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Analysis the Effectiveness of Mathematics Learning Using Contextual Learning Model

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Abstract

The purpose of this research was to determine whether learning mathematics using contextual learning model effectively in terms of students' learning mastery, students' learning activities, teacher's ability to manage learning and students' response. Method of research was quasi-experimental. Samples of research were students of grade XI AK¹, consisted of 40 people. The instrument that used in this research was observation, which was used to research students' learning activities, teacher's ability to manage learning, and students' response. The test was used to research the students' learning mastery. The results showed an average of the overall indicator of the effectiveness of learning was increasing from the first meeting of 79.5%, the effective category, being 82.5% in the second meeting, on the effective category and 86.75% in the third meeting, on the effective category, This suggests that learning mathematics using contextual learning model effectively in terms of students' learning mastery, students' learning activities, teacher's ability to manage learning and students' responses.

Keywords: Analysis ; the effectiveness of learning ; contextual learning.

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1. Introduction

Education is the backbone of any nation [1]. In this case, education is a container that will determine the quality of human life in sustaining growth and development of the nation and the state. Education in the context of national development has a function as unifying the nation, the equation opportunities and development potential [2]. Essentially, education is a basic necessity of human beings. Because all people on the earth get education. In fact, education is a responsibility of parents to their children and the state against its people. In other words, education is a conscious effort deliberate, planned, plotted and evaluated given to learners by educators in order to achieve optimal performance. In addition, educators, education experts, designers and stakeholders in higher education and the students all play a role in making the business of education to be successful, meaningful and efficient [3].

School as an educational institution, students will experience learning as a process of educating students who are planned, implemented and evaluated systematically so that students can achieve learning goals effectively and efficiently [4].

According to Gagne [5,6], the study is a set of cognitive processes that change the nature of stimulation from the environment, so that it can change the disposition or the ability of objects to experience it.

In learning, many problems that can hamper the effectiveness of the learning process itself. In analyzing of inhibiting the effectiveness of learning, in fact, many teachers put less appropriate learning model with the submitted materials, especially in mathematics. So that students are less interested in studying mathematics and mathematics itself become a burden for most students. Teaching is indeed to prepare students for the future where they will face situations that require students to think more in giving change [7]. Basically, learning mathematics aims to put mathematics into students thought [8]. This indicates that learning mathematics is beneficial for the students' real world.

Teachers play an active role in the learning and it is certainly a very important position to effective learning. Pedagogic competence and social competence of a teacher must be reliable in the learning process, including specifying the learning model that is appropriate to the material. Because the effectiveness of learning can also be achieved with the suitability of learning with the materials that are taught [1]. A good learning model to be implemented is a model that can improve students' abilities to think or do the activities which is accompanied by a positive response in learning, so that it can create an effective learning. Positive attitudes are evolving raises the comfort level of students, expand their knowledge base, and give them confidence that bigger in their capacity to learn and understand mathematics [9].

Effective has the meaning in effect, influence or effect [10]. In addition it can also be interpreted effectively can bring results, or effective. Effectiveness can be defined level of success that can be achieved from a certain manner or in accordance with certain business objectives to be achieved. Effectiveness in learning is a broader concept to encompass a variety of factors within and outside oneself. Slavin [11] states that:

Learning is effective when it can achieve the desired goals, both in terms of learning objectives and student

achievement is maximized, so that the indicator of the effectiveness of study include:

- a. Achievement of mastery learning.
- b. Achievement of the effectiveness of student activities, namely the achievement of the ideal time that the student to do each of the activities contained in the learning plan.
- c. Achievement of the effectiveness of the teacher's ability to manage learning.
- d. Response to positive learning students.

In a research that conducted by [12] found that the effectiveness of mathematics teaching model *of problem based learning* is more effective than the type of JIGSAW in achieving a high level thinking skills, student attitudes, *self-concept* and students' motivation. Previous research has become one of the references of researcher in conducting this research.

2. Methods

This research aimed to examine or to research the effectiveness of learning mathematics using contextual learning model to students of SMK Harapan Mekar-2 Medan. It was considered from students' learning mastery, students' learning activities, teacher's ability to manage learning and students' responses, method of research was quasi-experimental.

