



The Effect of Numbered Heads Together (NHT) Cooperative Learning Model Assisted by Audio Visual Media on Learning Outcomes of Elementary School Students

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Abstract: This study aims to analyze the effect of the learning model cooperative type Numbered Heads Together (NHT) on the mathematics learning outcomes of elementary school students. This study used a quantitative approach and method Quasi Experiment with Posttest Only Control. The research instrument used a test while the data analysis technique uses a hypothesis test with the t test formula. The results of this study proved that the type cooperative learning model Numbered Heads Together (NHT) affects mathematics learning outcomes by being proven by hypothesis testing using the t test as follows. Based on the provisions of $t\text{-count} > t\text{-table}$ with together, results $t\text{-count}$ 13,718 and $t\text{-table}$ 1,999 so that the the results of this study explained the significant influence on student learning outcomes. The effect of using the cooperative learning type Numbered Heads Together (NHT) is that students are more active in asking questions when the teacher is explaining or discussing as well as increasing student interaction in the classroom and learning is not teacher centered. Teacher can use this learning model to increase students' enthusiasm so that student learning outcomes increase.

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Introduction

Education is the most important thing for improving human resources. National Law no.20 of 2003 states that the learning process is carried out by students and teachers in the school environment. Article 3 stated that the function of national education is to form and improve the nation's capabilities and civilization to educate the nation's life the develop potential of students to create intelligent, creative, innovative and responsible human beings (Noor, 2018). Generally, education is a learning process to produce changes in students who are able to compete in their environment along with the development of the times. Ernest R. Hilgard in (Setiawati, 2018) suggests that learning is an individual process so that permanent changes in behavior occur both inside and outside the classroom. Learning Outcomes, namely the success of students in learning at school obtained after taking the usual tests expressed by a score (Ahmad Susanto, 2015). Learning outcomes included the ability of knowledge, attitudes, and skills (Suprijono, 2012).

Mathematics is a compulsory subject at every level of education, from elementary school to college. Mathematics lessons at elementary school (SD) are the beginning of learning concepts to continue to the next level. Remove Marti in (Rostina



Sundayana, 2014) argued that mathematics was an essential science to learn because it was a means to solve problems about counting and measuring that arise in life. According to the Ministry of National Education in (Ahmad Susanto, 2015) Learning mathematics in elementary schools aimed to have skills, reason, think critically in the application of mathematics to solve problems in life.

However, in reality, learning mathematics is not easy. Mathematics is always considered a complex subject to understand because it is often difficult to convey or accept. Based on the results of interviews and observations at SDN Srengseng Sawah 04 Pagi there were problems in mathematics, especially in the subject of angles, namely: (1) The process of learning mathematics still tends to be monotonous, students listen and the teacher explains. (2) Lack of exercises - exercises to solve math problems, so that students' mathematics learning outcomes are low. (3) Students are not active in the mathematics learning process, so they are afraid to express opinions and ask questions. Judging from the scores of students, there are still many who are less than the minimum limit or the criteria for the provision of mathematics lessons, which is 70. The highest score is 100 and the lowest value is 25. It can be seen that of the 32 students, 13 students who managed to pass the minimum score of 70 still less than the minimum score of 19 people.

Based on the problems above, the teacher plays an important role in realizing interesting and fun mathematics learning so that students feel like and love mathematics. The way to create the learning concept, the teacher plays a role in the selection of learning models that are creative, innovative, interesting, communicative and appropriate to be applied in the classroom to obtain good results. Learning model cooperative type Numbered Heads Together (NHT) is considered suitable in maximizing learning in schools so that learning objectives are achieved (Bayana & Surachman, 2020). According to Joyce and Weil in (Trianto, 2015) the learning model was a way for teachers to help students get information and skills in the learning process. Slavin in (Muhammad Fathurrohma, 2015) argued that the cooperative learning model is a model that seeks to work together to achieve common goals. Characteristics or characteristics of learning cooperative is (Rusman, 2014); (a) Study in groups, (b) Based on the conditions of the cooperative model, (c) Help each other work together, (d) Accustomed to working together.

Type Numbered Heads Together (NHT) was a model that emphasizes students to be able to pursue, manage and deliver material obtained by presenting it in front of the class (Kusumawati, 2017). Therefore, the application of the learning cooperative type Numbered Heads Together (NHT) students could be active and establish cooperation between students so that they understood what was being studied and will get good results (Panuah, 2019). Aris Shoimin (in Abarca, 2021) suggested the advantages and disadvantages of the learning cooperative type Numbered Heads Together (NHT) as follows: The advantages of the learning Numbered Heads Together (NHT) that is in the process students learn through group discussions, interact with each other, share information and each student has the opportunity to report the results of their discussions. While the difficulty of the learning Numbered Heads Together (NHT) that is, if applied to a large number of students, it can take a long time and only students who are called upon have the opportunity to report the results of their discussions.

