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Student Responses to The Application of The Number Head Together Learning Model in Physics Subjects

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Abstract

The NHT (Number Head Together) learning model is a learning model that has a structure designed to influence student interaction patterns. The NHT learning model emphasizes students to work together in finding, processing, and reporting information. This model can make students more communicative during the physics learning process. The use of conventional learning models will generally make students bored and uninterested in learning physics. In physics subjects, teachers generally use conventional learning models. Students' boredom will arise when learning using conventional models. The purpose of this study was to describe students' responses to the application of the NHT type cooperative learning model. The benefit of this research is to know the student's response to the application of the NHT type of cooperative learning model, as well as the application of the NHT type of cooperative learning model in physics learning. This study used a mixed method search design. The data in this study were analyzed using the triangulation method. Data were collected through interviews, observation, and documentation. The subjects in this study were high school students. The results showed that some respondents responded quite well to the application of the NHT type of cooperative learning model in physics learning, and some of them responded well to the application of the NHT type of cooperative learning. In learning physics, the use of learning models affects the continuity of the teaching and learning process which will have an impact on the knowledge and learning outcomes possessed by students.

Keywords: cooperative, NHT, physics

INTRODUCTION

Education is the most important pillar of a nation (Astalini, Kurniawan & Sumaryanti, 2018). One effort to improve the quality of education is the learning process. Defines education as a conscious effort to grow and develop human resources, not least in the field of education. This opinion is in line with Pransiska, Asyhar & Asrial (2016), that the learning process is pursued through discussion, group work, and others in education, there is such are two things that cannot be separated and are closely interrelated in educational activities (Pane & Dasopang, 2017). Learning is a change in

behavior both observable and non-observable (Gasong, 2018). The process of learning and learning is a communication process to convey messages from the introduction to the recipient (Muhson, 2010).

Before reaching higher education, high school education is needed. SMA (senior high school) is an education level that must be taken, before proceeding to a higher level of education (Astalini, Kurniawan, Perdana & Pathoni, 2019). At the high school level, students are required to learn various fields of science, including physics.

Physics is a lesson that provides knowledge about the natural surroundings and requires students to develop their reasoning (Supardi, Bonard, Suhendri, & Rismurdiyati, 2012). The purpose of learning physics is to develop students' knowledge, understanding, and analytical skills to the environment and surroundings (Azizah, Yuliaty

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& Latifah, 2015). The purpose of learning physics is to deliver students to develop experiences to formulate problems (Kulsum & Nugroho, 2014). Some students view physics positively and some who view physics negatively (Astuti, 2015). For this reason, an effort is needed to attract the interest of all students, namely the use of appropriate learning models. the use of learning models will affect the ongoing teaching and learning process (Zakaria & Ikhsan, 2007).

Based on interviews conducted with physics teachers at Muaro Jambi High School on March 5, 2020, information was obtained that during the physics learning process, teachers tend to use lecture learning models. Besides, the low interest of students in learning physics also makes teachers difficult in teaching physics lessons to students, so that makes learning centered on the teacher.

Teacher-centered learning is learning that does not pay attention to the completeness of individual student learning (Kunandar, 2011). It can be said that this learning only flows information from the teacher to the students. That way, learning in the class will develop determined by the role of the teacher alone (Kumaladewi, Asrial & Hariyad, 2015). The teacher's role is to help students in solving problems and achieving learning goals (Sudana & Wesnawa, 2017),

Several cooperative learning models have been used successfully in a variety of classroom settings (Ellet, 1993). The roots of NHT are grounded in the practice of cooperative learning (Hunter, Dieker & Whitney, 2016). The types of cooperative learning models include the NHT type. The cooperative learning model is a model based on the theory of constructivism (Herawati, Wahyuni & Concern, 2014). So, this model can make students actively involved during the learning process (Solikhah & Buditjahjanto, 2013). It can also be said that the NHT type of cooperative learning model is a type of structured group learning. According to Lagur, Makur & Ramda (2018: 365), the communication skills of students who apply the NHT type of cooperative learning model are higher than the communication skills of students who teach with the direct learning model. In other

words, communication can be said that the cooperative learning model type NHT is able to improve students' abilities in learning.

