



Improving the Learning Outcomes of Students using Numbered Heads Together Model in the Subjects of Mathematics

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Abstract

This study aims to improve the learning outcomes of students on subjects of mathematics in the subject matter of planar structures by using the *Numbered Heads Together* (NHT) model in class V of Public Primary School 026609 of South Binjai. The present study is a classroom action research (CAR). Subjects in this study were students in class V of Public Primary School 026609 of Binjai Selatan, as many as 1 class consisting of 35 students. Implementation of the action is done in 2 cycles where in each cycle there are two sessions, so as a whole 4 times session is held. Each cycle consists of 4 stages, namely Planning, Implementation, Observation and Reflection. In cycle I there are 20 students who have completed with the percentage of 57.14%, and 15 students who have not completed with the percentage of 42.86%, where the average of the class is 65.43. Based on the success rate of classically the learning and teaching process is still classified as unsuccessful. Therefore, the study is continued to post-test in cycle II. In cycle II there are 32 students who have completed in learning with percentage of 91.43% and there are 3 students who have not completed in learning with percentage of 8.57%.

Keywords: Learning Outcomes; Mathematics; *Numbered Heads Together* Model.

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1. Introduction

The quality of education at the level of Primary School is still far from what we expect, especially with regard to the quality of learning. Education can not be separated from learning. By learning, everyone will experience change and can develop better than other creatures, and can sustain his life in the development of an increasingly advanced era and increasingly fierce competition as it is today. The main indicators used to assess the quality of learning and graduation of students from an educational institution are often based on the learning outcomes of the students listed on the scores of learning outcomes.

From the observations made on the learning of Mathematics in class V of Public Primary School 026609 of South Binjai, it is known that the interest of students is still low on the subjects of mathematics and this appears at the time students are following the lesson. As soon as the material is presented to the students, the teacher assigns the students to work on the problems contained in their textbooks. The subjects of mathematics in school are often considered difficult and boring for students. This can be seen from the value of the evaluation of subjects of mathematics are still low.

Reference [11] suggests that cooperative learning is a learning process in which students work on tasks together to help each other in one group. Then [16] says that cooperative learning is helpful to improve the cognitive and affective abilities of students.

The learning model of Numbered Heads Together is expected to be an alternative for use in the classroom. This model allows students to work with their groups, answer questions from teachers, make sure each group member can determine and find solutions to questions, answer questions provided by teachers, and make sure each group member can work on and know the answers to those questions. In this learning model, students are invited to be like playing in answering questions, because each group is assigned a number that has been determined by the teacher when the teacher asks questions, then each group discusses the correct answer. The student whose number is called then reports the results of the group discussion. Students from other groups can respond, and the teacher designates another number, thereby motivating students to learn and improve learning outcomes of students in subjects of Mathematics.

Learning is a change of behavior or appearance by a series of activities, for example, by reading, observing, listening, and imitating. People who did not know would know after learning [9]. Then according to [1] learning is a process of efforts undertaken by a person to obtain a change in behavior that becomes new as a whole, as a result of his own experience in interaction with his environment.

Based on the opinions on the definition of learning cited above, the researcher assumes that learning is the effort of a person who is made consciously and produces a change within himself. It is achieved as a result of his own experience in interacting with his environment. And the results of learning in a person is characterized by a change in behavior to a better direction.

Learning outcomes are a change in the behavior of students as a result of learning [7]. Meanwhile Sudjana [12] suggests that "learning outcomes are the abilities that a student possesses after he / she receives his / her learning

experience". Reference [12] Learning outcomes can also be patterns of deeds, values, meanings, attitudes of appreciation and skills, as expressed in a thought."

Based on some opinions about the learning outcomes described above, the researcher can conclude that learning outcomes are the abilities that a child acquires through learning activities. And basically the result of learning is formed from the interaction of various factors that affect the learning process as a whole. Mathematics is the science that underlies the development of modern technology is playing an important role in other disciplines as well as in everyday human life. The development of mathematics education is dynamic and requires the right attitude according to its development. One of the new innovations in the emerging education services system and demanding adaptation in mathematics education is inclusive education [1]. Mathematics is the study of patterns and relationships, a path or pattern of thinking, an art, a language and a tool [8]. Learning Model of Numbered Heads Together is one type of cooperative learning that encourages students to actively and mutually cooperate in learning materials to improve their low learning outcomes and improve student activeness as learning takes place. Numbered Heads Together is a series of delivery of materials by using groups as a container in unifying students' perceptions / thoughts on questions asked or asked by teachers. Then the perception / thought will be accounted by the students in accordance with the number of requests by teachers from each group [4]. Reference [3] "Numbered Heads Together is to provide opportunities for students to share ideas and consider the most appropriate answers and improve the spirit of student cooperation". Then [13] says that "Numbered Heads Together is a type of cooperative learning designed to influence the interaction patterns of students and as an alternative to traditional classroom structures". Reference [9] NHT indirectly trains students to share information, listen carefully, and speak with consideration so that students become more productive in learning. The learning strategy of Numbered Heads Together gives priority to group work rather than individual work, so students work in an atmosphere of mutual support and have many opportunities to distribute information and improve communication skills. Based on the above opinion, it can be concluded that the learning model of Numbered Heads Together is a model of learning with numbered games, where learning refers to various models of teaching and students working together in mastering the subject matter in the group.

