



The Implementation of Demonstration Method to Increase Students' Ability in Operating Multiple Numbers by using Concrete Object

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Abstract

The purpose of this action research is to increase the students' ability in learning mathematics, in order to increase the quality of learning activities in learning mathematics activities. This study was conducted in three phases, namely the pre cycle, the first cycle and second cycle. After seeing the learning process through observation and reflection on the first cycle, the students' outcomes in learning at the second cycle was increased to 72.5 with the completion percentage value is 86.67%.

Keywords: Students' Ability; Demonstration Method; Media of Concrete Objects.

1. Introduction

Learning is the main activity of all activities in school. School is an institution that is authorized to provide educational services and learning resources for learners to gain knowledge which is covered all competencies in each subject. In accordance with Dimiyati and Mudjiono's opinions [1] "learning is a programmable teacher activity in instructional design, to make learning active, emphasizing the provision of learning resources".

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In accordance with the demands of effective learning, the learning process in the educational unit is held interactively, inspiration, fun, challenging, motivate learners to participate actively, and provide enough space for initiative, creativity, independence with talent, interest and the physical and psychological development of learners (PP No. 32 of 2013) [2].

Generally, demonstration method is a method of providing lessons by exhibiting and demonstrating. The demonstration method is a method of teaching by demonstrating things, events, rules, and sequences of activities, either directly or through using instructional media which is relevant to the subject matter or material that will be presented [3]. The purpose of teaching using a demonstration method is to show the process of occurrence of an event according to the teaching materials, how they are attained and the ease to be understood by the students in teaching learning process. The demonstration method has several advantages and disadvantages.

The results of the previous study [4] found the comparison of the relative effects of laboratory methods with a direct demonstration of the declarative knowledge (factual and conceptual) and procedural knowledge (problem solving). Student reasoning ability and prior knowledge of science were assessed before doing instruction. Both methods of learning produce the same achievement of declarative knowledge. However, the students in the laboratory class which tested procedural knowledge directly is better than the students in the class which taught by demonstration. This result is not related with reasoning ability.

Similarly with that study [5] who studied the effect of demonstration methods, the students' achievement in agricultural science in secondary schools of East Kogi Education Zone. The results showed that the demonstration method had a significant effect on students' achievement rather than taught by conventional lecture method. This is useful as recommendations, such as: the effort that teachers must make to integrate thoroughly the methods of demonstration in the teaching of agricultural science in high school, the efforts must be intensified by teachers to implement demonstration method aggressively in teaching agricultural science in all classes offered at the high school level.

Understanding and mastering mathematical concepts, of course must be with attention to the age and experience that may be owned by students. In accordance with the quotation in textbooks [6] thus, Bloom's Taxonomy is a hierarchical structure that identifies *skills* ranging from low to high level. Of course, to achieve a higher goal, a low level must be met at the first time. Within the framework of this concept, the purpose of this study by Bloom is divided into three domains of intellectual abilities (*intellectual behaviors*), namely cognitive, affective and psychomotor.

The existence of curriculum demands resulted in math lessons still focused on theory so that students become less creative. One of the subjects that need more attention is mathematics. Mathematics is one of the most difficult subjects and become a scourge for students, thus affecting the low achievement of students' ability in learning mathematics. Multiplication operation is one of the math lessons in the fourth grade of elementary school which at this stage the child is thinking as operational concretely, where the fourth grade students have been able to calculate abstract without needing to use picture, but the fourth grade students are still transition

from low grade. Therefore, this research should also use concrete objects to give better understanding and explanation about the concept of multiplication operations.

Based on the observations in MIS Ad-Dakwah Kabanjahe, especially in grade four obtained the conclusion that the students tend to have difficulty in doing the exercise because of their lack in understanding mathematical concepts. They are also not accustomed to present the result of their exercise in front of the class. This causes they don't like math subjects and they are lazy to learn about math. The students are more passive and never learn to solve problems in math so they can only reveal what they receive from the teacher.

Most of them considered that the subject of mathematics as a scary specter, so it needs a relevant learning to stimulate students to be motivated and more creative in learning mathematics. As well as learning by applying demonstration method through using concrete objects as media. In this study, the students are required to be more active and creative in solving math problems, especially in implementing math concepts on the matter of multiple operations.