According to Al-Tabany (2017), the steps or syntax in NHT learning as presented in Table 1.

Table 1. The syntax of NHT type cooperative learning models

Step	Behavior
Step 1 (numbering)	Divide students into groups of 3-5 people and each group member is given a number between 1 and 5
Step 2 (Asking question)	The teacher asks a question to students
Step 3 (Thinking together)	Students unite their opinions on the answer to that question and make sure each member in his team knows the answer
Step 4 (Answering)	The teacher calls a certain number, then the student whose number matches his hand and tries to answer the question for the whole class

The explanation above shows that the application of the NHT type cooperative learning model needs to be done in physics subjects. Based on this, it is necessary to explain the research to describe the responses of Muaro Jambi State High School, 3 students, to physics learning using the NHT type of cooperative learning model. Thus, the study was held with the title "Students Response to The Application of NHT Learning Models in Physics Students"

The purpose of this study was to describe students' responses to the application of the NHT type cooperative learning model.

METHOD

The research is a type of parallel-convergent mixed-methods research. Mixed methods data collection strategies are those that are explicitly

designed to combine elements of one method (Axinn & Pearce, 2006). The point is that the mixed data collection strategy is a strategy that combines the two techniques of a method. In this study, researchers combine qualitative and quantitative research. As for the data collection instruments using the triangulation method. The triangulation method was done by comparing data collected through interviews, observation, and documentation methods.

Interviews use semi structured interviews where the implementation is freer to find problems openly, where the interviewee is asked for his opinion and ideas about the implementation of observations. Researchers use this type of unstructured observation because researchers can conduct research freely, note what is interesting, analyze then conclude.

For qualitative research, the technique used was an interview with an interview sheet instrument. Whereas quantitative research data are collected using a questionnaire instrument. A questionnaire is a list of questions that are used as researchers to obtain data directly from sources (Istijanto, 2005). The indicators of communication skills that are measured are enjoyment, understanding of concepts, application of attitudes and scientific methods, motivation, response. The questionnaire instrument that researchers used was an instrument adapted from the Sari (2012) by changing the name of the model used. The questionnaire uses a Likert scale. The Likert scale is a psychometric scale that is commonly used in questionnaires, respondents' ratings are determined by the level of respondents' approval of questions (Much, Subroto, Farisa, & Haviana, 2016).

The alternatives used by researchers for positive statements are alternatives of strongly agree (SS) with point 5, agree (S) with point 4, neutral (N) with point 3, disagree (TS) with point 2, and strongly disagree with point 1. As for the alternative negative statement that strongly agrees (SS) with point 1, agree (S) with point 2, neutral (N) with point 3, disagree (TS) with point 4, and strongly disagree with point 5.

This research was conducted at Muaro Jambi State High School 3. Samples from this study were taken by looking at and considering the average MID semester scores in physics learning. The number of samples in this study was 20 people. The analysis technique used for quantitative data is a descriptive statistical analysis using the SPSS 25 application. As for the interview data analysis technique regarding the use of the NHT learning model using data analysis using the Analysis Interactive model from Miles and Huberman.

The data analysis steps used the miles and Huberman interactive model, namely:

- 1) Data condensation

This data condensation process is obtained after the researcher conducts interviews and obtains written data in the field, which will then be sorted out to get the research focus needed by the researcher.

In this study, researchers interviewed several students. The results of the interview are then presented in text form.

- 2) Presentation of Data

The presentation of data is organizing, unifying, and summarized information. The presentation of data helps in understanding the context of the research for doing the analysis more profoundly.

Data in the form of text are then presented and summarized to find the focus of the study.

- 3) Conclusion Withdrawal

Drawing conclusions is carried out by the researcher from the beginning, the researcher collects data such as looking for understandings that do not have a pattern, noting the regularity of explanations, and the flow of cause and effect, which in the final stage is concluded by all the data by the researcher.

The final step is to draw conclusions from the data previously presented.

RESULT AND DISCUSSION

The renewal of this study to review the implementation of the NHT type cooperative model in physics learning toward student's responses during the physics learning process in senior high school.

