analyzed by using quantitative analysis and qualitative analysis. The results showed that: (1) the first cycle, the average score of student's learning outcomes is 60.24 of the highest possible score of 100, standard deviation of 13.49 and in middle category, (2) in the second Cycle, the average score of student's learning outcomes is 65.24 of the highest possible score of 100, standard deviation of 12.49 and at the high category, (3) an increase in student attendance, (4) an increase in the activity of the students to answer questions by teachers about the material explained, the students were asked about the material that is not yet understood, the students were active during the discussion of questions, students who cooperate and participate in the group. From these results, it can be concluded that an increase in student's learning outcomes in learning Mathematics of class VIII SMP Negeri 5 Watampone by using contextual approach.*

**Keywords:** *Contextual Approach, Student's Learning Outcomes*

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### **I. Introduction**

Science and technology is believed to be contributing to the progress of a nation, so it can be said that science and technology is a fundamental variable in the development of a nation in achieving its objectives in all areas. Indonesian people need to be aware of the backwardness in science and technology so that it is need to find appropriate solutions to catch up with improving the quality of human resources through improvement and reform in education. Education is an absolute necessity for humans to build the civilization of the nation. In education, humans are taught by a variety of disciplines as one of the cornerstones of thinking in doing a civilization. One of the disciplines taught at various primary educations to university is mathematics.

One of the characteristics of mathematics has an object that is abstract. Abstract nature causes that many students have difficulty in mathematics. Jennings and Dunne [1] said that almost students have difficulty in applying mathematics in real life situations. Another thing that causes difficulty in math for students is that learning mathematics is less meaningful. Teachers in learning in the classroom do not associate with a scheme that has been owned by students and students seldom were given the opportunity to discover and construct their own mathematical ideas so that children quickly forget and can not apply mathematics in their life every day.

Such learning conditions are experienced by schools both primary and secondary education, including SMP Negeri 5 Watampone, Kecamatan Tanete Riattang barat, Kabupaten Bone. One of the arguments and assumptions behind the less satisfying the quality of the learning process in mathematics is due to learning strategies and approaches used by educators is less effective in the learning process which casuses the students do not understand the material what they learn in the classroom.

Marpaung [2] suggested that learning mathematics by relying on the power of remembering formulas and memorize concepts without understanding is meaningless. And frontal learning by practicing preposition for reducing or eliminating the aversive behavior which does not support the learning process of mathematics does not empower students to understand mathematical concepts and their linkages or relationship.

Learning mathematics requires activeness of learning to think, that the cooperation of mental, physical, and feeling in the capture, process, store, retrieve, transform information into a new structure (knowledge) and using new knowledge. National Council of Teachers of Mathematics [3] confirms that the principle of learning mathematics that the students should learn mathematics with understanding, actively building new knowledge from experience and prior knowledge. Lovitt and Clarke [4] stated that "the quality of learning characterized by how extensive the learning environment which is started from where the students are, recognizing that students learn at different speeds and in different ways, involving students physically in the learning process, and ask students to visualize the imaginary.

This once again emphasizes the importance of students' activeness role in the process of understanding and learning of mathematics. In mathematics instruction that emphasizes understanding, abilities to explore, ask questions, formulate problems, make guesses (conjectures), and solve the problem plays very important role.

The ability of the students in understanding mathematics is influenced by several factors. Upu [5] and Deska [6] suggested that one of the important things that influence students' ability to understand mathematics is the approach used by the teacher in the learning process. There is the possibility that a student has the ability of moderate or low, but the state of the approach in learning that is done by teachers draw or associate with the subject being taught then the understanding of math becomes even faster and higher academic achievement.

Therefore, the need for innovation in learning mathematics that changes in learning strategies including learning approach. The likelihood that students will learn better if it is created natural environment, learning will be more meaningful if students have what they learned, then one of effective approaches in learning process is a contextual approach. Contextual approach (Contextual Teaching and Learning) is a learning concept that helps teachers teach the link between the materials to students's real world situations and encourage students to make connections between the knowledge possessed and its application in their lives as members of the family and human society. With the concept, the learning outcomes are expected to be meaningful to students [7].

