

The Effect of Cooperative Learning Model Type Numbered Heads Together (NHT) Assisted Media Video and Motivation on Natural Science Achievement of Elementary School Students

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Abstract—Numbered Heads Together (NHT) model used a series of delivery of materials by using groups as a container in unifying students perceptions/ minds to questions asked or asked teachers, which will then be accountable by students in accordance with the teachers request number each group. This research aimed to know: the effect of cooperative learning model type NHT assisted video media on students natural science achievement; the effect of motivation students natural science achievement and interaction between learning model and motivation in increasing students natural science achievement. This research was a quasi-experimental research. Instruments in this research were objective test of natural science and questionnaire motivation in learning. Data analysis technique used was two-way Analysis of Variance at significant level alpha 0.05. The results of this research showed that: there was an effect of cooperative learning model type NHT assisted video media on students natural science achievement, with value of significant 0.000; there was effect of motivation on students natural science achievement, with value of significant 0,000 and there was an interaction between learning model and motivation in increasing students natural science achievement with value of significant 0.031.

Keywords—Cooperative learning model; motivation; natural science achievement

I. INTRODUCTION

Basically Natural Science is a way of finding out about nature systematically to master the collection of knowledge in the form of facts, concepts, principles, process of discovery and have a scientific attitude. Science and science lesson are

not just scientific knowledge, but there are a charge of natural science, process skills and dimensions that focus on the characteristics of scientific attitude and character.

Various problems in the implementation of science education in accordance with the nature is very complex, because the thoughts are still being donated to solve the problem. The fundamental problem is that science learning has not been oriented to the skills of the whole scientific process so that the ability to think and investigation ability has not been optimal. The consequences of such learning products are the decreasing ability of critical and creative thinking. This will shape the consumerist generation and not globally competitive.

Based on observations the researcher did on August 30 and September 01 in public elementary school 060856 Medan in natural science, it appeared that the application of various models of cooperative learning has not been done, teachers tend to used conventional method that was by way of lectures so that the student activity was less active and this condition were seen many students are passive and did the excercises that are in the book. Beside that, the students are less motivated in following the lesson so the students' curiosity was low on the material being taught.

In accordance with the reality in the field, the low learning outcomes of students in elementary school 060856 Medan, also against the lack of involvement of students in the learning process. This was influenced by internal and external factors. In addition, one of the factors causing low learning outcomes of students in science subjects was the method of teaching and

motivation given by the teacher to students less relevant with the characteristics of students. Teachers also lack emphasis on students to reason, to find the relevance of subject matter, communicate, and solve problems, so there were no time for students to develop effective learning strategies. This was evident from the results of the average score of natural science students during the last three years in grade five in public elementary school 060856 Medan was still under minimum completeness criteria. Terms completeness minimum completeness criteria in public elementary school 060856 the terrain is seventy. This proves that the value of students were still low. Therefore, to be able to develop or improve students' skills both in understanding and motivation to learn, and reduce the passivity of students in science learning, so that teachers need to use variations of learning models that can involve students actively in the learning process. One way that can actively involve students and to improve student learning outcomes is the cooperative learning model type NHT. The cooperative learning model type NHT is a series of delivery of materials by using groups as a container in unifying students' perceptions thoughts on questions asked or asked by teachers, which will then be accountable by students according to teachers request number from each group [1]. The cooperative learning model type NHT provides an opportunity for students to share ideas and consider the most appropriate answer [2]. In addition, this technique also encourages students to improve their morale of cooperation and this model of learning is more emphasis on student activity in searching, processing and reporting information from various sources that eventually presented in front of the class.

To avoid the boredom of students in learning and enthusiastic in following the lesson, then the teacher needs to use the learning media in teaching and learning process. One of the learning media is video media. The video describes the real state of a process, phenomenon or event so as to enrich the exposure [3]. The video capability of painting live and sound images provides its own charm. Videos can present information, describe processes, explain complex concepts, teach skills, abbreviate or prolong the time, and influence attitudes.

From the above description, the researcher was interested to further research under the title " The Effect of Cooperative Learning Model Type Numbered Heads Together (NHT) Assisted Media Video and Motivation on Natural Science Achievement of Elementary School Student".

This research aimed to know: the effect of cooperative learning model type NHT assisted video media on students natural science achievement; the effect of motivation students natural science achievement and interaction between learning model and motivation in increasing students natural science achievement.