The sample of this research was purposive sampling technique. The research samples were students at grade XI AK¹ consisted of 40 people. The instruments were observation sheet and tests. Observation sheet was used to examine the students' learning activities, teacher's ability to manage learning and students' responses, while the test was used to examine the students' learning mastery. To make the instrument worked optimally, it first had to be validated by one mathematician, 2 mathematics education experts and one university student.

Learning of this research followed the stages in contextual learning model. To obtain research data, the researchers observed the students from the aspects of student activity and students' responses in learning. To facilitate the observation, then each student was given a different number. Then the students were divided into eight groups with each group consisting of 5 students as well as group discussions. In addition, researchers also acted as teacher who were observed by experts to assess the ability of teacher to manage learning. After learning, the researchers gave the test at each meeting to assess students' mathematics learning mastery.

The percentage of the overall indicator was interpreted by the description is qualitative as follows [13]:

Table 1: The qualification of effectiveness learning

Percentage	Qualification
1% - 24%	Not effective
25% - 49%	Less effective
50% - 74%	Quite effective
75% - 100%	Effective

3. Results and Discussion

3.1 Results of the research

The description of the research data of students' learning mastery, observation of students' learning activities, teacher's ability to manage learning and students' responses to learning on the subject of Barisan and Deret Aritmatika/*Arithmetic series and sequences* is as follows:

3.1.1 Description of Research Data Mastery

To determine the effectiveness of learning mathematics with indicators of students' learning mastery, the researchers gave 10 free with a description about a different score. Here is an overview assessment of mathematics learning completeness:

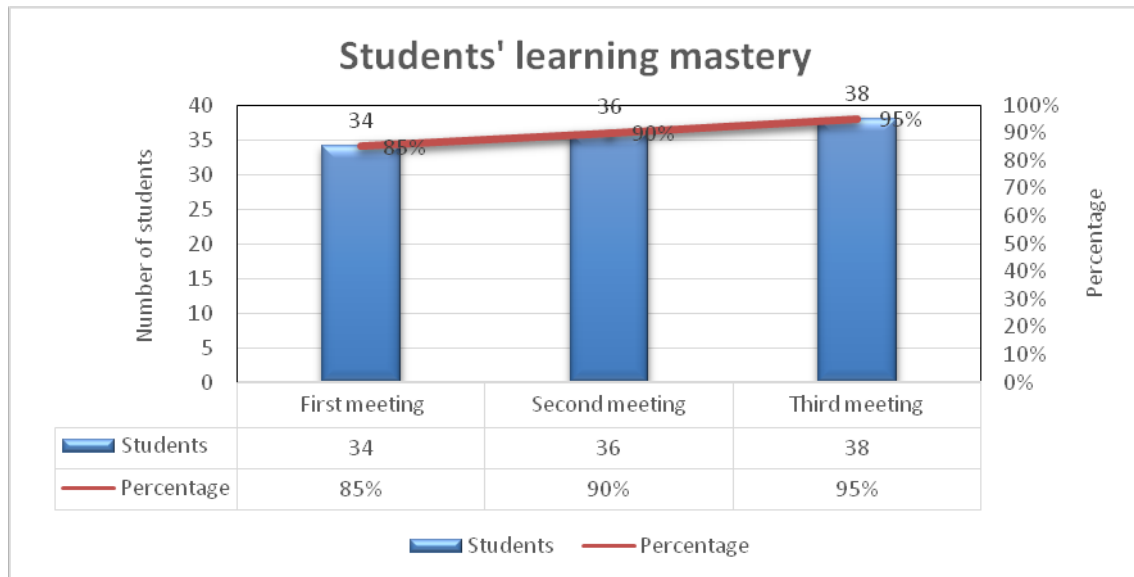


Figure 1: Diagram of students' learning mastery

From the figure above, the number of students who scored at each meeting thoroughly always increased, it can be seen from the first meeting 34 people or 85%, to 36 or 90% in the second meeting, and 38 or 95% in the third meeting. Thus, learning mathematics using contextual learning model effectively in terms of students' learning mastery.

