

## THE EFFORT TO INCREASE MATHEMATICS LEARNING COOPERATION BY USING COOPERATIVE MODEL OF NUMBERED HEADS TOGETHER TYPE OF STUDENTS CLASS VIII

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### ABSTRACT

This research is motivated by the lack of student learning cooperation in learning mathematics. This study aims to improve student learning cooperation using the Numbered Heads Together (NHT) type of cooperative learning model for class VIII students of State Junior High School (SMP Negeri) 1 Pleret, Bantul Regency in the academic year 2019/2020. Research is a research action class that comprises over two cycles. Setting the research sets class VIII E SMP Negeri 1 Pleret half even regency of Bantul year lesson 2019/2020, with 32 students. Data collection methods used were observation and interviews. The instruments used were observation sheets, interview guidelines, and field notes. The test instrument that is used is the test of the validity of the content. Analysis of the data used is descriptive qualitative. The study results showed that the cooperative learning type NHT improved cooperation learning math student class VIII semester of even SMP Negeri 1 Pleret District Bantul years mop teachings of 2019/2020. This is evident from observations of students' mathematics learning collaboration, which has increased every cycle. In cycle I percentage of cooperative learning of mathematics students is 55,49 % with the criteria sufficiently. In cycle II the percentage of students mathematics learning cooperation was 78,89 % with good criteria. Interviews with students showed that students are interested and feel happy to learn math using a model of learning cooperative type NHT.

**keywords:** cooperation, a model of learning, NHT

### INTRODUCTION

Education has an important role, especially for the nation's progress in various fields and the nation's intellectual life in educating students to produce quality human beings and realize the real human personality. Education can affect human development in aspects of personality and life, as well as having an influence on their lives in the future.

Education in Indonesia can be carried out through education and education levels. The education pathway consists of formal education pathways, non-formal education pathways, and informal education pathways. One of the formal education pathways is at the junior high school level. Education carried out at the junior high school level is carried out through learning activities and mathematics learning.

Mathematics is an essential lesson for every education level in Indonesia, from primary education to tertiary education. Learning mathematics can improve students' ability to think critically, think logically, systematically, creatively, and innovatively so that students who learn mathematics can apply it in everyday life. Mathematics is a very important lesson in shaping quality students because mathematics is a means of thinking to study something that makes sense and is organized.

Based on the results of an interview conducted on Wednesday, September 11, 2019, with Mrs. Kisyanti, S.Pd, as a mathematics teacher at SMP Negeri 1 Pleret, Bantul Regency, said that the learning model used in the learning process of mathematics is direct learning, but students are less active. During the learning process, the teacher presents the material, gives examples of questions, gives practice questions on the board, and asks one of the students to solve the questions in front. In that case, many less active students do not pay attention, so that they cannot complete the teacher's practice questions. Students are also still embarrassed to express their opinions, and sometimes some students can finish but are not confident to express it. During the learning process, many students are still busy talking outside of learning

with their friends. When learning is done in groups, students discuss between groups. However, there are still many less active students, lack collaboration with their group friends, students tend to depend on their friends doing the assignments, waiting for answers from other friends, and when students are appointed to move forward, students lack confidence with the answer and feel afraid to do the writing board.

Based on the results of interviews and observations conducted by researchers on Wednesday, September 18, 2019, at SMP Negeri 1 Pleret Kapupaten Bantul, when the learning process took place, students still looked passive, mathematics teachers also use direct learning models in delivering learning material, and teachers rarely use group learning. When students conduct discussions between groups, some students are less active, do not pay attention, and speak outside the learning material. There are still some students who depend on friends when doing assignments. While others are working on their groups' problems, some students wait for answers from other friends. These students do not want to try to do it themselves first, so they cannot work on the learning material.

Learning is needed to actively involve the role of students in learning activities to improve mathematics learning collaboration. One of the learning models that can involve active students' role is that the cooperative learning model is very suitable for mathematics learning. In learning mathematics, it is not enough only to know and memorize mathematical concepts. However, it also requires an understanding and ability to solve mathematical problems that are good and right.

