

THE APPLICATION OF THE NHT TYPE COOPERATIVE LEARNING MODEL TO IMPROVE BIOLOGY LEARNING OUTCOMES IN CLASS XI SMA NEGERI 10 MEDAN

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ABSTRACT

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This study aims to improve student achievement by applying cooperative learning model type NHT in class XI IPA I SMA N 10 Medan. This research procedure was carried out through three cycles with four stages: planning, implementing actions, observing, and reflecting. The results showed that the actions that have been taken could improve student achievement in Biology subjects in class XI IPA I SMA N 10 Medan. It is evidenced by an increasing number of students who have passed the minimum grade. In the initial conditions, 50% to 79.10% in the first cycle increased again to 100% in the second cycle. The highest score reaches 95, and the lowest score is 70. In addition, the NHT cooperative model can increase learning motivation. Students who are characterized by increased student learning activities.

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INTRODUCTION

The demands of the world of education today require teachers to have the ability to design excellent and effective learning processes with an orientation to improving the quality of students. Teachers must be able to develop learning and teaching materials following certain standards and learning objectives. Teachers must regulate the design of learning activities, learning methods, student assignments, evaluations, along with the implementation time ([Gani, Arwita, et al., 2020](#)). This is done to facilitate learning in the classroom ([Rezeqi et al., 2020](#)). The objectives that have been planned by the teacher as the learning designer can be achieved optimally. Responding to learning activities in the classroom, teachers must be able to stimulate active involvement and creativity of students so that the learning process can run dynamically and fun.

Based on discussions with biology students in class XI IPA SMA N 10 Medan, information was obtained that the lecture method still dominates student learning activities in class. This method has a weakness because the information received is not related to the knowledge obtained previously so that the concepts received are easy to forget and boring. Biology learning should be done by linking concepts in real life and finding new concepts in learning ([Gani & Arwita, 2020](#)).

Besides, student activity is significantly less so that learning outcomes are not achieved ultimately. This can be seen from the results of the daily tests of students in class XI IPA I SMA N 10 Medan on the subject matter "Structure and function of the circulatory system." Even though students' activities significantly affect their thinking skills during learning ([Sanjayanti et al., 2020](#)). Responding to these problems, teachers as learning managers must be proactive in improving the quality of teaching by applying various learning strategies and models.

One of the factors directly related to student learning activities and affects the low literacy of Indonesian students is the selection of methods and models by teachers—responding to problems of learning outcomes and student activities. Teachers should provide innovation in learning biology in the classroom. Model innovations and other learning elements are carried out to make it easier for students to improve their thinking skills in applying scientific concepts to achieve maximum results ([Aiman & Ahmad, 2020](#)). Efforts to improve science learning outcomes are not only influenced by the learning carried out (influenced

by learning approach factors, such as the way teachers teach, as well as methods, models, and learning media used), but there are other factors found in students such as learning motivation ([Meilani et al., 2020](#)).

Good learning is two-way and fun. Teachers and students interact with each other and have the right to give their opinions. Teachers can direct students gradually in their learning. Students can also carry out active and practical learning, such as reading, paying attention to pictures or videos, quizzes, and learning reviews ([Gani, Zaimah, et al., 2020](#)).

Learning must be designed and implemented in a relevant, engaging, effective, and student-centered manner. Teachers need to change the "closed classroom" learning model into various student-centered models. Teachers must be able to teach comfortably in managing class dynamics and support independent learning. Teachers must also support the exploration and acquisition of new knowledge and skills to prepare students to compete in the 21st century ([Zubaidah, 2016](#)). Therefore, it is indispensable to learn using cooperative learning.

Number Head Together (NHT) is one of the cooperative learning models that teachers can use as an alternative to solving the learning problems they face. Because NHT emphasizes a group discussion in nature, it can generate creativity, reasoning power, and interaction with students. Compared to other types of cooperative models, NHT has several advantages because it is easier to implement than other types of cooperative models ([Fitrianti, 2021](#)).

To overcome these problems, the author, as a Biology subject teacher, tries to conduct classroom action research (CAR) with the title: "The Application of the NHT Type Cooperative Learning Model to Improve Biology Learning Outcomes in Class XI SMA NEGERI 10 Medan Odd Semester TA. 2019/2020".