The ability of conceptual understanding is a part of the ability in high-level of mathematical thinking. In order, to increase the students' ability in mathematical thinking of high-level they are must be motivated, then the learning process must be an environment where the students can be directly involved actively and creatively in many useful mathematical activities. Teachers are required to provide opportunities for students to construct their own knowledge learned through activities, including through the activities of solving mathematical problems through the implementation of these concepts. In the process of learning activities, the students are not enough just listening and recording as commonly found in schools nowadays, but the activities should produce changes in attitudes or behavior of the students in the learning process. Learning activities includes physical and mental activities.

In addition to the student activity, in learning mathematics the prior knowledge (early ability) of students also affect the successful of students in learning. Since mathematical material is generally hierarchically arranged, one material is a prerequisite for subsequent material. If students do not master the prerequisite material (initial knowledge) then the students will have difficulty in mastering material that requires the prerequisite material.

The student's early ability is the student's learning achievement on the previous material, so that in one class of students can be grouped into three groups based on the their ability: upper, middle and lower groups. Thus, the students with prior ability in the upper group have no difficulty in understanding the existing material and solving mathematical problems, when compared with students who have prior skills in other groups (middle and lower).

These conditions will be minimized if the learning method used can encourage students from the upper, middle and lower groups to learn more actively in mastering the material given thus it is hoped that the students can solve math problems properly and can be realized. The higher activities of the students in relation to a material, is expected to enhance the level of the students in mastering math concepts and to solve the problem of each problem proposed.

The successful of learning is marked by the students' ability in mastering multiplication operations. The degree of mastery of students to the matter of operation of the multiplication of numbers is usually expressed by value. By looking at the results of mathematical repetition on the matter of multiplication operations of numbers, there are still many students who have not mastered the matter of number multiplication operations. From 30 students in grade IV only 17 students mastering the material or achieving learning goal for the operation of multiplication numbers with an average value is 63.9 or 56.67%.

Therefore, to increase the students' ability in mastering multiplication operation matter, the researchers would like to conduct a research in fourth grade of MIS Ad-Dakwah Kabanjahe by carrying out Classroom Action Research (CAR) and implementing demonstration method through using concrete object as media to increase the students' ability in multiplication operations matter. William James (2007) states that Classroom Action Research is a study conducted by teachers in their own classes with the aim of improving performance for student learning outcomes to increase along with observers and peers.

2. Research method

This research was conducted in MIS Ad-Dakwah Kabanjahe and the subject of research is the fourth grader which consisted of 30 students, 14 male students and 16 female students. Generally, the characteristics of elementary students are active in the classroom, playful, active, and happy to feel or do something directly. So the sampling is done randomly. Investigated factor was the students learning activities in mathematics learning process in operations number material, teacher's skill in teaching mathematics, and students' learning outcomes. The measurement is based on the score of the students' ability to comprehend the concept of mathematics, learning observation sheets and observation sheets on the student activities. This research was conducted in 4 stages, first phase is planning, second is implementation or action of implementation. The next phase is observation and interpretation through observation of the students' level during the learning process in the classroom. The last phase is analysis and reflection. At this stage carried out activities to analyze and process data obtained from the results of research. Method of collecting data in this research was test, observation and documentation. The instruments were used to increase the learning process are: (1) Plan of improvement in learning at Cycle I and Cycle II, (2) Cycle I and Cycle II observation sheets, (3) Student worksheets, and (4) Formative test sheet.

3. Result of the research

Table 1: Score of students' achievement in understanding concept matter

Minimum Mastery Criteria	Average Value and Percentage Value		
	Pre Cycles	Cycle I	Cycle II
70	63.9 (56.67%)	68.4 (76.67%)	72.5 (86.67%)

Based on the data of the research that has been done, the average score of the students' achievement score of the ability to comprehend the math concept of each individual in Cycle I is 68.4 with the percentage of the total value is 76.67%. It shows that the students' understanding of mathematical concepts has increased from 63.9 in the Pre Cycle with the percentage is 56,67%. Learning outcomes have not been able to achieve to the optimal completeness of the minimum mastery criteria is set at 70. After improving the learning process through observation activities and reflection on the first cycle, the results of student learning on the second cycle has increased the average achievement of the students' ability in mastering math concept, test scores reached 72,5 with the percentage of 86,67%. It can be described in the diagram below.

