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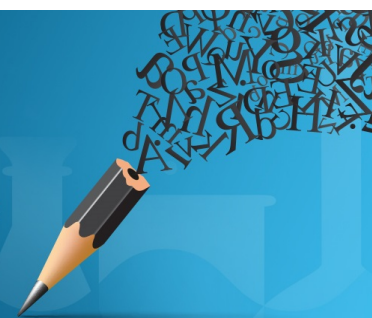


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# The Effectiveness of Mathematics Learning Through Contextual Teaching and Learning Approach in Junior High School

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**Abstract.** This research is the pre-experimental study involving one class as an experimental class with the aim to know the effectiveness of mathematics learning through the application of Contextual Teaching and Learning (CTL) approach to students of Junior High School. This study refers to three criteria, namely the achievement of learning effectiveness in the classical mastery learning, student activities related to learning activities, and the positive response of students to the implementation of learning with CTL approach. The study design used is the one-shot case study. Unit experiment in this research is class many as 29 people as a class test to be applied CTL approach.. The results showed that: (1) The average score of the final test (posttest) the results of students' mathematics learning was 81.62 with a standard deviation of 7.18. From these results showed that 28 students (96.55%) have achieved mastery of individuals and that means the classical completeness has been reached. (2) Average percentage of students achieving the expected frequency of effective activity, is 76.3%. (3) Questionnaire student responses indicate that students' response to the positive CTL approach that is 77.87%. Therefore, it can be concluded that the CTL approach in mathematics effectively in Junior High School.

## INTRODUCTION

Mathematics is a subject which always exists in education system, both basic and intermediate education system. Mathematics needs to be given to all students starting from elementary to provide them with logical, analytical, systematic, critical, and creative thinking, and the ability to work in a team [1].

Mathematics is a subject that has an enormous role in aspect and the development of human lives , especially for students, because it works for developing the ability of communication by using symbols and mot of intelligence to solve problems which is happen in daily life [2]. Based on [3] mathematics is an important instrument that uses for solving the problems, both science and daily life, and helping people with creative and critical thinking. Furthermore, mathematics can initiate the concept to think logically and systematically [4]. However, the gripe in learning mathematics that are most heard in the education world are most students in primary school complaint because of the difficulty to understand the questions of mathematics. It is because mathematics is a field related to numbers and this redirects the attention of the students to learn and a boring subject and it becomes a subject [5] in which the students hate [6]. In addition, mathematics became difficult because many teachers who teach it with non-attractive topics and methods, in which the teachers explained while the students, only took notes [7]. This learning method is dominated by teacher whilst the students are inclined passive to receive the formulas without any contribution to the learning process. Thus, it is impossible for students to maximize and to develop the understanding of the insight and the skill that became the learning goals [8].

A good lesson is a lesson which is given by teachers based on the learning structure and activity that is very leading [9]. Indeed, the style and the structure supported the learning process will give a contribution to students' involvement [9]. According to [10] teachers have an active role in the learning process and are an important position in the effective learning process. The skill that has been possessed by a teacher should be relied on learning process, including in deciding the learning method that is suitable to the topic because the effectiveness of learning can be achieved if the learning process is suitable to the topic that is taught [11]. This is an important aspect of students learning because the students need the related strategy in arranging their effort [12]. The right method and strategy used by students will help in the success of learning. The good learning method can increase students' ability to do the activity within positive response in the learning process so it can create an effective learning process [13].

The word of "effective" can be defined as a thing that can give a result. The effectiveness can be defined as a success level that can be reached by a good method to achieve a specific aim. According to Slavin [10] a learning process can be addressed effectively if the learning goal can be achieved, both the aim and maximized accomplishment of learning. As a consequence, the indicator of effectiveness is (1) completeness of mathematics learning achievement of the students; (2) the activity of students in the learning process; (3) positive response of the students to the learning activity. Therefore, in mathematics learning process is needed a new learning method that can empower the students, not by memorizing the facts but by enlightening them to develop the insight in their own brain. One of the methods which are suitable to use is Contextual Teaching and Learning (CTL) method.

Contextual Teaching and Learning (CTL) is an approach created the daily life or student's problem as their learning object [14]. Mathematics lesson with CTL is implemented by utilizing occasions or objects from students' daily lives. Based on Nurhadi [15], contextual learning is a learning concept which can help teachers to tie between the topics and the implementation in students' lives. This kind of learning method can lead the students to respond every trouble well. It is because, in everyday lives, students have recognized the problems. [16] said that CTL is a learning concept which can help the teachers to relate the lesson to the everyday life and motivate the students to relate between their insight and everyday life concept. While Howey R Keneth [15] defined the contextual learning as a teaching activity that allows the students implement their insight and academic ability in plenty context in and out of school to solve the problems by their selves or others. Principles of CTL can facilitate the students to understand the instructional subject and expand the creative thought of students, so they can tie between their knowledge and the real life [17]. The context using this method related to the experience, private life, society and the environment.

