

The Effect of Cooperative Type Number Heads Together and Concept Mapping Learning Models on Student's Learning Activity and Student Learning Outcomes in Class V Science Study of SD Negeri 11 Rantau Selatan

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Abstract

One of the lessons that make students more active is cooperative learning. Cooperative learning is a way of learning in which students of all abilities work together in small groups to achieve goals. This model prioritizes student-centred learning and students can interact with their friends in solving problems. The cooperative model has several types, including the cooperative model, Number Head Together. Concept Mapping was first developed by Tony Buzan, a mathematician, psychologist and researcher. Concept Mapping helps students to improve learning outcomes. Sampling using purposive sampling technique. while the sample in the study consisted of 2 classes, namely class 5 a as the experimental class 1 for Testing the Effect of the Cooperative Learning Model type Number Head Together and Concept Mapping on Student Learning Activities and Outcomes, and Class V b as the experimental class 2. The Cooperative Learning Model Type Number Head Together and the Concept Mapping Learning Model have a significant effect on Learning Activeness and Student Learning Outcomes in Class V Science Subjects at SD Negeri 11 Rantau Selatan. However, when analysed on the aspect of a stronger influence on Activities and Learning Outcomes, based on the results of the above calculations, it is obtained data that the Concept Mapping Learning Model has a stronger effect on student learning activeness compared to learning outcomes in science subjects. The Number Head Together Learning Model has a stronger influence on the results than the student learning activity in science learning materials.

Keywords

cooperative learning
model type number
head together;
concept mapping;
learning outcomes;
student learning
activities



I. Introduction

The orientation to the success of education in schools is currently dominated by the evaluation of intellectual intelligence, not emotional intelligence. This shows that if the written test score is good, the student is considered a child who has succeeded in the lesson (achievement) even though it is obtained with the wrong score. But success in human life is not only determined by high mental intelligence, but also supported by emotional intelligence, careful intelligence. This refers to the opinion of Goleman (2003:12) that the percentage contribution of IQ in supporting one's success is no more than 20%, the remaining 80% is supported by other factors, including emotional intelligence. Furthermore, a study conducted by Goleman (2004:27) shows that the role of IQ in a

person's success only ranks second after emotional intelligence in determining the achievement of peak performance in work. The learning process does not take place separately from the learner's feelings (emotions). In the learning process, emotional skills are just as important as learning material and reading instructions. The emotional brain is just as involved in thinking as the reasoning brain is. In a sense we have two brains, two minds and two different intelligences: rational intelligence and emotional intelligence. Goleman also emphasized that a person's success in life is determined by both not only intellectual intelligence, but also emotional intelligence. Thus, intellectuality cannot work at its best without emotional intelligence.

The student outcomes referred to here include: initial abilities, motivation and learning styles. Susanto (2013: 38) states that learning styles are the key to developing performance at work, at school and in interpersonal situations. Furthermore, Susanto also stated that there are three kinds of student learning styles, namely visual, auditory, and kinesthetics learning styles. Salovey and Mayer in Zubaedi (2011: 87) state that learning outcomes are a subset of social intelligence related to a person's ability to monitor both his or her emotions with the emotions of others, and also the ability to distinguish one's emotions from those of others, where this ability it uses to direct thought patterns and outcomes. Students who have high emotions will have better learning outcomes than students who have low emotions. Furthermore, the research results of Ogundokun and Adeyemo in Mulyo Rahardjo and Daryanto (2012: 51) show that student learning outcomes have a significant relationship with academic achievement.

Starting from observations made in Class V SD Negeri 11 Rantau Selatan, researchers found several causes for differences in student learning activity. One of them is the lack of effectiveness of students in the learning process used by the teacher in conveying material that is still conventional, namely still using the lecture method, and giving assignments, the teacher feels that the learning that has been designed so far is good enough so that it causes the teacher to feel reluctant to carry out reforms related to models and strategies which can improve student learning outcomes so that the learning process runs less effectively (Yusrizal & Fatmawati, 2020).

Some things that are found in the learning process in SD Negeri 11 Rantau Selatan also be ground or reference in this study. The problems associated with this research include 1) Students are less active in learning because generally the learning model applied by teachers at SD Negeri 11 Rantau Selatan is a teacher-centre learning model ; (2) The teacher's lack of understanding and mastery in applying learning models such as the Cooperative Learning Model with various types of variants; (3) Student learning outcomes tend to be weak and passive ; (4) The learning model applied by the teacher so far cannot stimulate students to be active in learning in the classroom; and (5) Variative student learning outcomes.