In addition to applying the learning cooperative type Numbered Heads Together (NHT) in mathematics, can be helped by using learning media. According to Gerlach and



Ely in (Cecep Kustandi, 2011) suggest that all forms that can inform messages can be called media. Audiovisual is a medium for distributing messages using sight and hearing senses. Various kinds of audio visual media are television, video, VCD, film, and sound slide. The functions of Audio Visual media are: (1) Students can clearly receive the message because it can not only be seen but also heard. (2) There is no limitation of space, time, and senses. (3) Learning media could make students interested and active (Yuanta, 2020).

From several types of media Audio visual taken one that is video media. Video media are widely used ranging from entertainment to education. Video media can display the state of events as in their original state (Wicaksana et al., 2017). This study used video media, namely animated videos. According to Faris in (Ponza et al., 2018) Animated media are images that can display movable visuals and audio. This study aims to analyze the effect of the learning cooperative type Numbered Heads Together (NHT) on the mathematics learning outcomes of elementary school students. Based on the above problems and the low student learning outcomes due to conventional learning models, teachers need to create more creative and active learning models for students, therefore it is important to research on learning models to improve elementary school students' mathematics learning outcomes.

Research Method

This study used a quantitative method with a model *quasi experiment* in the form of post-test only control design by making the two classes as an experimental class and a control class. (Andhini, 2017) Quantitative research is based on facts in the search for information in research (Hardani et al., 2020). Sampling technique using *non-probability* sampling by not making all populations have an equal chance of being sampled. (Sugiyono, 2013). The instrument of this study used a test. According to Sugiyono in (Riduwan, 2020). Validity test was a measurement made by looking at the accuracy of an instrument that was measured to students, the results could be valid and drop if they had accuracy with applicable provisions. The formula used is correlation Biserial Point; this formula is used for nominal variables with ratio/interval dichotomy or multiple choice (Budiwanto, 2017). Questions that have been said to be valid will be tested for accuracy through the formula KR-20 (Riduwan, 2020).

The data analysis technique used the normality test to find out whether the data from a sample was normal or not, using the test formula *liliefors*, then homogeneity test to see homogeneous data from a data using the test formula *fisher* (Kusdiwelirawan, 2017). Finally, a hypothesis test was conducted to see the final results of this study using the t-test formula (Budiwanto, 2017).

Results and Discussion

The results of this study were in the form of data descriptions, and data analysis. The instrument used in this study was a test. The test is used to get students' Mathematics learning outcomes. The implementation of this research consists of three stages, (1) the preparation stage, the researcher conducts interviews with the school, prepares lesson plans, prepares research instruments that will be used in research (posttest), gives test questions to the research sample. (2) The implementation phase of the research is giving treatment to the experimental class in the form of a learning model, giving treatment to the control class, the research is carried out for 4 days, at



the end of the study giving research instrument questions to the experimental class and control class. (3) The final stage of the research is data analysis, conducting hypothesis testing. The researcher compiled 40 multiple choice questions (PG) consisting of 4 answer choices that were given a score if the correct answer got 1 point and if the wrong answer got 0 points which were tested in class III A. After doing the calculations, 25 valid questions were obtained which could be used as research instrument.

Table 1. Classification of Test Items

Classification	Number of Questions	Question Number
Valid	25	1, 3, 4, 5, 6, 7, 8, 10, 11, 15, 16, 17, 18, 19, 21, 25, 26, 28, 30, 31, 32, 34, 35, 36, 39
Not Valid	15	2, 9, 12, 13, 14, 20, 22, 23, 24, 27, 29, 33, 37, 38, 40

Questions that are already valid must be retested using the reliability test with the formula $KR = \frac{r_{count}}{r_{table}}$. Because a good question must be reliable. With the results of the calculation of $r_{count} > r_{table}$ $0,871 > 0,361$. So it was concluded that the 25 questions were reliable.

Table 2. Reliability Test Results

N	N	r _{count}	r _{table}
25	40	0.871	0.361

Supporting instruments in the form of data documentation are syllabus, lesson plans, student attendance, Student Worksheets (LKPD) and taking pictures or photos to strengthen evidence of research implementation. After doing research at SDN Srengseng Sawah 04 Pagi in class III, the data that has been obtained must be re-tested in testing the analysis requirements. Normality test using test formula *liliefors* to get a normal population. The calculation of the normality test is as follows:

Table 3. Normality Test Criteria

Group	L _{count}	L _{table}
Experiment	0.02255	0.157
control	0.0194	0.157

From the above calculations it can be concluded that $L_{count} < L_{table}$ namely in the experimental class $L_{count} = 0.02255$ and L_{table} with a significant level = 0.05 that is 0.157 while the control class $L_{count} = 0.0194$ and L_{table} with a significant level = 0.05, namely 0.157 H_0 accepted and H_1 is rejected, then the students' mathematics learning outcomes in the second class population are normally distributed. The next analysis requirements test is the homogeneity test using the test formula *fisher* to determine whether or not the data is homogeneous from the two classes. The following is the calculation of the homogeneity test:

Table 4. Homogeneity Test Criteria

Group	Variance	F _{count}	F _{table}
Experiment	150.8	1.44	1.84
Control	104.4		



From the above calculation it can be concluded that $F_{count} < F_{table}$. $F_{count} = 1.44$ and F_{table} with a significant level = 0.05, namely 1.84. H_0 accepted then the variance of the two classes is in a homogeneous position. Testing the last analysis requirements is hypothesis testing using the t-test formula. To find out whether there is an influence or not in this study.