3.1.2 Description of Research Data of Students' Learning Activities

To determine the effectiveness of learning mathematics by indicators of students' learning activities, researchers observed with 12 statements. The description of the assessment result of students' learning activities are as follows:

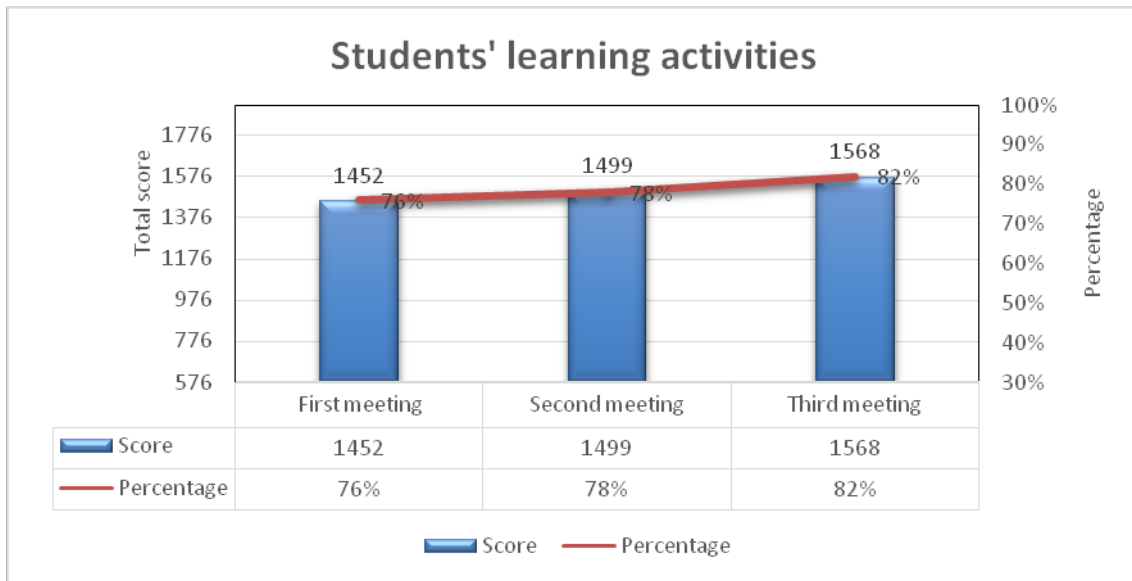


Figure 2: Diagram of students' learning activities

From the figure above, the average percentage of students' learning activities at each meeting was always increasing, from 76% in the first meeting to 78% in the second meeting and 82% in third meeting. So, learning mathematics using contextual learning model was effective in terms of students' learning activities.

3.1.3 Description of Research Data of Teacher's Ability to Manage Learning

In analyzing the effectiveness of learning mathematics with indicators of the ability of teachers to manage learning, researchers acted as a respondent and the teacher was as an observer. The results of the assessment of the teacher's ability from the observer as follows :