Seeing student mastery of mathematics material, in this study, the learning model chosen was the NHT type of cooperative learning model. According to Ngatini in Pratiwi, Destiani (2018: 4), the NHT learning model teaches students to work together and are always ready to answer questions raised by teachers. Researchers are interested in applying the NHT type cooperative model because when learning takes place, students occupy a very dominant position and cooperation occurs between group members with the main characteristic of numbering, so that all students try to understand the material being taught because the teacher will appoint students by mentioning any number to represent the group completing questions and answer questions.

According to Johnson in Edwin (2016), collaboration or joint learning is a team process (group) in which its members support and rely on each other to achieve a consensus outcome. Collaboration in the context of learning involving students in the opinion of Huda, Miftahul (2016), namely: When students work together to complete group assignments, they often try to provide information, encouragement, or advice to their groupmates who need help.

## **METHODS**

This research activity was carried out at Pleret 1 Junior High School in Bantul Regency in the 2019/2020 Academic Year. The researcher took the research setting of class VIII E with 32 students using the NHT type of cooperative learning model to improve student mathematics learning collaboration. This type of research is Classroom Action Research (CAR). CAR is a form of research conducted in class. CAR is generally carried out by the teacher in collaboration with the researcher or himself as the teacher has the dual role of conducting individual research in the classroom, at school, and where he teaches for 'improving' or 'improving' the learning process.

According to Arikunto, Suharsimi (2008: 23) explained that a class action could be carried out at least in two consecutive action cycles in research. Information from the first cycle will determine the shape of the second cycle and the next cycle. Therefore the second cycle, the third cycle, and so on cannot be designed before the first cycle is carried out. The results of reflection are used as input for planning the second cycle and the next cycle. The four steps that can be carried out in this research are the elements that can form a cycle, namely one round of sequential activities, which later returns to the original step. The four stages are planning, implementation, and reflection.

Data collection techniques in this study used observation of students' mathematics learning collaboration and interviews. Data collection instruments were observation sheets containing notes on student learning collaboration undertaken by students and interview guidelines for obtaining data on

student collaboration. The formula for calculating the increase in the number of students who play an active role in mathematics learning is as follows:

$$\text{Percent of Student Activity (PAS)} = \frac{(\text{Score obtained by students})}{(\text{maximum score})} \times 100\%$$

## RESULTS AND DISCUSSION

This classroom action research was carried out using the NHT type of cooperative learning model in two cycles. Each cycle consisted of 4 stages, namely, planning, implementing, observing, and reflecting. In the first cycle, two meetings were held, and in the second cycle, two meetings were held. Every action is taken by applying the cooperative learning model type NHT. In this study, the researcher acted as a teacher, with the implementation of the NHT type of cooperative learning model expected to increase at each meeting. The actions taken are more directed toward increasing student mathematics learning collaboration. The following is a description of the results of the research carried out in each cycle:

### Cycle I

Before starting learning, the researcher makes preparations by compiling curriculum analysis to find out the basic competencies that will be delivered to students through cooperative learning with the NHT type, making a Learning Implementation Plan (RPP) for the Pythagorean theorem material, making a Student Activity Sheet (LKS), compiling Student learning cooperation observation sheet, preparing student study groups.

In the learning implementation stage, researchers divided students into groups divided into six groups consisting of 5-6 students in one group. Researchers invite students to gather with their respective groups. Then the researchers distributed head numbers to each group. At the first meeting, the researcher continued to explain the Pythagorean theorem's material, and then the researcher invited the students if anyone wanted to ask questions. After that, the researcher gave the student activity sheet to be done with his group mates, and then the researcher called the head number to come to the front of the class to present the results of the group discussion. The learning process got a good response and from the students, and the results of the interview, the students were already seen actively collaborating with their groupmates.

Observations were made by looking at observations in the first cycle; the results showed that some students still lack collaboration with the group because they are lazy, there is still a lack of student responsibility to do assignments with their groups because they are busy playing, there is still a lack of students to remind other friends because they do not know, communication between members there are still a few students who do not listen to their friends' opinions. The group process to perfect their friends' opinions is still low because they are lazy.