Table 5. Test Criteria Test

Class	Flat - flat	Dk	tcount	ttable
Experiment	81.34	62	13,718	1,999
Control	67.21			

$$\begin{aligned}
 X_1 &= 81.34 & X_2 &= 67.21 \\
 SD_1 &= 150.8 & SD_2 &= 104.4 \\
 N_1 &= 32 & N_2 &= 32 \\
 (dk) &= 32 + 32 - 2 = 62
 \end{aligned}$$

From the calculation of the t-test obtained $t_{count} = 13,718$ while t_{table} with a degree of freedom $(dk) = 62$ at a significant level = 0.05 of 1.999. because t_{count} and T_{table} known $t_{count} > t_{table}$ $13,718 > 1.999$. Based on the test criteria:

$t_{count} < t_{table} =$ then H_0 accepted, meaning that there is no significant effect. $t_{count} > t_{table} =$ then H_0 rejected, meaning that there is a significant effect.

Thus from the results of the above calculations it can be concluded that H_0 rejected, meaning that there is a visible effect of the difference in treatment between the learning outcomes of the experimental class and the control class. After the implementation of the learning model Numbered Heads Together (NHT) in the experimental class there was a change, it was seen that students were enthusiastic and active in learning mathematics because students could interact with teachers and fellow students in the discussion process with the help of audio-visual media in the form of video. So that the material being studied can be mastered and produce good learning outcomes. It will be different from the learning outcomes in the control class because of differences in practice in the learning process. The treatment applied in the control class only carried out the process of seeing and listening to what was explained by the teacher without any interaction interaction so that students were passive and less enthusiastic about learning mathematics. Not free to seek information but only rely on information from the teacher alone.

In this study the application of the learning model Numbered Heads Together (NHT) on the angle material. Namely the parts of the angle and the types of angles, influences the mathematics learning outcomes of class III SDN Srengseng Sawah 04 Pagi. The results showed an average value of 81,34 for the experimental class and 67,21 for the control class. Therefore, teachers should continue to apply the learning model Numbered Heads Together (NHT) in schools because it has been proven to help achieve good mathematics learning outcomes.

The results of this study were strengthened by the research conducted by Jati Sugiyadnya, Wiarta, Adnyana Putra with the title "The Effect of the Cooperative Learning Model of NHT Learning on Mathematics Knowledge". 5% so that $t_{count} = 3.97 > t_{table} = 2,000$. The NHT type of cooperative learning model the mathematics knowledge of class V SD Gugus I Gusti Ngurah Rai in the 2018/2019 academic year (Sugiyadnya, 2019). The research conducted by Siti Khoiriyah with the title



"Implementation of the NHT Type Cooperative Learning Model in Mathematics Learning" obtained the results with a one-sided t-test obtained $t_{count} = 11,221$ greater than $t_{table} = 1,648$ so H_0 is rejected. This shows that the average learning outcomes of mathematics with the NHT type cooperative learning model are higher than student learning outcomes using the direct learning model (Khoiriyah, 2018). Furthermore, the research conducted by Faridah Anum Siregar with the title "The Influence of the NHT Type Cooperative Model on Student Learning Outcomes of Class VIII SMP Negeri 18 Medan" obtained the results of research with t test obtained $t_{count} = 2.458$ with a probability of $0.017 < 0.05$ this means that there is a significant effect the use of the NHT-type cooperative model on student learning outcomes in the sub- subject of pressure on liquids in the even semester of the 2009/2010 school year (Siregar, 2012).

Conclusion

Use of learning models cooperative type Numbered Heads Together (NHT) aims to analyze the effect of the learning model cooperative type Numbered Heads Together (NHT) on the mathematics learning outcomes of elementary school students. The results of this study prove that the type cooperative learning model Numbered Heads Together (NHT) affects on mathematics learning outcomes by being proven by testing the hypothesis using the t test as follows. Based on the provisions of $t_{count} > t_{table}$ with result $t_{count} 13,718$ and $t_{table} 1.999$ so that the results of this study explain the significant influence on student learning outcomes, the results of this study explain the significant influence on student learning outcomes. The effect of using the learning model cooperative type Numbered Heads Together (NHT) is that students are more active in asking questions when the teacher is explaining or discussing, as well as increasing student interaction in the classroom and learning is not teacher-centered. Teachers can use this learning model to increase students' enthusiasm so that student learning outcomes increase.

Recommendation

The recommendations submitted based on this research are: (1) for students, with models Numbered Heads Together (NHT). Students are expected to be active, creative and enthusiastic during the learning process. (2) for teachers, learning model Numbered Heads Together (NHT) can be used in learning, especially in mathematics. (3) Principal, it is expected to participate in creating and encouraging the use of the NHT model for teaching and learning activities.

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