Based on the background of the problem above along with the facts of the observations in Class V SD Negeri 11 Rantau Selatan, researchers are interested in conducting research on Student Activity and Learning Outcomes in Science Subjects in Class V SD 11 Rantau Selatan related to Cooperative Learning Model Type Number Heads Together and Concept Mapping. Thus the title of this study is "The Effect of Cooperative Learning Model Type Number Heads Together and Concept Mapping on Learning Activeness and Student Outcomes in Science Subjects in Class V SD 11 Rantau Selatan".

II. Review of Literatures

2.1 Cooperative Learning Model Type Number Head Together

Numbered Heads Together (NHT) is a teaching method, in which each student is assigned a number, then groups are formed, and then the teacher randomly calls the number of the student. The unmatched type of managerial collaborative learning model is one of the types of collaborative learning, which is defined as numbered cooperative learning taking place in group, students are given the opportunity to share opinions to facilitate the maximum number of students' answers in completing the learning process. Education does not only educate students to become intelligent human beings, but also educate their character to have good character (Siregar, 2020).

In group formation, each group is assigned a number according to the number of group members. NHT type of collaborative learning is a type of fact-finding information that functions to organize cooperative learning relationships, consisting of four stages used for student reviews. This training can be used to solve problems with a limited difficulty level. Aspects developed in early childhood education are aspects of the development of habituation including social, emotional, independence, moral, and religious values, as well as the development of basic abilities which include the development of language, cognitive, and motoric physics.

The teacher only acts as an educator, who must guide, direct the discussion and motivate the discussion among classmates and so that learning runs smoothly and to achieve goals. Nana Sudjana (2010:25) states that "The working method of numbered heads together or NHT (Numbered Heads Together) is a structural approach to cooperative learning that has been developed by Spencer Kagen". Although it shares many similarities with other approaches, this approach emphasizes the use of specific structures designed to influence the way students interact.

2.2 Concept Map Learning Model (Concept Mapping)

One way for teachers to help the learning process in the classroom is by categorizing the material being taught so that the presentation is more focused and useful, as Rustaman (2001: 461). The learning process is a process in which there are interaction activities between teacher-students and there is a reciprocal communication relationship that takes place in an educational situation to achieve learning goals. In the learning process, teachers and students are two components that cannot be separated. Between the two components there is a mutually supporting interaction so that student learning outcomes can be achieved optimally. Bafadal (2005: 11) states that learning is defined as any effort or teaching and learning process in order to create an effective and efficient teaching and learning process. In line with that, Jogiyanto (2007: 12) also argues that learning can be defined as a process in which an activity originates or changes through the reaction of a situation at hand and the characteristics of changes in these activities cannot be explained based on original reaction tendencies maturity or temporary changes.

Slameto (2015:47) argues that the use of concept maps is a solution to make it easier for teachers to teach in class. A discussion that discuss thoroughly the Concept Map from understanding, characteristics, the steps for making a concept map to the goal of forming the concept map itself

2.3 Learning Activity

Learning activities are actions taken by students to make changes in knowledge, attitude value, and skills as deliberate exercises. Learning activities to take the actions given to change behavior through action are the basis of learning. The presence or absence of training is reflected in the presence or absence of activities. Without activity, learning is impossible. Therefore, the interaction of learning and teaching activities is the principle that allows the orientation of educational activities using low methods, media, and teaching-teaching approaches for higher education activities. Ginting (2020) states that Activities are principles or principles that are very important in teaching and learning interactions. Learning activities have some orientation to the view of psychology, namely the views of old psychology and modern psychology.

According to Nana Sudjana (2010:51) argues that "In learning activities and learning activities, students are required to always be active in processing and processing their learning acquisition". It states what is learned is the reason for each student learning activity. Inequality in student learning activities causes the level of learning activities to turn out to be ignored during the teaching and learning process. It must be added that what action imagines in learning is physical and mental action. The second activity of learning must always be related. For example, a person learns by reading physically, it seems that someone is reading a book, his mind and attitude should be focused on the book he is reading.