Learning process should take place naturally in students's activities, it is not a transfer of knowledge from teacher to student. Something new is the knowledge and skills of the 'find himself', rather than what the teachers' word. It is the role of the teacher in the classroom by using a contextual approach. Contextual learning is developed with the aim to be more productive and meaningful.

## II. Method

This research is descriptive research by using analysis of quantitative approach. This research is a classroom action research that aims to improve students' understanding in mathematics exactly in the material lines on the triangle. The population in this study are all the students of class VIII SMP Negeri 5 Watampone. For more details, the population can be seen in the following table:

**Table 1.** Circumstances of Population Research

No	Class	Sex		Total
		Male	Female	
1	VIII A	16	26	42
2	VIII B	21	21	42
Jumlah		37	49	84

Reference: SMP Negeri 5 Watampone, in the academic year 2011/2012

By looking at a study population of 84 students, it was determined the sample size by 50 percent who expected to represent and be a description of the study population [8]. The number of samples that is the subject of this study is  $50\% \times 84 \text{ people} = 42 \text{ people}$ . For more details, number of samples can be seen in the following table below:

**Table 2.** Circumstances of Samples Research

No	Class	Sex		Total
		Male	Female	
1	VIII A	8	13	21
2	VIII B	11	10	21
Jumlah		19	23	42

Reference: Processed from Table 1.1

This action research procedures described as follows:

- a. Preparatory actions
  - Make learning scenarios to be implemented actions with contextual approach
  - Develop a daily test.
  - Make the observation sheet to see how the conditions of teaching and learning in the classroom when the contextual approach is applied.
- b. Implementation of actions
  - Activities carried out at this stage is to implement learning scenarios both in the learning process in the classroom and on the provision of curricular tasks that have been planned on the first cycle of learning activities and the second cycle.
- c. Observation and evaluation
  - At this stage of the implementation of the actions carried out observations by using the observation sheet that has been created and carried out the evaluation. This observation was made during learning activities

take place. In cycle I, data of observation recorded in the observation sheet that includes student attendance, student activity in asking a question, do the work and give feedback. Furthermore evaluations conducted at the end of the first cycle by giving written test. It is intended to measure students' mastery of the material that has been gained during the first cycle in progress.

In the second cycle observation process similar to that performed in the first cycle while the evaluation is given a written test (final test cycle II) to determine the results achieved by the students after a given action. At the end of this cycle students are also given the opportunity to respond in writing regarding the implementation of learning with contextual approach.

d. Analysis and Reflections

The Results obtained in the stage of observation and evaluation are collected and analyzed. From the analysis, researcher reflects to see the data of observation whether the activities carried out successfully or not and what are the implications on the ability of students' understanding as seen from their achievement.

Data which have been collected from taking above then analyzed using the techniques of quantitative and qualitative analysis to analyze quantitatively used descriptive statistics that the average score and percentage, standard deviation, frequency tables, minimum value and a maximum value obtained by the students in each cycle.

**III. Result And Discussion**

Based on analysis of descriptive statistics was obtained a score of students's achievement Class VIII SMP Negeri 5 Watampone the first cycle activities as follows:

**Table 3.** Statistics of Students' Achievement Class VIII SMP Negeri 5 Watampone in Cycle I

No	Statistics	Statistical Value
1	Subject Research	42
2	Mean	60,24
3	Standard of Deviation	13,49
4	Variance	182,18
5	Score Range	64
6	Score of maximum	95
7	Score of minimum	31

If the students's achievement score are grouped into five categories, then it is obtained frequency distribution of scores shown in Table 4 below:

**Table 4.** Distribution of Frequency and Percentage of Students's Achievement Mathematics Score of Class VIII SMP Negeri 5 Watampone In Cycle I

