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Increasing Mathematics Learning Activities Through Numbered Heads Together (NHT) Cooperative Learning Models In Students

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ABSTRACT

Purpose of the study: The purpose of this study is to see an increase in mathematics learning activity through the cooperative learning model of the numbered heads together type in junior high school student.

Methodology: This study uses a type of classroom action research. The subjects in this study were teachers and junior high school students. This study consisted of 3 cycles, namely cycle 1, cycle II, and cycle III. Sources of data in this study were obtained from observation sheets of student learning activities in cycle I, cycle II, and cycle III, observation sheets of the learning process recorded by observers, teacher and student information, places and events in which the learning process takes place. place. This research is expected to contribute to schools or in the field of education.

Main Findings: The results of this study are that there is an increase in students' mathematics learning activities through the application of the Numbered Heads Together (NHT) cooperative learning model in learning mathematics.

Novelty/Originality of this study: Provide understanding in implementing cooperative learning type Number Heads Together (NHT) and assist in selecting a more varied learning model so as to increase the participation of students in learning so that learning mathematics in schools becomes better.

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1. INTRODUCTION

Mathematics is a compulsory subject that exists at almost all levels of education [1]. In fact, mathematics lessons are often considered difficult by students. In learning mathematics that occurs in the classroom, the teacher is expected to be able to create learning conditions that can arouse students' enthusiasm for learning so that students have the courage, skills and have good and even satisfying mathematics learning outcomes. However, in the development of mathematics learning in schools today, it seems as if students only receive, listen to, record explanations given by the teacher and work on problems according to examples and directions from the teacher [2]–[4]. So that students will find it difficult if the teacher gives questions that are different from the examples that have been taught by the teacher before. In addition, if the teacher repeats the material presented, students tend to be silent. It can be said that students are passive so there is no reciprocity between the teacher and students during the learning process [5], [6]. This can be caused by the learning process

in the class that is not good, the application of learning models that are not in accordance with the conditions of the class, or students who are not enthusiastic about learning.

Efforts that can be made to increase student learning activities are by applying an appropriate learning model so that they can achieve the objectives of the learning [7]–[9]. Previously the teacher had implemented the STAD type cooperative learning model in the class. However, in practice it is not maximized so that problems arise due to the low learning activity of students. Actually the cooperative learning model has the goal of developing students' social skills so that they can maximize students' learning conditions to achieve a learning goal, where students are expected to be able to play an active role in learning. So that the teacher only participates as a facilitator while students study in groups [10]. Seeing the objectives of cooperative learning, the teacher and researcher agreed to apply the cooperative learning model in this study as well, but with a different type. Cooperative learning consists of various types of learning models, one of which is the Numbered Heads Together (NHT) cooperative learning model [11]–[13]. By applying the Numbered Heads Together (NHT) cooperative learning model in learning in the class, it is hoped that it will be able to overcome the problems that arise in the class.

This Numbered Heads Together (NHT) learning model indirectly trains students to share information with each other, listen carefully and speak calculatingly, so that students are more productive in learning [11], [14]. When applied in classroom learning, this learning model can encourage students to be more active and responsible both in terms of working together in groups and in understanding the material presented. By applying the Numbered Heads Together (NHT) cooperative learning model, the teacher wants to try to improve the learning process in class VIID and increase student learning activities, especially student activities in study groups. So that students can work well together with fellow members in their respective groups. In addition, the distinctive feature of the Numbered Heads Together (NHT) cooperative learning model is the numbering of students. With this numbering, it is hoped that students can be responsible for understanding learning material both for themselves and for friends in their group, so that they will be able to achieve other learning objectives, namely the teacher hopes to develop abilities in creating a teaching and learning activity that is conducive and more meaningful for students. , as well as helping students to better understand the material and become more active during the learning process [15]–[17]. This research is in line with research conducted by Rahayu & Suningsih which said that the average student learning outcomes in mathematics using the NHT type cooperative learning model was greater [18].

The purpose of this classroom action research is to increase students' mathematics learning activities in class and improve the learning process in class so that there is an increase in students' learning activities by applying the Numbered Heads Together (NHT) cooperative learning model to junior high school . The questions posed in this study are as follows.

1. How to increase students' mathematics learning activities in the learning process by applying the Numbered Heads Together (NHT) type cooperative learning model for junior high school student?
2. How is the application of the Numbered Heads Together (NHT) cooperative learning model in the mathematics learning process so that there is an increase in mathematics learning activities?

2. RESEARCH METHOD

This classroom action research was carried out in junior high schools. The research approach used in this research is a qualitative approach with the form of research used, namely Classroom Action Research (PTK) or Classroom Action Research (PTK). Classroom action research is a method for knowing good learning in the classroom so that it can improve student learning [19], [20]. The subjects in this classroom action research were teachers and junior high school students, totaling 32 people and consisting of 14 male students and 18 female students.