II. METHOD

This research was conducted at public elementary school 060856 Medan, which was located at Rakyat street, Number 30, District of Medan Perjuangan. The population of this study were all students of class V public elementary school 060856 Medan, which consists of two classes, namely grade five-A, and grade five-B, amounting to 60 people. The sample in this research was grade five-A, and grade five-B. Sampling technique in this research used Total Sampling. Grade five-B as an experimental class taught by cooperative learning model type Numbered Heads Together (NHT) assisted media video with the number of students 30 people. As for the control class was taught with Direct Instruction (DI) assisted media picture selected grade five-A with the number of students as many as 30 people.

The independent variable in this research was cooperative learning model type NHT assisted media video and model DI assisted media picture. The moderator variable used was the motivation in learning which was distinguished between high motivation and low motivation. While the dependent variable in this student achievement of natural science.

This research used quasi experiment method. In this research, the effect of treatment was analyzed by 2 x 2 factorial design with 2 lane variance analysis (ANAVA) technique, as in the table below.

TABLE 1. ANOVA RESEARCH DESIGN 2 X 2

Motivation in Learning (B)	Learning Model (A)		Average
	DI Assisted Media Picture (A ₁)	NHT Assisted Media Video (A ₂)	
High (B ₁)	A ₁ B ₁	A ₂ B ₁	μB ₁
Low (B ₂)	A ₁ B ₂	A ₂ B ₂	μB ₂
Average	μA ₁	μA ₂	

The hypothesis of this research was there was effect of cooperative learning model type NHT assisted video media on student achievement of natural science, there was effect of motivation in learning on student achievement of natural science, there was an interaction between learning model and motivation in learning on students achievement of natural science.

Hypothesis tested of this research was conducted by used two-way Variance Analysis (ANAVA) at significance level $\alpha = 0.05$ used univariate General Linear Model (GLM) test with SPSS version 22 for windows.

III. RESULT

The results obtained in this study include learning scores and questionnaires of students' motivation in learning in the experimental class taught by cooperative learning model type NHT assisted video media and in control class with model DI assisted media picture Natural Events Disaster materials.

TABLE 2. PRETES AND POSTES STUDENT LEARNING RESULTS

Class	N	Average	Average
Experiment	30	44.40	82.00
Control	30	42.67	72.27

Table 2 above, showed that the average pretest of students learning outcomes of both classes has the same initial ability. From the mean data of the students postes in the second grade of the class showed that there were data of student learning result that was taught with cooperative learning model type NHT assisted media video was higher than the mean of students achievement which was taught by model DI assisted media picture.

Terms of data analysis with parametric statistics was assumption test or prerequisite. In order for later data of research result can be analyzed with parametrik statistic, so need to do normality test and homogeneity test. .

TABLE 3. NORMALITY AND HOMOGENEITY PRETEST DATA

Class	N	Kolmogorov-Smirnov ^a			Levene	
		Statistic	df	Sig.	F	Sig.
Experiment	32	0.118	30	0.200	0.126	0.724
Control	30	0.135	30	0.172		

Based on the normality of pretest data in Table 3, significant value in Kolmogorov-Smirnov was greater than 0.05 in the experimental and control classes. This result indicated that data in both classes was normal. Then the homogeneity of pretest data showed significant value greater than 0.05, so the two classes was homogeneous.

TABLE 4. NORMALITY AND HOMOGENEITY DATA POSTES

Class	N	Kolmogorov-Smirnov ^a			Levene	
		Statistic	df	Sig.	F	Sig.
Experiment	32	0.134	30	0.182	2.556	0.115
Control	30	0.091	30	0.200		

Based on the normality of postes data in Table 4, significant values in Kolmogorov-Smirnov were greater than 0.05 in the experimental and control classes. These results indicated that data in both classes was normal. Then the homogeneity of pretest data showed significant value greater than 0.05, so the two classes was homogeneous.

Based on the data division of high motivation groups and low motivation, then the data of student achievement was grouped accorded to the motivation data. Grouping was done based on the ideal score of motivation of all students. The purpose of grouped were to see student achievement that have high motivation and low motivation.

