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Increasing Learning Result of Pythagoras Material through Geogebra Application Media of VIII4 Grade Students at SMP Negeri 12 Parepare

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Abstract
This research was a classroom action research that aims to know that the used of geogebra application media could improved the learning outcomes of phytagoras material of VIII.4 grade students at SMP Negeri 12 Parepare.The subjects of this research were students of class VIII.4 at Junior High School 12 Parepare which amounted to 20 people. This research was conducted in two cycles, each of which was three meetings of the learning process and one meeting in conducted the result of learning test of phytagoras material. The data collection techniques used in this research were test techniques and observation techniques.Based on the results of the research and discussion for two cycles, it can be concluded that the results of learning materials phytagoras on students of class VIII.4 SMP Negeri 12 Parepare increased from cycle I to cycle II. This was indicated by: (1) Average score of learning result of phytagoras material of student that was 77,65 in cycle I increase to 91,54 in cycle II. (2) The achievement of students' learning mastery from cycle I was 70% increased to 100% in cycle II, or completely classical. (3) The increased of percentage of student activity average in learning process that was 43,33% in cycle I become 53,33% in cycle II.
Keywords—GeoGebra, Learning Outcomes, Pythagoras

INTRODUCTION

Media is a communication component that is as a messenger from communicator to communicant (Daryanto, 2010). In this case, the media meant here is a medium of learning. An entertaining and interesting media will attract students' attention, so the selection of learning media is the first step in determining the outcome of the arrival of the subject.

One effort that can be done to improve the results of learning mathematics, especially on Pythagoras material is by using GeoGebra application. GeoGebra is a computer application created to facilitate the learning of mathematics, especially in geometry, algebra and calculus (Judith, 2008). In the use of GeoGebra application media, the teacher can immediately draw at once explain wake up space. GeoGebra application media is expected to attract students' attention, so it can spur the spirit of learning from within students. The emergence of questions was an indicator that the student was concerned during the learning process takes place.

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Some research results indicate that the use of geogebra application media could improve student's mathematics learning outcomes. One of them was research (Suyadi, 2015) which reveal the influence of geogebra software on mathematics learning result of junior high school students. Similarly, Wahyuningsih's research (Wahyuningsih, 2013) about the experimentation of the used of geogebra in the circle material that provides an increase in mathematics learning outcomes of junior high school students.

Based on the description that has been put forward, then the problem in this research formulated as follows "whether or not the results of learning materials phytagoras can be improved through Media Applications Geogebra of the VIII4 grade Students at SMP Negeri 12 Parepare?".

RESEARCH METHODS

This research was a Classroom Action Research with implementation phases (Kunandar, 2013) including: planning, implementation, action, observation, and reflection.

To obtain the necessary data in this research, the research instruments used for data collection were Pythagoras Study Result Test sheets, and observation sheet (observation). The collected data was then analyzed by using descriptive statistics.

RESULTS AND DISCUSSION

This research was conducted in class VIII.4 SMP Negeri 12 Parepare on Pythagoras material through GeoGebra application media. In this research, the learning time used was 8 meetings or 16 hours of lesson, with 6 lesson meetings and 2 test result learning meetings in which each meeting consists of 2 hours lesson. The description of research results as follow.

1. Description of Test Result Analysis of Phytagoras Material in Cycle I

Cycle I held 4 (four) meetings. Three meetings were held in the learning process and once a meeting was conducted a concept comprehension test which was an essay form. The implementation of learning in cycle I was held at the first meeting until the third meeting or on August 15, 2016, August 18, 2016, and August 20, 2016. The fourth meeting was held on 22 August 2016. For the initial meeting, the researcher explained that in the learning process will be used media GeoGebra application. Each meeting was conducted by using GeoGebra application in learning. Each meeting on the implementation of learning was divided into several activities, among others: (1) Explanation of Pythagoras material by using GeoGebra application. (2) Demonstrate material taught by using GeoGebra application media. (3) Working Group Worksheet (LKK). (4) Presenting the results of group work by using GeoGebra application.

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TABLE I TEST RESULT DATA FOR LEARNING MATERIALS PYTHAGORAS CYCLE I

Statistics	Statistics Value
Subject	20
Ideal Score	100
High Scores	93,85
Lowest Score	56,92
Score Range	36,92
Average	77,65
Standard Deviation	10,83
Median	76,92

Table I shows that after used GeoGebra application media, obtained the average of test result of Pythagoras material learning was 77.65, it indicates that the results of learning Pythagoras were in high category. Furthermore, if the results of the Pythagoras study results were grouped into 5 (five) categories, it would be obtained the distribution and percentage as in Table II.