The data collected in the research on the application of the Numbered Heads Together (NHT) cooperative learning model in the mathematics learning process is the result of observing student learning activities. While the data sources in this study were obtained from observation sheets of student learning activities in cycle I, cycle II, and cycle III, observation sheets of the learning process recorded by observers, teacher and student information, places and events where the learning process took place.

3. RESULTS AND DISCUSSION

This research was conducted by applying the Numbered Heads Together (NHT) cooperative learning model with the aim of increasing students' mathematics learning activities in the class. There are 3 (three) cycles of action in this classroom action research, where in each cycle observations are made of students' learning activities and observations of the implementation of learning by applying the Numbered Heads Together (NHT) cooperative learning model which can increase student learning activities.

3.1. Increasing Student Mathematics Learning Activities by Applying the Numbered Heads Together (NHT) Cooperative Learning Model

Observations made in this classroom action research included observations of students' mathematics learning activities. Classroom action research in this study begins with pre-cycle activities. Data from the triangulation results of the average acquisition percentage of student learning activities can be seen in the table below:

Table 1. Percentage of Student Learning Activities in the Pre-Cycle

No.	Aspects of Learning Activities Learners	Average Percentage of Each Aspect (%)
1.	Watching and Listening Activities	68.76
2.	Oral Activity	59.38
3.	Writing and Drawing Activities	54.69
4.	Motor Activity	53.13
5.	Mental Activity	51.57
6.	Emotional Activity	67.19

In the para-cycle activities, it was found that the average percentage of students' mathematics learning activities for the viewing and listening activity aspects was 68.76%, the oral activity aspects were 59.38%, the writing and drawing activity aspects were 54.69, the motor activity aspects were 53.13%, the mental activity aspect is 51.57%, and the emotional activity aspect is 67.19%. From the results of observations and discussions conducted with class teachers, the acquisition of students' mathematics learning activities is related to the implementation of the learning process in class, which also affects the learning completeness of students in that class. The low learning activity of students is thought to be caused by the selection of an inappropriate learning model. Therefore, action I was carried out by applying the Numbered Heads Together (NHT) cooperative learning model. This learning model is a strategy in the cooperative learning model where in its implementation there are syntax or rules for thinking together in a heterogeneous group as well as the numbering of each student in the group. With these rules, it is hoped that there will be interaction between students in group discussions so that they can work cooperatively in the group. This will bring up students' skills, for example in asking questions, discussing and making presentations in front of the class independently.

Table 2. Average Percentage of Students' Mathematics Learning Activity in Cycle I

No.	Aspects of Learning Activities Learners	Average Percentage of Each Aspect (%)
1.	Watching and Listening Activities	73.44
2.	Oral Activity	64.07
3.	Writing and Drawing Activities	57.82
4.	Motor Activity	56.25
5.	Mental Activity	67.19
6.	Emotional Activity	73.44

From the results of observations made in the first cycle of action, it was obtained an average increase in the percentage of students' mathematics learning activities, which was 4.68% from 68.76% to 73.44% for the aspects of seeing and listening activities, amounting to 4.68% of 59.38 to 64.07% for aspects of oral activity, amounting to 3.12% from 54.69% to 57.82% for aspects of writing and drawing activities, amounting to 3.12% from 53.13% to 56.25% for the aspect of motor activity, it was 15.62% from 51.57% to 67.19% for the aspect of mental activity, and by 6.25% from 73.44% to 76.25% for the aspect of emotional activity. In the first cycle action, overall the average percentage of students' learning activities increased by 6.25% compared to the pre-cycle action. However, this increase has not been in accordance with the research success targets that have been determined jointly by the teacher and researcher. Obstacles or deficiencies identified from the implementation of cycle I, namely the use of inappropriate time allocations, the calling of student numbers was still carried out together for all groups and the learning activities of students as a whole were still low. So it is necessary to carry out further actions to improve the previous cycle, namely cycle II. Cycle II actions were carried out by reflecting on some of the obstacles that occurred in cycle I and following up on the results of these reflections by making improvements to cycle I actions.