2.4 Student Science Learning Outcomes

Student Learning Outcomes are abilities that students acquire from their learning experiences, how to change their thinking patterns, values, perceptions, attitudes, assessments, and skills. Student learning outcomes are things that cannot be separated from learning activities because learning activities are a process, while learning achievement is a process of learning outcomes. Student learning outcomes are influenced by several factors. This factor consists of elements of investment in the world of education.

According to Benjamin S. Blom, there are three areas of learning: cognitive, effective and psychological. Meanwhile, the opinion of Purwanto Learning Outcomes is a change that causes people to change attitudes and behavior or learning outcomes are examples of actions, values, attitudes and perceptions and abilities then there are significant changes in student behavior that are consistent with teaching goals.

The opinion of Slameto, by describing the very broad factors that can affect student learning outcomes, one can classify it in two ways, namely, internal factors and external factors. Of the two factors that affect student learning outcomes are as follows: There are many types of factors that affect learning outcomes, they can be classified into two groups, namely internal factors and external factors.

III. Research Method

Type of this research is experiment with Design method Two Group Pre Post-Test Group Design. This research was conducted at SD Negeri 11 Rantau Selatan, Labuhanbatu Regency. The population in this study were all students of class V the 2019/2020 academic year. Samples were selected in this study that student's overall grade V SD Negeri 11 Rantau Selatan. The sampling technique used total sampling. The data collection techniques used in this study were observation and learning outcome test. The data analysis technique used in this research is inferential statistical techniques. Hypothesis testing is done by using the Two Way Anova test with a significant level of 0.05. Before

the Two Way Anova test is carried out, first the analysis requirements test is carried out, namely the normality test and the homogeneity test of the data. The normality test was performed using the Shapiro-Wilk test, while the data homogeneity test was carried out by the Levene test with a significant level of 0.05.

IV. Results and Discussion

4.1 Research Results

a. Description of Learning Activity against Cooperative Learning Model Type Number Head Together

To test the similarity of the assumptions from the results of the Learning Activeness data processing through the Cooperative Learning Model Type Number Head Together, it is necessary to test the Dependent Variable, namely Learning Activity and Predictors (Constanta), namely the Cooperative Learning Type Number Head Together as shown in the following table:

Table 1. Calculation Table with Two Ways Anova

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.005	1	.005	.441	.512 ^b
	Residual	.327	28	.012		
	Total	.332	29			
a. Dependent Variable: Learning Activity						
b. Predictors: (Constant), PKNHT						

From the ditas table it can be seen that the respondent consists of 30 students. Furthermore, to see the test we look at the Two Ways ANOVA table. Before continuing the test it is important to remember that one of Anova assumptions is that the variance is the same. From the Anova table, it can be seen that the test results show that the variants of the Respondents are the same (P-value = 0.327 - 0.32), so the Anova test is valid to test the relationship between the Effect of Cooperative Learning Type Number Head Together on Learning Activeness. Next, to see if there are differences in the income of these respondents, we look at the ANOVA table, from that table in the Sig. obtained P value (P-value) = 0.512. Thus, at the real level = 0.05, we reject Ho, so the conclusion is that there is a strong effect of Cooperative Learning Type Number Head Together on Learning Activeness.

b. Descriptions of Learning Activity against Concept Mapping Learning Model

For the final observation value with treatment in the experimental class 2, the data obtained in the final observation with a mean of 57.00 for 16 respondents with a standard deviation of 16.693 with a minimum observation value of 37 and a maximum of 85. For 12 respondents, the mean obtained was 57.92 with a standard deviation of 17,887 with a minimum observed hail value of 32 and a maximum of 92. Then the average gain is 57.39. So from the results of the acquisition of preliminary observations and final observations, it was found that the average (mean) was higher in the final observations after the application of the Concept Mapping Learning Model on student activity of 57.39. Furthermore, the data is tested through the Analysis of Variable Observation as shown in Table 2.