The syntax of the NHT learning model that is implemented consists of 4 stages, namely numbering, questioning, head together, and (answering). This learning model is usually used in training student communication skills (Wardah & Nasrudin, 2020).

The NHT learning model is a group learning model that involves students actively in learning activities by giving numbers to students

which aims to improve social skills, namely communication skills. Question and opinion communication skills can be trained in the Head Together and Answering stages. At this stage students can ask and argue that students can dominate the learning process, where the teacher only points to one number that represents the group to answer the questions given by the teacher without first knowing who will represent the group, so that each member is responsible for answering questions from the teacher (Novianti & Muchlis, 2020).

The results of the statistical analysis obtained about students' responses to the application of the NHT type cooperative learning model in physics subjects can be seen in table 2

Table 2. The Response of Students of Class X Science 4 of SMAN 3 Muaro Jambi to Learning Physics Using The NHT Type of Cooperative Learning Model

Characteristics					The Mean	The Median	Min	Max
The Interval	Category	Frequency	Percentage (%)					
20.0-36.0	Very Not Good	0	0					
36.1-52.0	Not Good	0	0					
52.1-68.0	Pretty Good	10	50		67.3	68.5	55	79
68.1-84.0	Well	10	50					
84.1-100	Very Good	0	0					
Total		20	100					

The response given by students will certainly affect the continuity of the learning process and affect the learning outcomes of students. In table 2 for students' responses to the application of the NHT type of cooperative learning models in physics class X science, 4 subjects in Muaro Jambi State High School 3 is good with consideration of the average value of 68.5.

The following is the documentation during the interview who responded reasonably well to the application of the NHT type of cooperative learning model.



Figure 1. Interview with student

Students who responded reasonably well to the application of the NHT type of cooperative learning model were 50% (10 out of 20 respondents). This result is supported by the following interview results:

Question: is the NHT type of cooperative learning model more useful and makes you skilled in learning physics?

Answer: This learning model is quite useful and makes me skilled, but I do not have a turn to answer the question.

Question: does learning physics using the NHT type of cooperative learning model make you sleepy during the learning process?

Answer: no. Because the use of head numbers makes learning like fun.

Question: does learning physics using a cooperative learning model make you more motivated?

Answer: A little, because there is a possibility, I am not called to answer the question so sometimes I am lazy.

Furthermore, there are 50³⁸ (10 out of 20 respondents) who responded well to the use of the NHT learning cooperative model. This result is supported by the following interview results:

Question: is the NHT type of cooperative learning model more useful and makes you skilled in learning physics?

Answer: Yes, because when learning to use the cooperative learning model me and a group friend are required to be able to collaborate and work together.

Question: does learning physics using the NHT type of cooperative learning model make you sleepy during the learning process?

Answer: no. Because if I'm sleepy, it could be at any time my number is called.

Question: does learning physics using NHT type cooperative learning models make you more motivated?

Answer: of course. Because the use of the NHT type of cooperative learning model makes me more active in learning with

26 ne group of friends and other friends.

Based on the results of descriptive statistics and answers provided by students at the interview, students' responses to the application of the NHT type of cooperative learning model are quite good and good. The diversity of responses

given by these students according to the Syah (2013), influenced by:

a. Internal factors

It is a factor in the participants, in the form of physiological (physical) and psychological (spiritual) aspects. Physiological aspects such as eyes, ears, feet, and others. While psychological aspects such as intelligence, thought, interest, and motivation.

b. External factors

It is a factor from outside the¹⁰ students themselves, namely in the form of social and non-social environmental factors. Social environmental factors such as family, teacher, community, friends. while non-social factors include home, school, equipment, and nature.

Hadi & Kasum (2015), said that the use of inappropriate learning models will affect the sustainability of the learning process. A learning model is needed that can²⁷ attract the interest and attention of students. One learning model that can be used is the cooperative learning model. that From³ the opinion of experts, it can be concluded that cooperative learning is a form of learning employing students learning and cooperating in small groups collaboratively whose members consist of four to five students with heterogeneous group structures (Jamalong, 2012). The cooperative learning model is a model of group learning (Rahman, Ahmar & Rusli, 2016). Groups in cooperative learning consist of four to six heterogeneous learners (Majid, 2014). The group learning model is cooperation which is a positive attitude and can improve learning outcomes (Putri, Maison & Darmaji, 2018).