Table 3. Average Percentage of Students' Mathematics Learning Activity in Cycle II

No.	Aspects of Learning Activities Learners	Average Percentage of Each Aspect (%)
1.	Watching and Listening Activities	90.63
2.	Oral Activity	84.38
3.	Writing and Drawing Activities	71.88
4.	Motor Activity	65.63
5.	Mental Activity	85.94
6.	Emotional Activity	76.57

The second cycle of action still applies the Numbered Heads Together (NHT) cooperative learning model which is a reflection of the second cycle of action. From observations made in cycle II, the results obtained were that the average increase in the percentage of students' mathematics learning activities was 17.19% from 73.44% to 90.63% for the aspects of seeing and listening activities, amounting to 20.34% of 64 .07% to 84.38% for aspects of oral activity, amounting to 14.07% from 57.81% to 71.88% for aspects of writing and drawing activities, amounting to 9.38% from 56.25% to 65.63% for the aspect of motor activity, it was 23.44% from 67.19% to 85.94% for the aspect of mental activity, and 12.49% from 73.44% to 76.57% for the aspect of emotional activity. In the action cycle II, overall the average percentage of students' learning activities increased by 13.80% compared to the action in cycle II. However, this increase is still not in accordance with the research success targets that have been determined. The weakness that was observed by the researcher in the action of cycle II was that when calling students' numbers to answer questions or presenting the results of their group discussions in front of the class, the teacher had not specifically called the numbers from each group. Actually the purpose of calling by not pointing to just one number is that the students dare to voluntarily represent their group, but in practice this actually makes students scramble to come to the front of the class which causes class conditions to become less conducive. In addition to this, the learning activities of students, especially in indicators of motor activity, are still low. So it is necessary to take further action, namely to carry out cycle III actions. Cycle III actions are carried out by reflecting on some of the obstacles that occurred in cycle II and following up on the results of these reflections by making improvements to cycle II actions.

Table 4. Average Percentage of Students' Mathematics Learning Activity in Cycle III

No.	Aspects of Learning Activities Learners	Average Percentage of Each Aspect (%)
1.	Watching and Listening Activities	93.76
2.	Oral Activity	87.50
3.	Writing and Drawing Activities	85.94
4.	Motor Activity	87.51
5.	Mental Activity	87.51
6.	Emotional Activity	89.06

After the action of the third cycle, the average percentage of students' learning activities for the viewing and listening activity aspects was 93.76%, an increase of 3.13% when compared to the second cycle action which obtained a result of 90.63%. There was an increase of 3.12% for aspects of oral activity from 84.38% to 87.50%, an increase also occurred in aspects of writing and drawing activities by 14.06% from 71.88% to 85.94%. Aspects of motor activity experience an increase of 21.88% from 65.63% to 87.51%. The mental activity aspect increased by 1.57% from 85.94% to 87.51%, and the emotional activity aspect increased by 12.49% from 76.57% to 89.06%. From these results as a whole there was an increase in students' mathematics learning activities in the third cycle action compared to the second cycle action of 9.38%. In this third cycle, students' mathematics learning activities as a whole have reached the target set by teachers and researchers, namely $\geq$ 85%. So that this class action research is considered to have been successful by carrying out three cycles of action.

From the results of the analysis of the three cycles in this study, it shows that there is an increase in students' mathematics learning activities through the application of the Numbered Heads Together (NHT) cooperative learning model. This is in accordance with the results of research conducted by Tusini that the application of the Numbered Heads Together (NHT) cooperative learning model can increase the activity and learning outcomes of students as seen from the increase in the percentage of students who are active and the percentage of students who complete at the end of cycle III exceeds established indicators of success.

3.2. The Process of Learning Mathematics by Applying the Numbered Heads Together (NHT) Cooperative Learning Model

Based on the results of the observations made, it was concluded that the learning process by applying the Numbered Heads Together (NHT) cooperative learning model can increase students' mathematics learning activities as previously described. In addition to observations made to observe the mathematics learning activities of students in junior high school, observations were also made on the learning process in which an increase in students' mathematics learning activities was obtained by applying the Numbered Heads Together (NHT) cooperative learning model, which is also related to the level of learning completeness of the participants. educate.

Before taking action with the application of the learning model, observations were first made on the initial activities before the research, namely pre-cycle activities. From the results of observations made on the process of learning mathematics in the pre-cycle, the percentage of the implementation of learning in this pre-cycle was 62.75%. While the percentage of students' mathematics learning completeness in the pre-cycle was obtained at 34.38% with a class average of 69.06. This means that it can be concluded that the implementation of learning in this pre-cycle is still not good, so that it affects the learning outcomes of students in the class. The low learning outcomes of students are likely to be influenced by the implementation of the learning process by applying the STAD type cooperative learning model which is not yet suitable for students in junior high school. So that the teacher and researcher agreed to conduct classroom action research by improving the learning process in the class, namely by applying the Numbered Heads Together (NHT) cooperative learning model in junior high school.