2. Research Method

The present study is a classroom action research using the Numbered Heads Together model as the main target. This research attempts to describe the use of Numbered Heads Together model as an effort to improve the learning outcomes of Mathematics in class V of Public Primary School 026609 of Binjai Selatan. The subject in this Classroom Action Research is the fifth-grade students of 35 which consists of 22 male students and 13 female students. The object of this research is the action to improve learning outcomes of students on learning of mathematics with Numbered Heads Together model. The procedure of this study has several stages of implementation of actions that are outlined in 2 cycles. In cycle I the learning requirements are presented in 2 sessions, and cycle II only consists of 1 session. The results of cycle I are used as a reference in determining the improvement of action in cycle II. While the results of cycle II will be used as a reference for follow-up plan of further learning. Stages in this research procedure are (1) Planning (2) Implementation of action (3) Observation (4) Reflection.

Cycle I

2.1 Planning

At this stage of the planning, the researcher consults with the classroom teacher about the implementation of classroom action research that will be conducted by the researcher, so that the teacher can cooperate with the researcher in conducting this research. At this stage the activities undertaken are:

- a. Develop a plan of implementation of learning for each session.
- b. Preparing materials and media of learning
- c. Prepare numbered cards provided by the teacher
- d. Designing the division of learning groups
- e. Teachers prepare problems that will be given to students based on the competence of students to be studied
- f. Prepare an observation sheet that will be used to determine student development during learning and teaching activities.

2.2 Implementation

Activities undertaken at this stage is to implement learning in accordance with the scenario of action that has been prepared. Activities undertaken at this stage include:

- a. Teacher conveys the purpose of learning to be achieved to the students.
- b. The teacher presents the material according to the competence to be achieved.
- c. The teacher divides the students into groups of 3-5 and groups are assigned numbers 1 through 5.
- d. The teacher gives the problem and each group does it.
- e. Students unite their opinions on the answer to the question and make sure each member knows the answer.
- f. The teacher calls one of the numbers, the student with the number called will report the results of the cooperation of their group.
- g. Other groups were given the opportunity to respond to answers from group who had presented the results of the discussion.
- h. Summing up teaching materials together with students.
- i. Distribute the question sheets to the students to measure the extent to which the learning outcomes are achieved by the students.

2.3 Observation

Observations were made to observe the activities of the students during the learning activities took place. This observation aims to determine the suitability of actions that can produce changes as desired. After the implementation of the action, the test is conducted to see how successful the implementation of the learning model is.

2.4 Reflection

Reflection activities are carried out to consider the teaching guidelines undertaken, as well as to see the suitability achieved with the desired in the learning. The results of the action and observation steps are collected and then analyzed to see the deficiencies. The results of this reflection are then used for improvement in the next cycle.

Cycle II

2.4.1 Planning

Based on the evaluation and reflection result from cycle I, the researcher will carry out cycle II by improving the things that happen in cycle I.

The improvements made in cycle II are as follows:

- a. Develop a plan of implementation of learning for each session.
- b. Prepare the paper to be used as a place to write questions and answers.
- c. Prepare teaching materials that will be taught, namely the development of communication and transportation technologies.
- d. Develop learning scenarios in accordance with the model used and the questions of test that will be given to each student based on the competencies studied.
- e. The researcher set up indicators to measure learning outcomes.
- f. Prepare an observation sheet that will be used to determine the progress of the student during the learning and teaching activities.

2.4.2 Implementation

At this stage the activities undertaken are:

- a. Teacher conveys the purpose of learning to be achieved to the students.
- b. The teacher presents the material to the students according to the competence to be achieved.
- c. The teacher explains to the students how the learning steps by Headed Together model will be implemented in the learning and teaching activities.
- d. The teacher divides the students into groups of 3-5 and groups are assigned numbers 1 through 5.
- e. The teacher gives the problem and each group does it.
- f. Students unite their opinions on the answer to the question and make sure each member knows the answer.
- g. The teacher calls one of the numbers, the student with the number called will report the results of the cooperation of their group.
- h. Other groups were given the opportunity to respond to answers from group who had presented the results of the discussion.

- i. Summing up teaching materials together with students.
- j. Distribute the question sheets to the students to measure the extent to which the learning outcomes are achieved by the students.