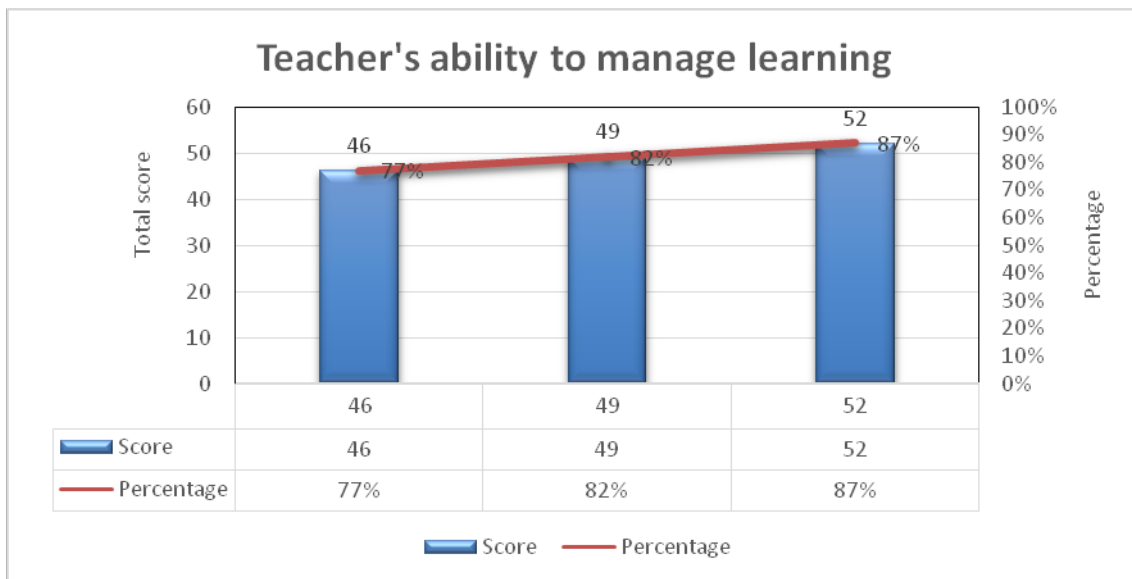


Figure 3: Diagram of teacher's ability to manage learning

Based on the diagram above, score total who was obtained by researchers in the first meeting was 46, with a percentage of 77%, which was in the Good category. In the second meeting, the total score obtained by researchers was 49, with a percentage of 82%, which was in Good category. In the third meeting, the total score obtained by researcher was 52, with a percentage of 87%, which was in the category of Very Good.

3.1.4 Student Response Research Data Description

For indicator of students’ responses, the researchers used the instrument of observation with 10 statements. The description of students’ learning activities result are as follows:

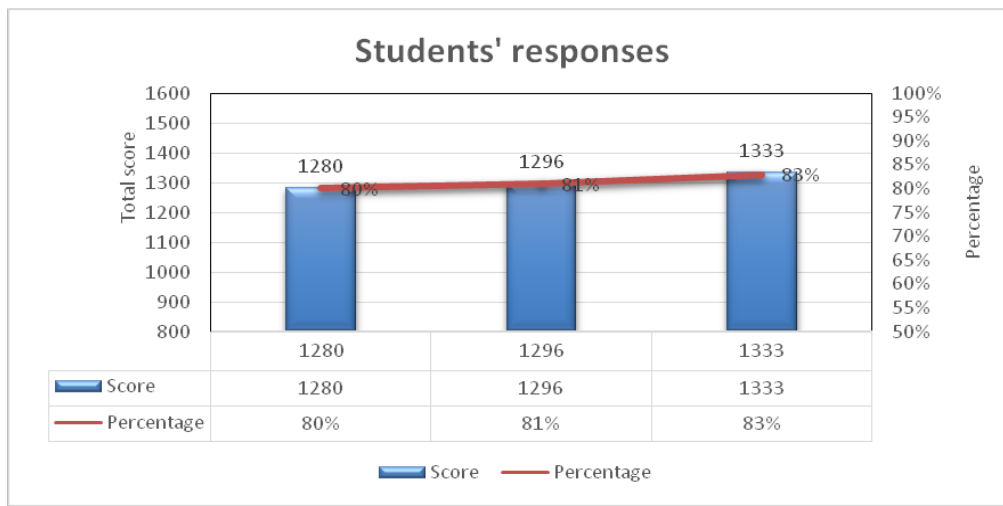


Figure 4: Diagram of students’ responses

Based on the figure above, the average percentage of students’ responses at each meeting always increased, it can be seen from the first meeting by 80% to 81% in the second meeting and 83% in the third meeting. Thus, learning mathematics using contextual learning model effective in terms of students’ responses. From these data showed that there was an increase in students' mastery learning, students’ activity and students’ responses to contextual learning model. Based on the overall details of the above, it can be described as the following results:

Table 2: Results of Research

No	Indicators	Meeting		
		I	II	III
1	Students’ Learning Mastery	85%	90%	95%
2	Students’ Learning Activities	76%	78%	82%
3	Teacher’s Ability to Manage Learning	77%	82%	87%
4	Students’ Responses	80%	81%	83%
	Average	79,5%	82,75%	86,75%
	Description	Effective	Effective	Effective