The results of interviews with students also strengthened observation results. At the first meeting, some were still confused with the cooperative learning model type NHT used because students were not accustomed. However, students felt happy and not boring with the cooperative learning model NHT. Before proceeding to the second cycle stage, the next step is reflection. Based on the implementation of the observation and interview actions at the first and second meetings in the first cycle, the implementation of the learning process was not so maximal that a reflection was held on the results of observations and student interviews conducted as material to determine the actions in the second cycle.

### Cycle II

Based on the analysis and reflection results in the first cycle, the researcher decided to take further action to maximize the improvement of student learning cooperation in learning mathematics. This cycle II action uses the same method as the one in cycle I. The material given in cycle II is the continuation of cycle I. The planning phase in cycle II is carried out to compile a RPP, compile a LKS, and prepare the study group.

At the implementation stage, guidance is given to groups still experiencing difficulties carrying out the tasks given. Researchers carry out learning by the steps of the NHT type of cooperative learning model.

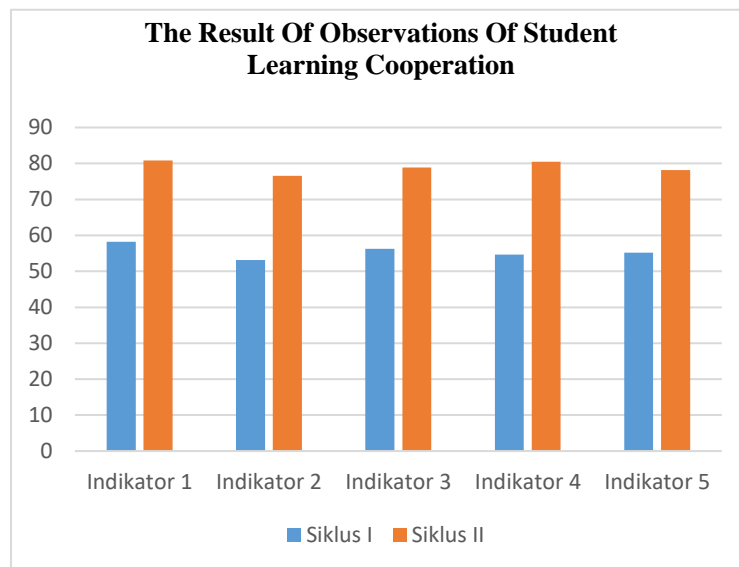
At the observation stage seen from the results of observations of students' mathematics learning collaboration has increased. Students have collaborated with the group. Students are responsible for doing the group tasks. Students have begun to remind friends in one group, communication between members in the group is good, and the group process in perfecting their friends' opinions is also fair. The results of student interviews also strengthened observation results; students said they were pleased to learn using the NHT type of cooperative learning model.

The reflection phase is based on the implementation of actions and observations at the first meeting. In the second meeting in the second cycle, students can follow the learning well with the NHT type of cooperative learning model. Learning that has been done in the action cycle I and cycle II through applying the cooperative learning model NHT has increased the cooperation of learning mathematics in mathematics learning. The results of this study are shown as follows:

**Table 1.** Increasing Cooperation between Students in Cycle I and Cycle II

Indicator	Cycle I (%)	Cycle II (%)	Information
Group Collaboration	58.20	80.86	Increase
Group Responsibility	53.13	76.56	Increase
Promotive Interaction	56.25	78.90	Increase
Member Communication	54.69	80.47	Increase
Group Process	55.21	78,13	Increase
<b>Average</b>	<b>55.49</b>	<b>78.98</b>	<b>Increase</b>

Based on the results of observations of mathematics learning cooperation, students have increased in every aspect observed after being implemented using the cooperative learning model type NHT can be seen as follows:



**Figure 1.** Graphic for Improving Student Learning Collaboration

After taking action from cycle, I to cycle II using the cooperative learning model type, NHT can improve student mathematics learning cooperation by looking at the practical aspects, namely:

1. Group collaboration in the first cycle of 58.20% increased to 80.86% in the second cycle.
2. The group's responsibility in the first cycle of 53.13% increased to 76.56% in the second cycle.
3. Promotive interactions in the first cycle of 56.25% increased to 78.90% in the second cycle.
4. Communication between members in the first cycle of 54.69% increased to 80.47% in the second cycle.
5. The group process in the first cycle of 55.21% increased to 78.98% in the second cycle.

