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Advantages and Disadvantages of Applying the NHT Type Cooperative Learning Model Physics Learning in School

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Abstract

This study analyses the advantages and disadvantages of cooperative learning type Numbered Head Together (NHT). The method in this research is a literature study based on previous research. The analysis technique used in this research is descriptive qualitative obtained from books and journals. Based on literature from 26 articles in scientific journals, it was found that the advantages of this type of NHT cooperative learning model are to make students more active, make students more interested in learning, think critically and responsibly and can improve student learning outcomes. While the obstacle in this learning model is the lack of time management) so that not all students can present the results of the discussions obtained during the learning process.

Keyword: Advantages; Disadvantages; NHT

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INTRODUCTION

Physics is a collection of knowledge that significantly influences the ability to master science and technology (Aslamiyah, Masturi, & Nugroho, 2017). Physics is a collection of knowledge, ways of thinking, and investigation. Physics is seen as a process and, at the same time, a product. Therefore, learning must consider effective and efficient learning strategies or methods (Susanti, Ayub, & Taufik, 2016).

In learning physics, a person is often faced with learning difficulties (Azizah, 2015). Several factors can cause learning difficulties. One of them is the use of learning methods that are not suitable so that the solution that can be given to facilitate understanding of physics concepts is to use cooperative learning models. One of the learning models that can help is the NHT type of cooperative learning model (Subur, 2015).

In cooperative learning, a learning strategy is applied to many students as small groups with different levels of ability (Sanjaya, 2014). In group assignments, each group member must work together and help each other to understand the subject matter. In this learning, learning is said to be incomplete if one of the group's friends has not mastered the learning material (Taniredja, Faridli, & Harmianto, 2014). Cooperative learning has proven to be an effective learning tool for students'

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various characteristics and social backgrounds because it can improve student academic achievement (Warsono & Hariyanto, 2013).

Numbered Head Together (NHT) or numbering thinking together is a type of cooperative learning designed to influence student interaction patterns and as an alternative to traditional classroom structures. Developed by Russ Frank, this type provides opportunities for students to share ideas, consider the most appropriate answers, increase the spirit of student cooperation, and be used for all subjects and grade levels (Huda, 2016). In asking questions to the whole class, the teacher uses a four-phase structure: the numbering phase, the question phase, the thinking phase, the answering phase (Simanjuntak & Soedjito, 2014).

Therefore, based on the problems in learning physics above, the authors are interested in discussing the advantages and disadvantages of the NHT type cooperative learning model because it is considered capable of making students more active, responsible and able to work together between group members learning physics.

METHODS

The research was conducted using the literature study method based on existing research and library sources such as books, archives, old documents, journals, notes, etc. to obtain data (Sani, 2014). It is then managed again into a valid material unit to produce a simpler discussion component for further study. In literature study, there are at least four main characteristics that the author needs to pay attention to, including (a) Authors of direct association with text or numerical data, not with direct knowledge from the field; (b) Library data is "ready to use" means that the author does not go directly into the field because the author is dealing directly with existing data sources in the library; (c) Library data is generally a secondary source, in the sense that the author obtains material or data from second hand and not data from the first in the field; (d) Library data is not limited by time and space (Trianto, 2012). Sources of data in this study include 26 articles from scientific journals.

RESULTS & DISCUSSION

Based on the literature, it is found that the advantages of this type of NHT cooperative learning model are that it can improve student learning outcomes (sourced from 10 articles in accredited and non-accredited national journals); making students more interested in learning (sourced from 2 articles in accredited and non-accredited national journals); make students more active, think critically and responsibly (sourced from 12 articles in accredited and non-accredited national journals). In comparison, this learning model's obstacle is the lack of time management (source from 2 articles in national journals).

Table 1 Research Results

The advantages of the type of learning model are numbered head together		**The Disadvantages of Types of Learning Model Same head number**	
Improve learning outcomes	10 articles	Time problem	2 articles
Make students interested	2 articles		
Students become more active, think critically and be responsible	12 articles		
Total		26 articles	

The learning model is a conceptual framework in the form of a systematic procedure pattern developed based on theory and used in organizing the learning process (Huda, 2016). One of the learning models is cooperative learning (Trianto, 2012). Cooperative learning is a learning strategy through small groups of students who maximize learning conditions to achieve learning goals (Wati & Rini, 2016). In a cooperative learning system, students learn to cooperate with other members to have two responsibilities, namely learning by themselves and helping fellow members learn (Trianto, 2012).

Cooperative learning models have many learning types, one of which is Numbered Head Together (NHT) (Simanjuntak, 2013). Numbered Head Together is an approach developed by Spencer Kagen in 1993 to involve more students in studying the material covered in a lesson and checking their understanding of the lesson's content (Sani, 2014).