TABLE 5. GROUP POSTES VALUE OF STUDENTS BASED ON MOTIVATION LEVEL

Group	N	Average
High Motivation	41	84.46
Low Motivation	19	67.79

Based on table 5 above, it can was explained that the average student achievement who have high motivation higher than the average results of students who have low motivation.

TABLE 6. STUDENT POSTES VALUE BASED ON MOTIVATION LEVEL IN EXPERIMENT CLASS (NHT)

Group	N	Average
High Motivation	19	86.11
Low Motivation	11	74.91

TABLE 7. STUDENT POSTES VALUE BASED ON MOTIVATION LEVEL ON CONTROL CLASS (DI)

Group	N	Average
High Motivation	22	77.45
Low Motivation	8	58.00

Based on table 6 and table 7 above, it can was explained that the average of student achievement in the NHT class with the help of video media was higher than the class of DI assisted picture media both in high and low motivation categories.

After the data collected and analyzed statistics, then performed hypothesis tested. This hypothesis test used two-track ANAVA test which calculated by SPSS 22 for windows. From the test data obtained learning results, calculated the average of each group and then compiled as two-lane ANAVA table.

TABLE 8. ANAVA 2 X 2

Motivation	Average Learning Outcomes		Average
	DI (Picture Media)	NHT (Media Video)	
High	77,45	86,11	81,46
Low	58,00	74,91	67,79
Average	72.27	82.00	

To see the difference of motivation and student achievement to the learning given, two way Anova test is used by selecting General Linear Model (GLM) univariate on SPSS 22. This test also aimed to see how the influenced of motivation on student achievement, whether students with high motivation have high learning outcomes or vice versa, and whether there was interaction between learning model and motivation in influenced student achievement.

TABLE 9. TWO PATH LINES ANAVA TEST RESULTS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Learning model	2080,617	1	2080,617	46,678	,000
Motivation	2991,977	1	2991,977	67,124	,000
Learning Model * Motivation	217,203	1	217,203	4,873	,031
Total		60			

The data in table 9 above, was used to test the hypotheses proposed in this study. The following was a description of the results of the hypothesis test.

1. First Hypothesis

Based on the results of Anava in table 9, obtained value of learning model significance of 0.000 because sig. $0.000 < 0.05$ then the hypothesis tested results rejected H_0 or received H_a in the level of 5% alpha. This showed that there was an effect of cooperative learning model type NHT assisted video media on students achievement of natural science.

2. Second Hypothesis

Based on the results of Anava in table 9, obtained significance value of learning motivation of 0.000 because sig. $0.000 < 0.05$ then the hypothesis tested results rejected H_0 or received H_a in the level of 5% alpha. This showed that there was an effect of motivation in learning on students achievement of natural science.

3. Third Hypothesis

Based on the results of Anava in table 9, obtained value significance learning model of students motivation in learning of 0.031 because sig. $0.031 < 0.05$ then the hypothesis tested results reject H_0 or receive H_a in the level of alpha 5%. This showed that there was an interaction between learning model and motivation in learning on students achievement of natural science.

The result of interaction between learning model with motivation in influencing students achievement can be presented in graphic form in picture 1, below this.

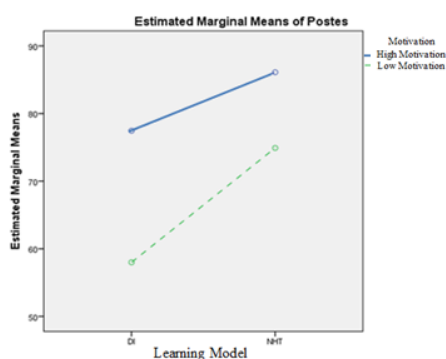


Fig. 1. Interaction chart of DI and NHT learning model with motivation

Based on the above graph, can be explained in the class DI motivation was more dominant in influenced the student achievement of natural science, whereas in the NHT class was more dominant model in influenced the student achievement of natural science. Achievement of natural science students was optimal in students who were taught with NHT learning models for high motivation.

IV. DISCUSSION

Based on the data analysis, the result of the research showed that the students who were taught by cooperative learning model NHT assisted video media get better grade than the students taught by model DI assisted picture media. In addition, the result of variance analysis showed that the significance value of learning model was 0.000 because sig. $0.000 < 0.05$ then the hypothesis tested results reject H_0 or receive H_a in the level of alpha 5%. This showed that there was a significant influenced of cooperative learning model of NHT type assisted video media on student achievement of natural science. In the NHT learning model there was a significant increase in learning outcomes in the cognitive, affective and psychomotor fields [4].