METHOD

This research was conducted using the class action method, planned in two cycles, but if the performance indicators have not been achieved, the research continues with the three cycle. The research steps in each cycle consisted of 4 stages, namely: planning, acting, observing, reflecting ([Suryani & Seto, 2020](#)).

The data collection method used in the study was observed. Observations were used to collect data about student activities in the learning process of the NHT Cooperative Learning model, assessment, and documentation by obtaining photos of the learning process (Arikunto, 2006).

The research uses qualitative and quantitative analysis techniques (Sugiyono, 2018). Quantitative analysis, data obtained by making categorical data (based on KKM) following the assessment system applicable in the 2013 curriculum at SMA Negeri 10 Medan (very high, high, medium, low, and very low). Meanwhile, qualitative analysis is usually carried out using comparative descriptive statistics, comparing the data obtained between cycles.

RESULTS AND DISCUSSION

Description of Initial Conditions

Action research is an observation of learning activities in the form of an action, which is deliberately raised and occurs in a class together (Maftukhah & Rouf, 2021). Before the class action using the NHT Cooperative Learning Model was implemented, the researcher taught using the conventional method (lectures). At the end of the learning process, the researcher conducted a final test, and the student scores obtained in the initial conditions could be grouped according to the table below.

Based on the data table (Table 2) where the teacher teaches with conventional methods (lectures), it turns out that from 36 students, only 18 students have completed learning (50%) to improve this condition, the researcher takes action in the first cycle by applying the NHT type of cooperative learning method.

Table 1. Student Learning Outcomes Data in Initial Conditions

Value range	Category	Frequenc y	Percentage
0-35	Very low	0	0%
36-39	low	18	50 %
	Not passed	18	50 %
70-79	Fair	17	45,8%
80-89	High	1	4,10 %
90-100	Very high	0	
	Passed	18	50%
Amount		36	100 %

Description of Cycle I

Together with the observer, the teacher plans class actions to improve student

achievement in the subject of Biology (Suratni, 2017). The plan is made by (1) Determining the schedule for the implementation of the first cycle of actions from September 4, 2019, to October 18, 2019, (2) Selecting the subject matter to be taught, namely: "The structure and function of the human circulatory system," (3) Prepare lesson plans that contain NHT cooperative learning steps, (4) prepare teaching aids, (5) plan class settings, and (6) prepare assessment instruments in the form of observation papers, test student learning outcomes in the form of essay questions and learning motivation questionnaires.

The teacher carries out teaching actions in the classroom according to the lesson plans that have been prepared. The learning steps are (1) giving student motivation questionnaires. The researcher gave a motivational questionnaire to students as a parameter of student learning motivation, (2) carried out learning with the NHT type cooperative model by giving numbering, determining the concepts to be taught, creating the form of discussion groups, and determining the direction of students' thinking, (3) providing the tasks of each group are under the material provided, (4) provide opportunities for students to provide their respective answers, (5) the teacher continues to observe student activities, and (6) perform the final test in cycle 1. Analysis of learning outcomes carried out using tests to find out the value obtained by students at the end of each cycle and calculate the percentage (Harta, 2021).

Observers make observations or observations of the activities carried out. The observation format is filled in and checked according to the main activity. At the end of the first cycle, the researcher conducted a final test, and the student scores obtained are in Table 2.

Table 2. Frequency distribution of learning mastery in cycle I

Value range	Category	Frequenc y	Percentage
0-35	Very low	0	0%
36-39	low	8	20,83 %
	Not passed	8	20,83 %
70-79	Fair	19	52,08%
80-89	High	9	27,02 %
90-100	Very high	0	
	Passed	28	79,10%
Amount		36	100 %

Based on the data in table 2, we can see that the average value of student mastery in the first

cycle is in the medium category (above the KKM score). After the action was taken, it turned out that there were no more students who were in the very low category. Only eight more students were in a low category. Only eight students did not complete (20.8%) and 28 students (79.10%). To improve this condition, the researcher took action in cycle II. Improvements can include models and learning processes (Didi, 2021).

Description of Cycle II

The teacher and the twin observers plan class actions based on the identification of the problems found in cycle I, including (1) planning a schedule for implementing the actions in cycle II from 19 October 2019 to 5 November 2019, (2) data on the results of reflections in the first cycle are identified and carried out. planning further actions, (3) making lesson plans, revising learning scenarios by instilling learning experiences and time skills, (4) preparing teaching aids, and (5) preparing research instruments in the form of observation sheets to observe learning activities, questionnaires, and student learning outcomes tests.