There are four steps in its implementation: (a)Numbering, The teacher divides students into groups of 3-5 people, and each group is numbered 1-5; (b) Asking the question, the teacher asks a question to students. The questions may vary. Questions can be particular and take the form of an interrogative sentence such as, "What are the properties of an object?" or in the form of directions such as: "Make sure everyone knows the various properties of objects!"; (c) Think Together, students synthesize their opinions on the answer to that question and make sure the flap team members know the answer; (d) Answer, the teacher calls a certain number then the student whose number matches it must raise a hand and try to answer questions for the whole class (Sani, 2014)

The advantages of the NHT Type Cooperative Learning Model in Physics Learning

The advantage of applying this learning model compared to other learning models is that it improves physics learning outcomes significantly in all cognitive aspects because it provides good benefits to students with varied thinking skills and also provides opportunities for students to exchange ideas and consider the answers obtained (Afta, Sada, & Etiovia, 2016; Basonggo, Darsikin, & Pasaribu, 2019; Batubara & Sinulingga, 2014; Damanik, Panjaitan, & Simangunsong, 2020; Juniar Hutahaean & Ratna, 2014; Mahir, 2015; Nurazizah, Sudarto, & Yunus, 2017; Nurhadisah, Halim, & Khaldun, 2014; Prastiti, 2016; Purnomo, Sinon, & Widyaningsih, 2017; Rasyid, Pasaribu, & Kamaluddin, 2015; Sari, Husna, & Anaperta, 2017; Susanti et al., 2016; Yuli, Sahidu, & Ayub, 2018). The NHT type of cooperative learning makes students more active, able to share and work together (Sari et al., 2017). This model will also make it easier for students to understand concepts if they discuss each other with messages, following the characteristics of this method, namely group discussions (Dewi, Prihandono, & Handayani, 2016; Nurazizah et al., 2017). Besides that, it can also make students creative in the learning process. During the cooperative learning process of the NHT type, student learning activities also increase, as indicated by the increasing number of students who pay attention and listen to the teacher's directions to provide satisfactory learning outcomes (Damanik et al., 2020).

The NHT type can easily support critical thinking processes in students such as identifying problems, providing hypotheses on problems, then analyzing problems and discussing these problems in groups, and students also feel happy when they are directly involved in

learning Simanjuntak & Soedjito, 2014; Susanti et al., 2016). In the numbering step, students in-group members are given different numbers so that students become more responsible for the assigned task; in the step of thinking together (head together), they focus on completing the task (Siregar, 2012). given because this step can be a forum for students to work together to achieve learning objectives in completing academic tasks such as answering questions about the material from the teacher as well as in the step of asking questions (questioning) and giving answers (answering), making each group member will help each other for the success and good name of the group (Mahir, 2015). The application of the NHT type cooperative learning model, which is carried out with the assistance of other media such as student worksheet (student guides to solve a problem in learning), can also improve students creative thinking skills because if media accompany the learning model, it can make students understand more about the lesson (Nor, Suryani, & Zulhelmi, 2009).

The learning model with the NHT type can make students interested and feel that physics learning is not boring, and job training and student activeness in learning (Basonggo et al., 2019; Prastiti, 2016). NHT type cooperative learning also affects students attitudes and knowledge on physics learning; then, when experimental methods accompany the NHT type cooperative learning, it will affect student skills and the development of scientific attitudes (Bektiarso, Haniyah, & Wahyuni, 2014; Hidayah, 2018; Rahmawati, Nugroho, & Putra, 2014). This model's application is also considered to have a good impact on students understanding of physics concepts and scientific communication (Hidayah, 2018; Sari et al., 2017). The NHT type of cooperative learning model can help involve more in reviewing the material to make students appear to be active during the learning process. This can also increase individual responsibility in group discussions (Hakim & Rambe, 2012; Hidayah, 2018; Rasyid et al., 2015; Rofiqoh, Mahardika, & Yushardi., 2015; Sari, Supriatin, & Yuliani, 2015; Setianingrum & Sunarti, 2013)

Constraints of the NHT Type Cooperative Learning Model in Physics Learning

Some of the obstacles experienced in implementing this type of NHT cooperative learning model are the problem of time because time is considered insufficient to complete the learning process (Hidayah, 2018; Nursyamsi, Corebima, & Susilo, 2016; Prastiti, 2016; Rasyid et al., 2015; Susanti et al., 2016). In this application, students are also not used to doing experiments and discussions, making learning less effective (Hutahaean & Ratna, 2014; Prastiti, 2016). So in its implementation, it is suggested to make learning more interesting (Rasyid et al., 2015), and careful planning and preparation are needed before it is implemented in class so that it can run according to the learning objectives to be achieved (Simanjuntak, 2013). More attention is needed to the material and test instruments used in this study, especially for verbal and figural creativity test instruments (Prastiti, 2016).

CONCLUSION

The NHT type cooperative learning model is proven to improve student learning outcomes and attitudes. The advantages of the NHT type of cooperative learning model are that it can make students more active, work together between group members, respect other opinions during discussions, and instil an attitude of responsibility towards oneself. While

the constraints in this learning model are the lack of time management so that not all students can present the discussion results, there are still students who do not pay attention so that they are relaxed with their activities. Some students do not participate in group discussions, and uneven group division is needed division of groups with variations in student abilities.

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