## **METHOD**

This research is based on pre-experiment which used one shot case study design. A sampling of this research is students of 8th grade at a Junior High School in Makassar and total sample is 29 students and used simple random sampling as took sample technic. Instrument used is an instrument of test, questioner and observation sheets. The test instrument used to measure the result of students mathematics learning, observation sheets used to perceive the students' activity in learning process, and the questioner sheets used for knowing the response of the students.

The learning process on this research followed the syntax of Contextual Teaching and Learning (CTL). In this step, the researcher applied the method in the learning process as a lesson plan that has arranged, did the observation of students' activity by the observer, distribute the questioner of students' response, and measured the result of student's learning after implementing the contextual teaching and learning.

## **RESULT AND DISCUSSION**

Data description of the research about the students' learning achievement, activity and response to the mathematics learning by using contextual teaching and learning shows below:

### **Description of Students' Learning Achievement**

To know the students' learning achievement, the researcher gives some tests to the students after implementing contextual teaching and learning. Table 1 below shows the analysis result of students' learning:

**TABLE 1.** Statistics of students' learning achievement score

Statistics	Statistic Value
Sample Measurement	29
The highest value	95
The lowest value	65
Ideal Score	100
Value Range	30
Mean	81.62
Median	83
Variance	51.60
Standard of Deviation	7.18

As we can be seen from the table above that the students' learning achievement score after using contextual teaching and learning method gives information that the mean is 81.62. Based on the score if it conversed in the fifth category, then the average score of students' learning achievement since using contextual teaching and learning is higher. Furthermore, the data is analysed by the achievement criteria in table 2 below:

**TABLE 2.** Description of students' learning achievement .

Interval Score	Category	Frequency	Percentage
$0 \leq x < 70$	Not Completed	1	3.45
$70 \leq x \leq 100$	Completed	28	96.55

As the table provides that the student who not achieves the minimum score is one student with percentage 3,45%, while the students who achieve the minimum criteria per person are 28 students with percentage 95,55%. Thus, it can be concluded that contextual teaching and learning) method can fulfil the classical learning achievement which means the method is affective to do in mathematics learning.

### Description of Students' Response

For the students' response indicator, the researcher uses observation instrument with twelve questions. Description of students' response is shown in the table 3 below:

**TABLE 3.** Description of students' response

Question Description	Students Who Answer Yes	Percentage (%)
Do you think that mathematics is a fun lesson?	26	89.66
Does the learning activity that the teacher uses make you interested in learning mathematics?	26	89.66
Does the learning activity that the teacher uses facilitate you in understanding the topics of mathematics?	20	68.97
Does the learning activity that the teacher uses encourage you to communicate your idea?	24	82.75
Do you prefer mathematics learning activity by your teacher or the other teachers?	16	55.17
Do you enjoy answering mathematics question with your friends?	27	93.10
Do you have more motivated after learning mathematics from your teacher?	22	75.86
Do you understand the mathematics after your teacher gave you the explanation?	24	82.75
Do you like asking and answering the question in learning mathematics?	27	93.10
Do you like learning mathematics by self-taught?	20	68.97
Do you like to be given the achievement after every meeting class?	23	79.31
Do you like to be given a homework at the end of every mathematics class?	16	55.17
Total		934.47
Average		77.87

Based on the explanation above about the students' response, it shows that the average of students' response percentage taught by using Contextual Teaching and Learning (CTL) method is 77.8%. Thus, it can be concluded that the positive response of students to the mathematics learning by Contextual Teaching and Learning (CTL) method has fulfilled the students' response criteria is 75%. It means Contextual Teaching and Learning (CTL) method is effective to apply in mathematics learning process based on the students' response.