Learning carried out in cycle I applies the Numbered Heads Together (NHT) cooperative learning model, in which in the learning process students in each group are given group activity sheets (LKK) which contain problems that must be solved by students together in group. The LKK contains issues related to social arithmetic material, especially regarding selling and buying prices as well as profits and losses in the buying and selling process. Observation of the learning process that has been carried out shows that the percentage of implementation of learning in cycle I is 64.35%, an increase of 1.60% from the pre-cycle which was only 62.75%. The percentage of participants' mathematics learning completeness was 37.50%, an increase of 3.12% from the previous 34.38%, and the class average was 55.16. When compared to the implementation of learning in the first cycle, it experienced an increase compared to the pre-cycle which was followed by an increase in the percentage of students' learning completeness.

The research was continued by carrying out cycle II actions to reduce the weaknesses found in cycle I. The learning carried out in cycle II still applied the Numbered Heads Together (NHT) cooperative learning model, in which in the learning process students in each group were given group activity sheets. (LKK) which contains problems that must be solved by students together in groups. LKK in cycle II was made in such a way that it adapted to the learning tools that the teacher inserted in the form of pictures and concrete objects. This was done to overcome the weaknesses in the previous cycle actions. One of the weaknesses that was tried to be overcome in cycle II was calling student numbers when answering questions and presenting the results of their group work in front of the class. If in cycle I the teacher calls one number of students from all groups to move more quickly to the front of the class, in cycle II the teacher calls only one number of students from a certain group. This can minimize students who sit in the front forward continuously and make class conditions more conducive. From the observation results, it was obtained that the percentage of learning implementation in cycle II was 77.31%, an increase of 12.96% from cycle I which was only 64.35%. Meanwhile, the percentage of students' mathematics learning completeness was 59.38%, an increase of 21.88% from the previous 37.50% with a class average of 71.25. The acquisition of these results experienced an increase in percentage when compared with the results of observations obtained in cycle I. The increase in the implementation of learning was followed by an increase in the percentage of learning completeness in junior high school student.

Improvements in the learning process carried out in cycle II showed better results, but the learning activities of students were not in accordance with the targets to be achieved by teachers and researchers, so further action was needed, namely cycle III actions. Cycle III actions are carried out to correct the weaknesses found in cycle II and are expected to increase student learning activities according to the targets set. Seeing the achievements in the actions of cycle II, the teacher and researcher agreed to carry out learning by applying the Numbered Heads Together (NHT) cooperative learning model by overcoming the problems or weaknesses encountered in cycle II. The problem of dialing student numbers that had been tried to be corrected in cycle II turned out to make competition between students less visible, this had an impact on students' motor activity being less developed. So that in cycle III the process of calling student numbers is improved by the teacher calling even or odd numbers from certain groups to answer or come to the front of the class. With these improvements, it turned out that students were more enthusiastic and took the initiative to represent their groups. This has an impact on increasing the percentage of learning implementation and learning completeness of students. The percentage of learning implementation in cycle III was 85.16%, an increase of 7.85% compared to cycle II which was only 77.31%, while the percentage of students' mathematics learning completeness was

78.13% which also experienced an increase from the previous action. that is equal to 18.75% of 59.38% with a class average of 80.44.

Based on the results of observations obtained during the research that was carried out, it can be concluded that by applying the Numbered Heads Together (NHT) cooperative learning model that has been implemented, it can improve student learning outcomes in junior high school. This is consistent with the research conducted by Nuraini Faya Puspitasari that before the class action research was carried out the percentage of students' completeness was only 57%, and after 2 learning cycles were carried out by applying the Numbered Heads Together (NHT) cooperative learning model, the results obtained were the percentage of students' completeness 86%.

By looking at the previous discussion, it can be concluded that there is an increase in students' learning activities through the application of the Numbered Heads Together (NHT) cooperative learning model. In addition, the increase in students' mathematics learning activities has had a positive impact on student learning outcomes. This is shown in the completeness of student learning obtained from individual quizzes given to students at the end of the learning process of each learning cycle. From the three cycles that have been carried out by the researchers, it was found that the increase in students' mathematics learning activities was obtained through the learning process by applying the Numbered Heads Together (NHT) cooperative learning model.

4. CONCLUSION

Based on the results of research that has been conducted in junior high school on the subject of social arithmetic, the following conclusions are obtained. There is an increase in students' mathematics learning activities through the application of the Numbered Heads Together (NHT) cooperative learning model in learning mathematics. From the three cycles that have been carried out by the researcher, it is concluded that the increase in students' mathematics learning activities is obtained through the learning process by applying the Numbered Heads Together (NHT) type cooperative learning model with modified learning steps, namely in the core learning activities in calling student numbers are not only one number that is called to advance to answer questions or present group answers but can be done by calling odd or even numbers so that there is competition among students, so that the seating position of each group must always alternate at each meeting so that each group can feel in a different position in the class.

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