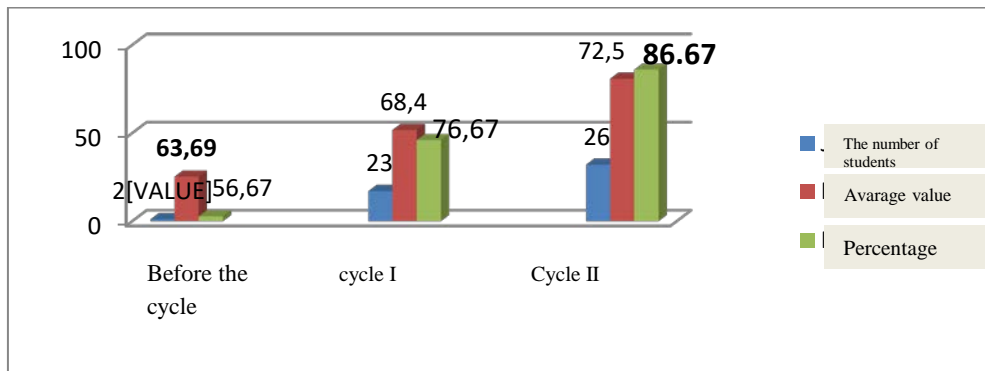


Figure 1: Achievement Diagram of Learning Outcomes Before and After Cycle

4. Discussion

From the results of the study, it can be seen that the results of students learning in mathematics with demonstration methods through concrete objects experienced it increased of students' outcome in learning activities at Pre Cycle, Cycle I and Cycle II on the matter of number operations.

A student can be categorized have succeeded or completed the matter of multiplication operations if the result of learning has reached the minimum criterion that has been determined. Through the learning of demonstration methods with concrete objects as media, the students can develop their skills that they have, because in learning process the students are required to play actively in group discussions and creatively find solutions to the problems posed, interact with friends and teachers and exchange ideas so that their insights and thinking power will expand. This will help students a lot o increase understanding their ability in mastering mathematical concepts so that when they are faced with a question that demands a solution, they can do problem-solving skills and develop their responses based on concepts that have been understood and mastering not only by memorizing without enrich and expand their critical thinking.

In accordance with the results of the study [7] conceptual and procedural knowledge evolve iteratively and the problem of representation is one of mechanism that is underlying the association between them, prior conceptual knowledge of children predict gains in procedural knowledge and procedural knowledge advantage in expecting an increase of conceptual knowledge. The correct representation of problems mediates the relationship between prior conceptual knowledge and better procedural knowledge. So with the correct procedural as the provision of

materials with methods and good media will improve students' understanding.

In learning process, demonstration methods with concrete objects media, students do not only listen and receive passively the information transferred by the teacher, but the students also play an active role in digging the required information. Student activities that arise during the learning process contribute positively to the increased ability to understand students' concepts that ultimately also improve their learning outcomes.

On the other hand, demonstration method and concrete object that used by the teacher during learning process can increase the students' activeness and assist students in understanding material, it can be seen from the result of the observation sheet which indicating that most of students are happy with the learning process because it can train them to cooperate and be brave to express their opinions. Positive responses and interests of students to the overall learning process will help many students in increase the learning outcomes.

5. Conclusion

Based on the theoretical framework, analysis and referring to the formulation of the problems described in the previous part, it can be concluded that the increase of learning by implementing demonstration methods through concrete objects media can increase the students' outcomes in the ability of mastering mathematical concepts on the matter of multiplication operations.

6. Suggestion

There some suggestions that can be provided on this study, they are as follows:

1. It is expected that teachers could use demonstration method in teaching to ease the students in mastering the lesson so they could increase their ability, especially in matter of operations number by using concrete object as media.
2. It is expected that teachers will continue this research to obtain more comprehensive and useful results as a counterweight to theory as well as reform and innovation for the educational world especially the use of method or learning model that can engage students in learning actively.

7. Limitations of Research

The limitation of this research is only done in one school only. So this research only involves a limited number of subjects. The subject was 37 students in one class. So the results can't be generalized to groups of subjects with large numbers.

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