Table II Frequency Distribution and Percentage of Learning Result of Pythagoras Materials Cycle I

Score Interval	Category	Frequency	Percentage
85 – 100	Very high	5	25
65 – 84	High	11	55
55 – 64	Medium	4	20
35 – 54	Low	0	0
0 – 34	Very low	0	0
Total		20	100

Based on Table 2 shows that the frequency and percentage of learning result of Pythagoras material through GeoGebra application media in cycle I found that there were 5 students or 25% were in very high category, 11 students or 55% were in high category, and 4 students or 20% were in sufficient category.

2. The Description Analysis of Phytagoras Learning Result in Cycle I

Based on the results of the analysis, the description of learning material Pythagoras students shown in Table 3.

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Table III The Frequency Distribution of Learning Results of Pythagoras Materials in Cycle I

Score Interval	Categories of Learning Mastery	Frequency	Percentages
0 – 74	Incomplete	6	30
75 – 100	Completed	14	70
Total		20	100

Based on Table III, it shows that there were 6 students or 30% included into the incomplete category and 14 students or 70% included into the category of completed. This means there were 6 students who need improvement because they have not achieved individual completeness.

3. The Description Analysis of Student Activity Observation on Cycle I

The student activity that analyzed was student activity in learning material of Pythagoras by using media of GeoGebra plication. The types of student activities observed were: (1) Students pay attention to teacher's explanation of the material taught by using GeoGebra application. (2) Students respond or submit opinions on explanations of Pythagoras materials using GeoGebra applications. (3) Students demonstrate material taught by using GeoGebra application. (4) Students discuss with their group to solve Pythagoras material problem in LKK. (5) Students concent on the result of group discussion by using GeoGebra application media.

Furthermore, the data analysis of the percentage of student activities observed during the first cycle was presented as in Fig. 1.

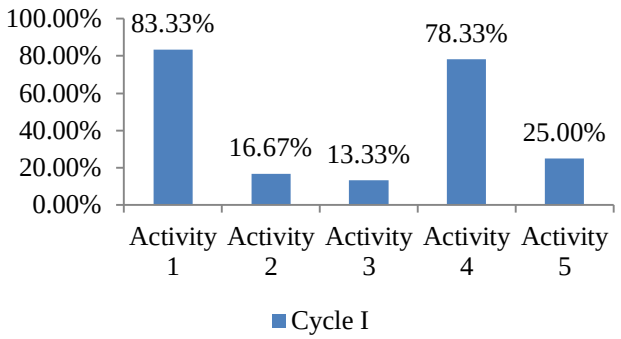

Fig. 1.The Percentage of Student Activity in Cycle I

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Information:
Activity 1 = Students pay attention to teacher's explanation of the material taught by using GeoGebra application.
Activity 2 = Student responds or submits an opinion on explanation of Pythagoras material by using GeoGebra application.
Activity 3 = Students demonstrate the taught material by using the GeoGebra application.
Activity 4 = Students discuss with group to solve Pythagoras material problem in LKK.
Activity 5 = Students concentrate the result of group discussion by using GeoGebra application media.

Based on Fig.1. it shows that the percentage of student activity pay attention to the teacher's explanation of the taught material by using GeoGebra application that was 83,33%, the percentage of student give responses or give opinion on explanation of Pythagoras material by using GeoGebra application that was 16,67%, student percentage demonstrated the taught material by using the GeoGebra application was 13.33%, the percentage of students discussing with the group to solve the Pythagoras material problem in LKK that is 78,33%, and the percentage of students presented the result of group discussion by using media of application of GeoGebra that was 25%. The average percentage of student activity in the first cycle was 43.33%.

4. *Reflection*

Table IV Constraints and Cycle Repair Efforts in II

o.	Obstacles	Improvement Efforts
	Some students did not pay attention to the researchers explaining the pythagoras material through the geogebra application media.	The researcher gave a reprimand to the students who did not pay attention to the explanation of the researcher.
2	Some students did not cooperate in completing LKK.	The researcher informs each group to write down the names of uncooperative group members and choose individual work
	Some students have not been able to demonstrate pythagoras material by using geogebra applications.	The researchers explain pythagoras material by using geogebra application in detail

Based on Table IV found some obstacles in the used of GeoGebra application media on Pythagoras material, then the researchers continue on cycle II as an effort to improve it.

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***5.** Description of Learning Result Analysis of Pythagoras Student Material in Cycle II*

In cycle II, 4 meetings were held. Three meetings were held in the learning process and once a meeting was conducted an essay-based learning test. The implementation of learning in cycle I was held at the fifth meeting until the seventh meeting or on August 25, August 27, and August 29, 2016. The eighth meeting was held on September 1, 2016. Each meeting on the implementation of learning was divided into several activities, among others: (1) Explanation of Pythagoras material by using GeoGebra application. (2) Demonstrate material taught by using GeoGebra application media. (3) Working Group Worksheet (LKK). (4) Presenting the results of group work by using GeoGebra application. The result of test result of learning material of Pythagoras in cycle II was presented in Table 5.