### Description of Students' Activity in Learning Process

To know the students' activity in mathematics learning using contextual teaching and learning, the researcher will do some observations with seven primary components as the ways of the method. Table 3 below shows the analysis result of students' activity:

TABLE 4. Description of students' activity in learning process

Watched Component	Meeting					Average	Percentage (%)
	1st	2nd	3rd	4th	5th		
Positive Activity							
Students attend in the learning process	26	29	27	25		26.75	92.24
Students ask and communicate the idea to the teacher or friends. (Asking and Constructivism)	23	27	24	23		24.25	83.62
Students give an example about the topic related to the everyday life (Modelling)	23	26	25	20	P O S T  T E S T	23.50	81.0
Students solve the problems, or find the way to solve contextual problems well (Inquiry)	23	26	23	21		23.25	80.2
Students are active in learning group i.e. discussion, communicating the ideas, and so on. (Learning Society)	25	28	26	22		25.25	87.1
Students encourage their self to present the work result in front of the class	23	26	24	23		24.00	82.8
Students draw the conclusions about a concept or procedure (Reflection)	9	7	8	8		8.00	27.6
Total	152	169	157	142		155	76.3
Average	21.7	24.1	22.4	20.3		22.1	
Percentage of average (%)	74.8	83.2	77.3	69.9		76.3	
Negative Activity							
Students work other activities in the class, as long the learning process runs	4	5	6	4		4.75	16.4
Total	4	5	6	4		4.75	
Average	4	5	6	4		4.75	
Percentage of average (%)	13.8	17.2	20.7	13.8		16.4	

The table above shows that the percentage average of students' active activity to the mathematics learning, start from the first to the seventh component of percentage average is 76.3%. It means that students are active in mathematics learning process which means contextual teaching and learning method is effective to be applied in mathematics learning activity based on students' learning activity.

Based on the students' mathematics achievement in the 8th grade after the studying and learning process using Contextual Teaching and Learning (CTL) method, the average value is 81.62 and deviation standard is 7.18. The score achieved by the students spread from the lowest score is 65 to the highest score is 95 and the range score is 30. If the learning achievement taught by using Contextual Teaching and Learning (CTL) method grouping in five categories, 29 students attend the test of learning achievement, no student has score in interval of  $0 \leq x < 54$  and the percentage is 0%; one student has score in interval  $54 \leq x < 70$  and the percentage is 3.45%; seven students have scored in interval  $70 \leq x < 80$  and the percentage is 24.14%; 17 students have score in interval  $80 \leq x < 90$  and the percentage is 58.62%, and four students have score in interval  $90 \leq x \leq 100$  and the percentage is 13.79%. Then, the frequency of performance result is analysed based on the successful achievement criteria. Furthermore, only one student does not achieve and the percentage is 3.45%, whereas the students who have achieved the successful achievement criteria are 28 students and the percentage are 96.55%. If it is connected to the classical achievement criteria, it can be concluded that the result of students' learning using CTL method fulfils the classical criteria. Based on the students' activity results since the learning process using the CTL method, it is gained that the average percentage of students' active activity start from the first to the fourth meeting is 76.3%, while the number of students' passive activity is 16.4%. It makes the students are active, so it decreases the teacher's domination in the learning process in the class. According to [18], Contextual Teaching and Learning (CTL) method is a way which allows students active in the learning process to find the concept which is taught from the basic insight and experience of the students. This result is suitable to the statement of [19,10] that CTL method is effective to apply in learning mathematics.

Piaget [19] said that learning can give students a new effort in creating something new with connecting it to their own experience and thought. When students connect mathematics to the everyday life, then they can watch the relationship between the concept that can learn and the concept that has learned in the class. In addition, [16] said that contextual teaching and learning can motivate the students to get the maximum result because students can tie between their insight and the daily concept.

Based on the students' analysis result of CTL is gained that average value is 77.87% from 12 question aspects about mathematics learning using Contextual Teaching and Learning (CTL) method. Thus, the response of students to mathematics learning through Contextual Teaching and Learning (CTL) method is positive because it has satisfied the students' response criteria that reach 75%. It is suitable to the statement of [20] that CTL can give a positive response when it is applied in the learning process. The positive response happens because the learning process using Contextual Teaching and Learning (CTL) method supports the effective learning from the positive interaction and it can increase the memory of students [21].

## CONCLUSIONS AND SUGGESTIONS

Based on the result explanation above, it can be seen that completeness of students' learning meets the percentage, 96.55%, and categorizes effective. In the analysis of students' activity and response in learning mathematics, it categorizes effective, which every single percentage is 76.3% to students' activity and 77.87% to students' response. To sum up, learning mathematics using Contextual Teaching and Learning (CTL) method is effective to be applied to students in Junior High School based on the students' learning completeness, activity in the learning process, and positive response to the learning activity.

Learning mathematics using Contextual Teaching and Learning (CTL) method can be applied in the school to be created effective learning method for students, especially for students of junior high school. The limited powers of the researcher are time, facilities, and infrastructure so the researcher cannot watch further about other results of CTL method. Therefore, it is expected to other researchers can do the further research about CTL method based on the various aspects and perspectives.

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