No	Score	Category	Frequency	Percentage (%)
1	0 – 34	Very Low	2	4,8
2	35 – 54	Low	15	35,7
3	55 – 64	Moderate	7	16,7
4	65 – 84	High	15	35,7
5	85 – 100	Very High	3	7,1
<b>Total</b>			<b>42</b>	<b>100</b>

From table 3 and 4, it can be concluded that the results of students's mathematical achievement of Class VIII SMP Negeri 5 Watampone after being used contextual approach on cycle I is in middle category with an average score of 60.24, the standard deviation of 13.49, the ideal score of 100, the lowest score 31 and the highest score of 95. If students's achievement in cycle I is analyzed, then the percentage of students's learning completeness in cycle I can be seen in Table 5 below.

**Table 5.** Description of Students's Learning Completeness Class VIII of SMP Negeri 5 Watampone in Cycle I

Score Percentage	Category	Frequency	Percentage (%)
0 % - 64,9 %	Not Completed	25	59,52
65 % - 100 %	Completed	17	40,48
<b>Total</b>		<b>42</b>	<b>100</b>

Table 5 shows that 59.52% of the students included in the category of incomplete, it means that that approximately half of the number of students in need of repairs, and it will be attempted on cycle II of learning. Based on the analysis of descriptive statistics obtained a score of student learning outcomes Class VIII SMP Negeri 5 Watampone in Table 6 below:

**Table 6.** Statistics of Students' Achievement Class VIII SMP Negeri 5 Watampone in Cycle II

No	Statistics	Nilai Statistik
1	Subject Research	42
2	Mean	65,24
3	Standard of Deviation	12,49
4	Variance	156,03
5	Score Range	60
6	Score of maximum	95
7	Score of minimum	35

If the students's achievement score are grouped into five categories, then it is obtained frequency distribution of scores shown in Table 7 below:

**Table 7.** Distribution of Frequency and Percentage of Students's Achievement Mathematics Score of Class VIII SMP Negeri 5 Watampone in Cycle II

No	Score	Category	Frequency	Percentage (%)
1	0 – 34	Very Low	0	0
2	35 – 54	Low	4	9,5
3	55 – 64	Moderate	16	38,2
4	65 – 84	High	19	45,2
5	85 – 100	Very High	3	7,1
<b>Total</b>			<b>42</b>	<b>100</b>

Based on table 6 and 7, it can be concluded that the results of students's mathematical achievement of Class VIII SMP Negeri 5 Watampone after being used contextual approach on Cycle II is in high category with an average score of 65.24, the standard deviation of 12.49, the ideal score of 100, the lowest score 35 and the highest score of 95. If students's achievement in Cycle II is analyzed, then the percentage of students's learning completeness in Cycle II can be seen in Table 8 below.

**Table 8.** Description of Students's Learning Completeness Class VIII of SMP Negeri 5 Watampone in Cycle II

Score Percentage	Category	Frequency	Percentage (%)
0 % - 64,9 %	Not Completed	18	42,86
65 % - 100 %	Completed	24	57,14
<b>Total</b>		<b>42</b>	<b>100</b>

Table 8 shows that the percentage of students's completeness in Cycle II is 57.14% . It means that 24 of 42 students included in the category of complete and 42.86% or 18 of 42 students included in the category of incomplete. Furthermore, Table 9 shows the increase in students' understanding on lines of the triangle after learning with contextual approach implemented in the Cycle I and the Cycle II.

**Table 9.** Comparison of Scores Each Cycle

Cycle	Score of Students's Achievement (N = 42)			
	Maximum	Minimum	Mean	Median
I	95	31	60,24	65,50
II	95	35	65,24	59,00

Table 9 above shows that, the average (mean) students's score from the first cycle to the second cycle, there is an increase of about 5.00. It means that one of the existing performance indicators are met which is an increase students's mathematical achievement of Class VIII of SMP Negeri 5 Watampone second semester of the school year 2007/2008 by applying contextually approach.