Table V. Test Result Data of Student Phytagoras Learning in Cycle II

Statistics	Statistics Value
Subject	20
Ideal Score	100
High Scores	100
Lowest Score	83,08
Score Range	16,93
Average	91,54
StandardDeviation	5,50
Median	93,84

Table V shows that after used the GeoGebra application media, the average test result of the Pythagoras material achievement was 91.54, it indicates that the Pythagoras learning outcomes were in very high category. Furthermore, if the results of the Pythagoras study results were grouped into 5 (five) categories, it would be obtained the distribution and percentage as in Table 6.

Table VI. Frequency Distribution and Test Result Percentage of Understanding Concpet in Cycle II

Score Interval	Category	Frequency	Percentage
85 – 100	Very high	15	75
65 – 84	High	5	25
55 – 64	Medium	0	0
35 – 54	Low	0	0
0 – 34	Very low	0	0
Total		20	100

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Based on Table VI, it shows that the frequency and percentage of learning result of Pythagoras material through GeoGebra application media in cycle I found that there were 15 students or 75% were in very high category and 5 students or 25% were in high category.

6. The Description Analysis of Pythagoras Learning Result in Cycle II

Based on the results analysis, the description of the completeness results of learning Pythagoras students could be seen in Table VII.

Table VII The Frequency Distribution of Pythagoras Learning Result in Cycle II

Score Interval	Categories of Learning Mastery	Frequency	Percentages
0 – 74	Incomplete	0	0
75 – 100	Completed	20	100
Total		20	100

Based on Table VII, it shows that no students were included in the incomplete category and 20 students or 100% were included in the category of Completed. The overall data shows the achievement of classical completeness which exceeds the achievement of the indicator that was 85%.

Based on the results of cycle I and cycle II it can be said that there was an increase in learning results of Pythagoras material through the GeoGebra application media of VIII.4 grade students at SMP Negeri 12 Parepare, this proved in Fig.2.

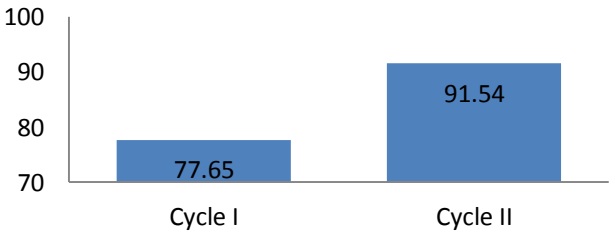

Fig.2. The Comparison of Pythagoras Learning Results Cycle I and Cycle II

Based on Fig.2. above, it shows that the average score of learning result of students' Pythagoras materials increased in cycle I was 77.65 to 91.54 in cycle II.

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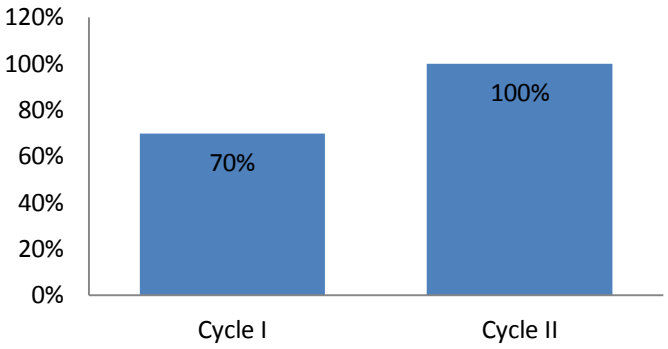

Fig.3. The Comparison of Completion of Learning Results of Pythagoras Students in Cycle I and Cycle II

Based on Fig.3. it shows that students' learning mastery improved on the cycle I by 70% to 100% in cycle II.

7. The Description of Student Activity Observation Analysis in Cycle II

The data analysis of the percentage of student activities observed during the cycle I was presented as in Diagram 4.

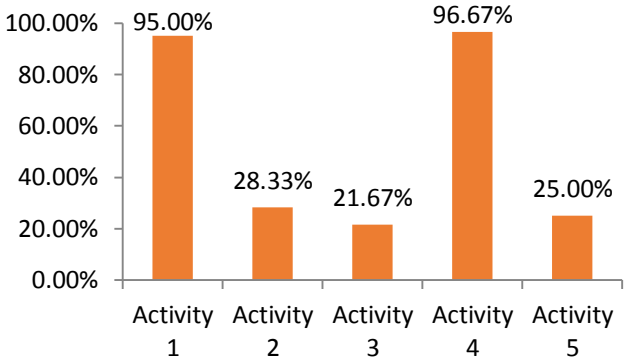

Fig. 4. The Percentage Of Student Activity in cycle 1

Based on Fig. 4. it shows that the percentage of students activity pay attention to the teacher's explanation taught material by using the GeoGebra application that was 95%, the percentage of students given responses or submit an opinion on the explanation of Pythagoras material by using the application GeoGebra was 28.33%, the percentage of students demonstrating the material which was taught by using GeoGebra application that was 21,67%, the percentage of students discuss with their group to solve Pythagoras material problem at LKK was 96,67%, and percentage of student that presented the result

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of group discussion by using GeoGebra plication media that was 25%. The average percentage of student activity in cycle II was 53.33%.