In addition to the results of variance analysis, the results of the study can also be seen from the difference in postes average in both classes. The mean postes of the students in the class were taught with model NHT assisted video media of 82.00 while in the model DI assisted picture media was 72.27. From these data indicated that students learning outcomes taught with NHT model assisted video media was higher than mean of student achievement taught with DI model assisted picture media. The NHT model provides students with the opportunity to discover their own knowledge through group discussions and solve problems within the group. The teacher facilitates and guides the students in a quiet and comfortable state [5]. At the time of numbered phases, students were very enthusiastic about learning in groups and used numbers on their heads. Students felt they had more responsibility and had a serious discussion so that group discussion activities run well. Next phase of thinking together, students unite their opinions on the answers to questions contained in the students worksheet. All students were actively involved in conducted group discussions. In the answering phase, students were trained to dare to communicate the results of the discussion so that to enhance their communication skills [6]. The model NHT can help students to come to thinking in problem solving situations and there was an integrated concept understanding through discussion (exchange of information) in the group as well as corrections by other teams when a team did classroom assignments [7]. The numbered phases in the NHT model allowed the students to be ready for lessons, as each student has the same opportunity [8]. The NHT learning process was more capable of generating an interesting learning environment and more interaction within the group during the learning process [9]. The sense of community that was embedded in NHT learning leads the students in each group to feel interdependent with each other, the success of one person is the success of each member of the group [10]. The NHT model can make students active in follow the learning process

and not afraid to express or ask questions, so that the learning process can work effectively and fun [11].

Based on the results of the study proved that the average student achievement who had high motivation of 81.46 higher than the results of students who had low motivation of 67.79. In addition, the results of variance analysis indicate that the significant value of motivation in learning was 0.000. Because $\text{sig. } 0.000 < 0,05$ then result of hypothesis tested reject H_0 or accept H_a in level of alpha 5%. This showed that there were differences in natural science student achievement who had high motivation in learning with students who had low motivation in learning. Motivation encourages effort and learning achievement [12]. The existence of a good motivation in learning will showed good results. This showed that there were differences in natural science student achievement who have high motivation in learning with students who have low motivation in learning. Motivation to learn affects the learning activities and student achievement. Students with great motivation will work hard, seem persistent, do not want to give up, and diligently read to improve achievement and solve problems it faces [13]. Learning motivation gives a significant influenced on the improvement of learning achievement. Students who were motivated to learn will always appear active in the class and dare to express their opinions, and were able to respond to the problems it faces [14]. Students have motivation in learning, then the learning achievement will be good (high). Conversely, if students have bad habits in learning, then the learning achievement will be bad (low) [15]. So students who have high motivation in learning will better understand or master the material taught so that the results of learning was better than students who have low motivation in learning.

This study found the students achievement of natural science that varied between the NHT model assisted video media and model DI assisted media picture with high motivation in learning and low motivation in learning. Based on the result of variance analysis showed that the significance value of learning model interaction with student's motivation in learning was 0.031 because $\text{sig. } 0.031 < 0.05$ then the hypothesis tested results reject H_0 or receive H_a in the level of alpha 5%. This showed that there was an interaction between learning model and motivation in learning on students achievement of natural science. The results of this study also provide an illustration that the students achievement who have high motivation to obtain higher students achievement than low motivation students both taught by learning model NHT assisted video media and model DI assisted media picture.

VI. CONCLUSION

Based on the result of the research, it can be concluded that there was the effect of cooperative learning model type NHT assisted video media on students achievement of natural science. This proved through calculations that showed significant differences on student achievement between students taught with the learning model NHT assisted video media and model DI assisted media picture. There was an effect of motivation in learning on student achievement of

natural science. This was evident through the calculation of average student achievement who have high motivation was better than student achievement who have low motivation. There was an interaction between the learning model and the motivation in learning influenced on student achievement of natural science. In the interaction in class DI motivation more dominant in influenced on student achievement of natural science, whereas the more dominant NHT class model in affected on student achievement of natural science. Achievement of natural science students were optimal in students who were taught with NHT learning models for high motivation.

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