2.4.3 Observation

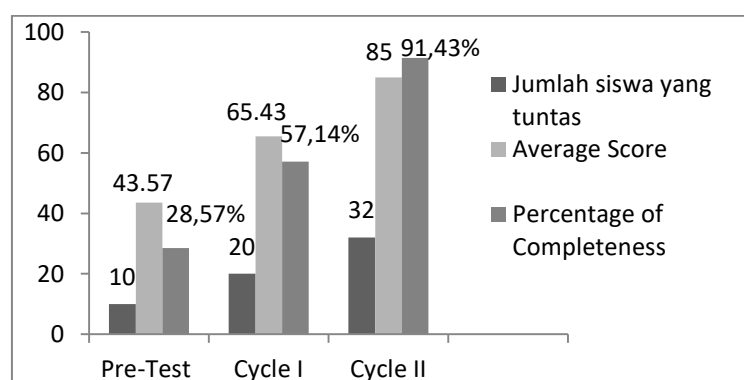
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2.4.4 Reflection

Reflection activities are carried out for the conclusion of all learning outcomes of students during the learning process takes place. If in the stages of cycle I still found students who get low learning results then the next cycle should be implemented. However, if the desired goal is met then there is no need to take action on the next cycle, in other words learning has been considered complete.

3. Results Of Result

Based on the data on the results of research, from 35 students of class V there are 10 students who stated have completed and the remaining 25 have not completed in pretest with an average value of 43.29. Then in the test of cycle 2, there are 20 students have completed and the remaining 15 are said to have not completed with an average score of 65.43. In the test of cycle 2, as many as 32 students that have completed and 3 students that have not completed with an average value of 85. The success rate of learning achieved by using the Numbered Heads Together model can be illustrated as the following graph:



Graph 1: Percentage of Classically Completeness of Learning Outcomes of Students

In the graph above we can see how the learning outcomes of students classically based on the average score of the class and based on percentage (%), starting from the pre-test, cycle I to increase in cycle II. Of the 35 students of class V, the completeness of the learning outcomes of students classically in pre-test is 28.57%, it

increases in the first cycle to 57.14% and in cycle II increases further to 91.43%.

4. Discussion

The journal that can be used as discussion material is entitled "The Use of Cooperative Learning by Numbered Heads Together Model to Improve Learning of Subjects of Mathematics in Students" written by Nasrun [5]. Mathematics is very important for primary school students' education as it is necessary to find a solution, that is how to manage the learning and teaching process of mathematics in primary schools, so that mathematics can be understood by students. In an effort to manage the process of learning mathematics in elementary school a certain strategy is needed which one of them is cooperative learning. Some experts claim that this model is very useful to cultivate skills of cooperation, critical thinking, and willingness to help friends and so on. Based on data obtained from previous journals in cycle I is that 68.3% or 28 out of 45 children included in the complete category and 31.7% or 17 of 45 children included in the incomplete category. That means there are 13 students who need to be remedial because they do not reach individual mastery. Evaluation activities of students should not only be cognitive. There is a section that needs to be revised that is in addition to seeing a cognitive improvement, researchers should also observe the affective and psychomotor abilities of students. The results of this study are in line with a journal written by La Suha Ishabu [15], which states that the use of cooperative learning model of Numbered Heads Together (NHT) can improve the learning outcomes of students.

Bell [2] argues that each theory can be viewed as a method for organizing and studying the various of variables related to learning, and intellectual development, and thus the teacher can select and apply certain elements of theory in the implementation of classroom teaching. The result of cognitive development is thinking. Smart minds are created from the experience of "generic coding systems that allow one to surpass data for new predictions and may be useful" Bruner [14]. Mathematical learning is more about cognitive learning theory, which emphasizes the individual to think.

5. Limitations

The limitation of this study is:

- The study was limited in one elementary school by involving students in class V
- The study only on the material flat wake and still be developed in other materials in accordance with the use of model *Numbered Heads Together*

6. Conclusions

The learning model of Numbered Heads Together is used to improve the learning outcomes of students by performing 2 test cycles, each of which has four stages of planning, implementation, observation and reflection. Through the data obtained can be interpreted that by using the Numbered Heads Together model the learning outcomes of students can be improved in the subject of planar structures in class V. Based on result of data analysis, result of student learning on cognitive aspect in cycle 1 there are 15 students or 57,14% that have score of completed, and on cognitive aspect in cycle II level of classically completeness is achieved because as many

as 32 students or 91,43% have score of completed. While on the affective and psychomotor aspects, students experienced an increase with an average value of 79.86 that belong to category of good.

7. Suggestions

Teachers should use appropriate learning models and instructional media in accordance with the material being taught. By using the right model of learning, students are expected to be more active in the learning process and teachers can also use the Numbered Heads Together model in order to improve students' learning outcomes for the better.

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