The increase of average percentage of result analysis from cycle I to cycle II was presented in Diagram 5.

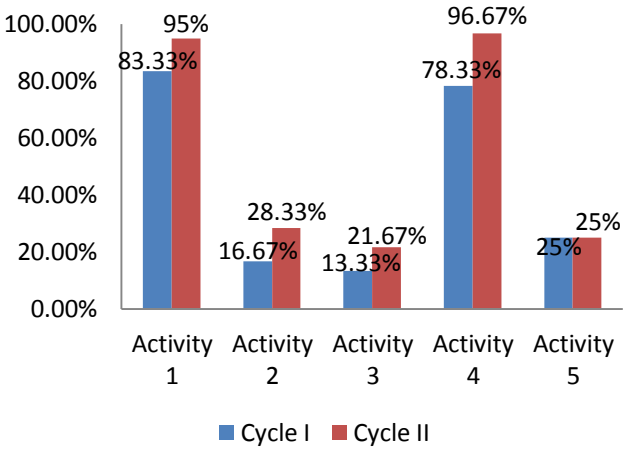

Fig.5. The Comparison of Average Percentage of Student Activity from Cycle I to Cycle II

Furthermore, to know the average increase in student activity shows in Diagram 6.

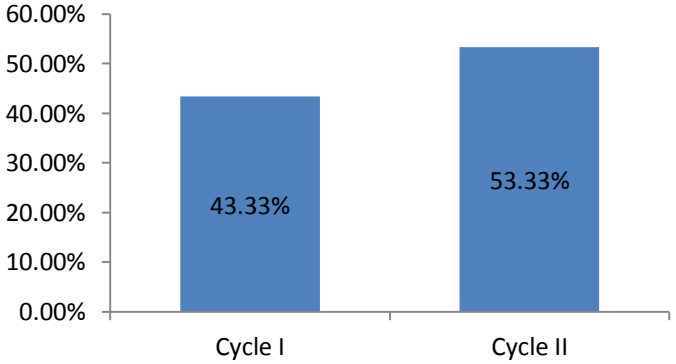

Fig.6. The Average Comparison of Student Activity Percentage from Cycle I to Cycle II

Based on Diagram 6, it shows that the average percentage of student activity has increased was 43.33% in the first cycle to 53.33% in cycle II.

8. *The Description of Pythagoras Material Outcome through Geogebra Application Media.*

GeoGebra application media is a learning medium used to draw up geometry (making sketches of triangle images), making it easier to understand the concept of

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Pythagoras. Learning process by using the application of GeoGebra media was able to attract students' interest in the learning process so that students are more active in the learning process and to solve any given problem related to Pythagoras material.

The use of GeoGebra application media was intended to improve the learning outcomes of students' Pythagoras material. This research was in line with the research of Suyadi [3] which reveals the influence of GeoGebra software on mathematics learning outcomes of junior high school students. Similarly, Wahyuningsih [4] research on the experimentation of the use of GeoGebra in the circle material that provides improved learning outcomes of junior high school students.

This can be seen from the results of research that the average learning outcomes Pythagoras students increased from the cycle I that was 76.75 its the good category and increased in the cycle II where the score was 91.54, its in very good category. The average percentage of student activity also increased from cycle I 43.33% increase in cycle II 53,33%. So it can be concluded that the use of GeoGebra application media could improve the learning outcomes of students Pythagoras material. (2) Increased percentage of completeness of learning result of Pythagoras material of students either individually or classically, (3) Increasing the activity percentage of student during learning process, meaning that the student enthusiastically learns and easy to solve math problems.

9. Constraints of Geogebra Application Media in Learning Process

The achievement of research results that have been obtained, cannot be separated from various obstacles, among others: a. some students did not pay attention to the researchers explaining the material Pythagoras; b. some students have not been able to demonstrate Pythagoras material by using GeoGebra applications; c. some students did not cooperate in completing LKK.

10. Follow Up Research

Learning process by using this GeoGebra application media, it still need to be developed according to the limits of the ability of researchers. Therefore, other researchers may have expected to be:

a. More creative in developing on different materials.

b. Can develop a more interesting GeoGebra application media so that students are motivated in learning math.

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