Furthermore, the data obtained will be analyzed with qualitative analysis to see description qualitatively related to learning with contextual approach. The result of the qualitative analysis is a reflection from both learning cycle as follows:

a. Reflections on the Implementation of Cycle I

In general, students enjoy learning of mathematics by applying a contextual approach, because the material presented to students is always related to real situations in everyday life, fun, and meaningful. Nevertheless, there are still some students who are passive in learning, for example just silence, doing other activities while learning takes place. Students who behave passively generally do not understand the material given because they are less attentive and tend to shy away from mathematics.

b. Reflections on the Implementation of Cycle II

Generally, it can be argued that the attention and involvement of the student show progress. Students's activeness in learning process are indicated by students's attention during the discussion of the subject matter, active in doing exercises development, lack of student conduct other activities during the learning

takes place, cooperation in doing worksheets, collect assignments on time, and increasing students' understanding of the material "Lines On Triangle". This has a positive impact in improving learning outcomes.

Besides an increase in the ability of understanding of mathematics lessons on the subject "Lines On Triangle" from cycle I to cycle II, there is also a change of attitude in the learning process. Such changes are qualitative data obtained from the observation sheet at each meeting were recorded on each cycle. The changes are:

- a. Improvement of frequency of students's attendance from cycle I to cycle II. This suggests that students have a will and determination to follow the lessons.
- b. Students's attention during the learning process from cycle I to cycle II showed an increase with the increasing number of students who pay attention to suppression of a material, answer questions, ask questions about the material that has not been understood, and active during discussing and solving example problems.
- c. Cooperation and participation during working paper and pen test in groups is increasing.
- d. Appearing students's self-awareness to do the homework given and providing the tools necessary lessons.
- e. Students's feedback about contextual based learning, generally, they commented that by seeing the real objects that exist in everyday life and directly measure it easier to understand and fun as well as more effective.

#### **IV. Conclusion**

From the results of a classroom action research conducted during two cycles, it can be concluded that by applying a contextual approach in learning mathematics can improve students' mathematics achievement of Class VIII SMP Negeri 5 Watampone from the average score of the exam results of cycle I of 60.24 increased in cycle II of 65.24. Additionally, this approach can enhance the activity of students in learning mathematical process based the results of observation during these procedures.

#### **References**

- [1] Rahma, Sitti. *Meningkatkan Pemahaman Pembelajaran Matematika kelas IIC SMP Negeri 21 Makassar pada Pokok Bahasan Lingkaran Melalui Pendekatan Kontekstual*. Bachelor Thesis. Makassar: Faculty of Mathematics and Natural Science, 2005.
- [2] Marpaung, Y. *Perubahan Paradigma Pembelajaran Matematika di Sekolah*. Paper presented in National Seminar of Mathematics Education in University of Sanata Dharma, Yogyakarta, Indonesia. 2003.
- [3] National Council of Teachers of Mathematics, *Principles and Standards for School Mathematics*. Reston, Va: NCTM. 2000.
- [4] Departemen Pendidikan Nasional. *Pendekatan Kontekstual (Contextual Teaching and Learning)*. Jakarta: Dirjen Pendidikan Dasar dan Menengah. 2003.
- [5] Upu, H. *Problem Posing dan problem Solving dalam Pembelajaran Matematika*. Makassar: Pusaka Ramadan. *This heading is not assigned a number*. 2003
- [6] Deska, D. *Memahami Contextual Teaching for Learning*. Majalah Gerbang, edisi 10 Th. III, 2004. 36-38.
- [7] Departemen Pendidikan dan Kebudayaan. 1997. *Kamus Besar Bahasa Indonesia*. Jakarta: Balai Pustaka.
- [8] Hadi, Sutrisno. *Statistik Jilid II*. Fakultas UGM. Yogyakarta. 1986.