6. The average results of observations of student collaboration in cycle I was 55.49% with sufficient criteria. In the second cycle, the average results of student learning cooperation observations were 78.98% with good criteria.

Student responses to mathematics learning using the NHT type of cooperative learning model are very good, seen from interviews with student representatives. Based on the results of the interview, the following results are obtained:

1. Mathematics learning using NHT type cooperative learning models can improve student learning collaboration.
2. The process of learning mathematics using the NHT cooperative learning model runs smoothly. Students can work together to help and accept the help of friends in their groups who encounter problems.
3. Learning mathematics using the NHT type of cooperative learning model when presenting group discussions results is considered acceptable because it makes students active, not monotonous.
4. Learning mathematics using NHT type cooperative learning models do not seem boring and fun.
5. Mathematics learning using NHT type cooperative learning models gets positive responses from students, and this learning model is supported for use.
6. Mathematics learning using the NHT type learning model by giving head numbers does not make it students difficult to use this model. Students feel more fun, and each student is responsible.
7. Students respond positively to using the NHT type of cooperative learning model during group discussions because it can enhance group collaboration. All students try to understand the group's tasks.

Learning using the NHT cooperative model can improve students' positive attitudes in learning mathematics and build a confident attitude to eliminate fear with math lessons. It also makes students feel happy because students feel not boring. Interaction in NHT type cooperative learning makes students feel more accountable to individuals and groups. Individuals must be prepared if the teacher calls to present their group discussion to the class.

Overall, after implementing the cooperative learning model type, NHT can improve student mathematics learning cooperation from the first cycle and increase in the second cycle. Judging from the analysis of students' mathematics learning, cooperation in learning mathematics in the first cycle and second cycle increased from cycle I to cycle II. Cycle I shows the average percentage of students learning cooperation in mathematics in the criteria of enough. The average percentage of learning cooperation in mathematics has reached  $\geq 61\%$  in the second cycle, which means that students' mathematics learning cooperation in learning mathematics has reached good criteria.

Based on the results of the interview above, it can be concluded that learning mathematics using the NHT cooperative learning model can make students more comfortable to understand the subject matter and more fun because students play an active role in learning activities. Students are also more active in exploring the material by exchanging opinions with their friends.

From all of these data, it can be concluded that this study's objectives have been achieved in cycle II so that this research is considered complete. This study's results indicate an increase in mathematics learning cooperation in mathematics learning using the NHT type of cooperative learning model in-class students VIII E Even semester of SMP Negeri 1 Pleret Bantul Regency in 2019/2020.

The results of this study can be strengthened by the previous research conducted by Ariska Aprilyana (2018) in her study entitled Efforts to Increase Mathematical Learning Collaboration by Using an NHT Cooperative Model for Class VII Students of Odd Semester Semester SMP Negeri 1 Nanggulan, Kulonprogo Regency Academic Year 2017/2018 concluded that the application of the cooperative learning model type NHT could improve student mathematics learning collaboration. This study is in line with research conducted by Andri Wijaya (2016) entitled Efforts to Increase Student Collaboration by Using the NHT Cooperative Model for Class VIII Students of SMP Muhammadiyah 2 Minggir Sleman Regency, Odd Semester 2015/2016 Academic Year. Overall it can be concluded that learning

mathematics through the cooperative learning model type NHT can be used as an effort to improve student mathematics learning cooperation.

### **CONCLUSION**

The use of cooperative learning model type NHT can improve student learning cooperation in class VIII E even semester of SMP Negeri 1 Pleret Bantul Regency. Based on the analysis of observational data, it was found that in the first cycle, the average percentage of the results of observations of students' mathematics learning collaboration was 55.49% with sufficient criteria. The average percentage of student mathematics learning cooperation results increased to 78.98% with good criteria in the second cycle. Mathematics learning using NHT type cooperative learning models gets positive responses from students. The results of interviews with students evidence this. Students become more enthusiastic in learning mathematics, learning activities more fun for students.

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