The implementation of the action is carried out by (1) carrying out learning activities using a cooperative model of the NHT type following the lesson plans that have been prepared, (2) during the action, student activities are observed both by the researchers themselves and by the observer, (3) after the learning is carried out on the students themselves. Students are given the final test of cycle ii, (4) giving student motivation questionnaires. The implementation of the actions in the second cycle is an improvement from the first cycle (Apriliansa, 2021).

Researchers and observers carried out observations. At the end of the learning process, the researcher conducted a final test, and the student scores obtained in the second cycle of the final test are shown in the table below. The data is then distributed and presented in Table 3.

Table 3. Final test data in Cycle II

Value range	Category	Frequenc y	Percentage
0-35	Very low	0	0%
36-69	low	0	0%
	Not passed	0	0%
70-79	Fair	12	33,32%
80-89	High	19	54,10 %
90-100	Very high	5	12,58%
	Passed	36	100%
Amount		36	100 %

Based on the data in table 3, it can be seen that the level of student learning outcomes in the second cycle showed quite good results, where the average value of student learning mastery had reached the high category (mastery level (81.75%) while students were in the medium category totaling 12 people (33.32%) as well as in the category of 19 people (54.10%). In comparison, the very high category was five people or 12.58%, which shows a pretty good achievement. Thus, it can be concluded that students' learning outcomes by applying the NHT Cooperative model students complete 100%. And the NHT learning model can increase student activity (Ulfah, 2021).

The NHT-type Cooperative Learning model affects improving the percentage of learning biology. The comparison of the data is presented in Table 4.

Table 4. Comparison of Student Learning Outcomes

Range	Category	Initial	Cycle I	Cycle II
0-35	Very low	0	0%	0%
36-69	low	50%	20,83%	0%
	Not passed	50%	20,83%	0%
70-79	Fair	45,8%	52,08%	33,32%
80-89	High	4,20%	27,09	54,10 %
90-100	Very high	0%	0%	12,58%
	Passed	50%	79,10%	100%
Amount		100%	100%	100 %

Based on the data between cycles shown in table 4, we can see that the number of students who obtained the very high category experienced an increase from none in the initial conditions and cycle I, while in cycle two, it became 12.58%. Likewise, students who obtained high scores in the initial condition were 4.10% to 27.09% in the first cycle and increased again to 54.10% in the second cycle, while the students who obtained moderate scores were 45.8% in the initial conditions to 52, 08% in the first cycle, still in the second cycle it was reduced to 33.32%. Similarly, students who got very low scores of 50% in the initial conditions were reduced to 20.83% in the first cycle and 0% in the second cycle, and all students were in a complete state. This shows an increase in learning achievement with the application of the NHT type of Cooperative Learning model.

The Numbered Heads Together (NHT) cooperative learning model can improve student learning outcomes, which can be seen from the increase in the average grade of the first cycle to the second cycle. This happens because there are discussions and direct questions and answers

(Mudana, 2017). The NHT model can include various student learning activities, such as answering questions, answering, taking notes, asking questions, formulating problems, analyzing, drawing conclusions, and expressing opinions (Suprihati & Haniyah, 2012).

The NHT learning model is a model that is carried out with group discussions and involves students' individual abilities in the success of the group. All group members must know the learning procedure because those who represent the group in presenting the group's answers are randomly assigned to their head by the researcher, without the previous students knowing (Fitrianti, 2021). The various advantages of the learning stages cause the application of the NHT model also to improve student learning outcomes and activities in each cycle (ETP et al., 2014; Nouke, 2017).

CONCLUSION

Learning using the NHT Cooperative Learning Model can improve student achievement in Biology subjects in class XI IPA I SMA N 10 Medan semester I TP 2019/2020, as evidenced by the increasing number of students who have completed learning from 50% in the initial conditions to 79.10 % in the first cycle and increased to 100% in the second cycle. Students' activeness in participating in Biology learning is increasing, marked by the presence of students and more and more students who are actively involved in solving problems through group discussions and questions and answers between students and with the teacher.

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