3.2 Discussion

Based on the results of students' learning mathematics mastery, showed that in the first meeting of the number of scores obtained by the students as a whole was in 2921 with an average of 73.03. from 40 students who studied there were 6 students who did not complete individually, which means that classical learning completeness students by 85%, so that mastery of mathematics learning in the category Completed. While in the second meeting, the number of scores obtained by students overall was 3074 with an average of 76.85. from 40 students who studied there were four students who did not complete individually, which means that classical learning completeness students by 90%, so that mastery of mathematics learning in the category Completed. In the third meeting, the number of scores obtained by students overall was 3506 with an average of 87.65. From 40 students who studied there were two students who did not complete individually, which means that classical learning completeness students by 95%, so that mastery of mathematics learning in the category Completed. Based on observations of students' learning activities, showed that in the first meeting of the number of learning activities of students overall score was 1452, with an average score of 36.3, the percentage of the activity of the classical 76%, so that the activity learning students were on the active category. While in the second meeting, the number of learning activities of students overall score was 1499, with an average score of 37.5, the percentage of the activity of the classical 78%, so that the students' learning activities that were in the active category. In the third meeting, the number of learning activities of students overall score was 1568, with an average score of 39.2, the percentage of the activity of the classical 82%, so that the students' learning activities that were in the active category. From the explanation of it was shown that an increase in the average percentage of students learning activities, from the first meeting of the 76% to 78% in the second meeting and 82% in the third meeting. These results were consistent with studies that have been conducted by [14] which stated that the approach *Contextual Teaching and Learning* using method of *group to group* an effective in terms of students' learning activities towards mathematics. Based on the observation of the teacher's ability to manage learning, showed that in the first meeting of scores obtained number was 47, the average score of 3,067, with a percentage of 77%, so teacher's ability to manage learning was in a good category. While in the second meeting, the number of scores obtained was 49, the average score of 3,267, with a percentage of 82%, so the ability of teacher to manage learning was in a good category. In the third meeting, the total score obtained is 52, the average score of 3.467, with a percentage of 87%, so the ability of teacher to manage learning was in very good category. The ability of teacher to manage classes and the student's behavior is very important to achieve a positive learning outcomes [15]. So with the ability of teachers adequate, it will be easier to achieve the effective math learning. Details of the teacher's ability to manage learning. The table above can be a contributing factor in achieving effective learning. Based on the observation of the students' responses indicated that, in the first meeting overall score students' responses number is 1280, the average score of 32, the percentage of 80%, so that the students' responses in learning were in positive category. While in the second meeting, the number of students' responses overall score was 1296, the average score of 32.4, the percentage of 81%, so that the students' responses in learning were in positive category. In the third meeting, the number of students' responses overall score was 1333, the average score of 33.3 percentage of 83%, so that the students' responses in learning were in positive category. The positive response of students would also be influenced by diverse student cultures [16]. Application of contextual learning support the effective learning that comes from group discussion and

personal stories of students (real context), and it can improve students' memory as well [17]. Thus, the positive responses of the student will be achieved. Research with contextual learning is consistent with Vygotsky's theory of learning that sees cognition following on social development through interaction with others and the environment. Children are learning to live, develop independence and solving problems through personal conversations aloud or silently. Teachers provide a context of interaction, such as group discussion [18].

4. Conclusions and Suggestions

4.1 Conclusions

Based on the details of the results in the table above shows that in the first meeting of the effectiveness of the learning percentage of 79.5% and it was in effective category. In the second meeting increased to 82.75%, it was also in effective category. And in the third meeting of 86.75% was also in the effective category. So overall it can be concluded that learning mathematics using contextual learning model to students of SMK Harapan Mekar-2 Medan was effective if it was considered from students' learning mastery, Students' learning activities, and teachers' ability to manage learning and students' responses.

4.2 Suggestion

Mathematics learning in schools should be able to use contextual learning models that have proven to be effective. For the next researcher, to examine more broadly contextual learning models viewed from different perspectives.

5. Limitations

The constraints in this study are the limited facilities and infrastructure of the school where research that supports contextual learning model, so researchers should prepare as much media to support learning in the classroom.

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