One learning model that can make learning centered on students is the cooperative learning model. Cooperative learning is learning that trains students to work together (Nugroho, Hartono & Edi, 2009). The important thing in the cooperative learning model is social interaction (Uno & Muhammad, 2011). Because ultimately the learning process⁴ will take place in groups (Suhardi-yanto 2009). Cooperative learning models are developed to achieve learning outcomes in the form of academic achievement, tolerance, accept-

ing diversity, and developing skills (Suprijono, 2009).

The cooperative learning model is a model that instills more concepts to collaborate with students (Trianto, 2009). That way, through cooperative learning students, will discuss and help each other in understanding learning material so that it will achieve mastery learning (Pujiasri, 2018). In cooperative learning, two or more individuals will depend on one another to achieve their goals (Sholikhah & Budjahanto 2013). The cooperative learning model has several variations including Student Teams Achievement Division (STAD), Numbered Head Together (NHT), Think Pair Share (TPS), and Jigsaw. Variations in the learning model need to be applied and analyzed the effectiveness of learning (Sipayung, Simanjuntak, 2018).

One type of cooperative learning is the NHT (number head together) type. The NHT (number head together) type of cooperative learning model is a learning model that emphasizes specific structures to influence patterns of interaction between students (Siregar, 2012). The NHT type of cooperative learning model has several advantages and disadvantages. As for the advantages of the NHT type cooperative learning model according to Yudiastuti, Wiarta & Ardana (2014), which can foster student learning outcomes, be able to deepen students' understanding, please students in learning, develop students' positive attitudes and student leadership attitudes and develop curiosity the student. Increase students' confidence and develop mutual ownership.

NHT model type cooperative learning will make every student ready to understand the material lessons well, emphasize the activeness of students, requires a good basis (Asrianil, Tellu, & Suherman, 2020). So, students able to distribute information and improve skill communicating. Discussion formation in the NHT type cooperative learning group (Numbered Head Together) is expected can grow and develop a high social sense in every student, because they are scouted to control a sense of selfishness that exists in each of them. So that, fostered solidarity social. Positive

competition occurs between students in class in the context of achieving optimal learning (Darmanik, Panjaitan, & Simangunsong, 2020). This is the expect active students, creative, and independent Learning with the NHT model give students more time to discuss in their groups and students can exchange ideas with each other. Learning to use NHT has more active in looking for things that are not yet understood, one of them when students write answers to the results of group work, each student may not be able to understand written answers (Setyawati, Anwar, Maslikhah, 2020).

The advantages of the NHT type cooperative model according to Karya, Kanca & Setiawan (2016), a this model causes students to be fully involved in the learning process, it can increase the sense of responsibility of individual students in groups, allow students to share ideas and consider the most appropriate answers, encourage students to increase the spirit of cooperation, smart students can teach students who are not smart. Weaknesses in the use of NHT type cooperative learning models are the number called will likely be called again by the teacher, not all group members are called by the teacher (Alie (2013).

This learning model can help students to play actively in learning because it is capable of fishing for power students' creativity in understanding the concept learning. NHT model has characteristics where the teacher only appoints a student to represent the group without telling in advance who will represent the group it. So, this model guarantees the total involvement of all participants students.

CONCLUSION

From the results of research conducted that the application of the NHT type of cooperative learning models in physics subjects is responded by a variety of students. The results showed 0% of students who responded very poorly, 0% of students responded poorly, 50 % of students (10 out of 20 respondents) responded fairly well, 50 %

of students (10 out of 20 respondents) respond well, and 0% of students respond very well. The use of learning models affects the sustainability of the teaching and learning process. Where the latter will have an impact on knowledge and learning outcomes of students. Suggestions for schools are to give more innovation to the learning model used, both in physics and other subjects.

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