Table 2. ANOVA Calculation Table

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.000	1	.000	.981	.331 ^b
	Residual	.007	28	.000		
	Total	.007	29			
a. Dependent Variable: Learning Activity						
b. Predictors: (Constant), Concept Mapping						

In table 2 about the Anova calculation, it is known that one of the assumptions of Anova is that the variance is the same. From the Anova table, it can be seen that the test results show that the variants of the Respondents are the same (P-value = 0.007), so the Anova test is valid to test the relationship between the Effect of Concept Mapping Learning on Learning Activity. Furthermore, to see if there is a difference in the income of these respondents. We look at the Two Ways ANOVA table, from that table in the Sig. obtained P value (P-value) = 0.331. Thus at the real level = 0.05 we reject Ho, so the conclusion obtained is that there is a strong influence of Concept Mapping Learning on Learning Activeness.

c. Number Head Together Cooperative Learning Model against Student Learning Outcomes

Based on the results of research that has been conducted on the Effect of the Cooperative Learning Model Type Number Head Together on Student Learning Outcomes in Class V Science subjects at SD Negeri 11 Rantau Selatan, it is known that through the Test Sheet given to students in the experimental class consisting of 30 questions that have been its validity was tested and given after the application of the Cooperative Type Number Head Together Learning Model in the Experiment class.

Table 3. Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.124 ^a	.015	-.020	.15688
a. Predictors: (Constant), PKNHT				

Table 3 shows that Cooperative Learning Type Number Head Together has a relationship to Learning Outcomes of (R) 0.124 if squared by R², the level of determination/effective contribution is 0.015, which means the Cooperative Learning variable Type Number Head Together has an effective effect. That the large effect of Type Number Head Together Cooperative Learning on Learning Outcomes is 0.124 with a standard error of 0.156.

d. Description of the Concept Mapping Learning Model of Learning Outcomes

Based on the results of research that has been conducted on the Effect of Concept Mapping Learning Models on Student Learning Outcomes in Class V Science subjects at

SD Negeri 11 Rantau Selatan, it is known that through the Test Sheet given to students in the experimental class consisting of 30 questions that have been tested for validity and given after the application of the Concept Mapping Learning Model in the Experiment class.

Table 4. Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.122 ^a	.013	-.020	.13688
a. Predictors: (Constant), Concept Mapping				

Table 4 shows that Concept Mapping Learning has a relationship to Learning Outcomes of (R) 0.122 if squared R², the level of determination / effective contribution is 0.015, which means that the Concept Mapping Learning variable has an effective effect. The effect of Concept Mapping Learning on Learning Outcomes is 0.122 with a standard error of 0.136.

4.2 Discussion

The effect of the Numbered heads Together (NHT) cooperative learning model on learning activeness and student learning outcomes is calculated using the correlation formula. However, before using this correlation formula, the two data must be normally distributed and homogeneous. The difference between the control class and the experimental class using the Numbered heads Together (NHT) cooperative learning model towards learning activeness and student learning outcomes. The results of the research conducted show that the subject from previously lacking enthusiasm for learning activeness, by implementing the cooperative learning model in the form of groups can stimulate the subject to be more active in learning. Based on the statistical calculation data, the effect of cooperative learning type Number Head Together on Learning Outcomes is significant with a value of 0.10, with the value of multiple determination of the independent variable with a dependent 0.550 where the value is close to 1, meaning the correlation is strong.

Concept Mapping Learning has a relationship to Learning Outcomes of (R) 0.184 if squared R², the level of determination/effective contribution is 0.034 which means that the Concept Mapping Learning variable has an effective effect. The influence of Concept Mapping Learning on Learning Outcomes is 0.184 with a standard error of 0.144. Furthermore, to see if there is a difference in the income of these respondents, we look at the ANOVA table, from that table in the Sig. obtained P value (P-value) = 0.01. Thus the real level = 0,01, we reject Ho, so that the conclusions obtained is that there is a strong Effect of Concept Mapping on Learning Outcomes and Learning Activities.

The results of the Anova calculation are in accordance with the opinion of Anita Lie (2008: 26) that the Number Head Together in teaching and learning developed by Spencer Kagan provides an opportunity for students to share ideas and consider the most appropriate answers, besides this type is also encourage students to increase their spirit of cooperation.

The results of data processing is also consistent with research Nita Nurlina in 2015 under the title The use of Model Cooperative Type Number Head Together to Improve the attitude of tolerance and Learning Outcomes and Research conducted Astuti with the title

"The Effect of Cooperative Learning Model Type Numbered Head Together (NHT) Against Grade VII Students 'Mathematics Learning Outcomes at SMP Negeri 1 Bangkinang "it proves that the NHT cooperative learning model has a positive effect on students' mathematics learning outcomes on comparative and social arithmetic materials.

This can prove that discussion and cooperative learning techniques can be used in the classroom to increase student activity in learning. The above also explains that the purpose of the discussion can foster active motivation and the ability of students to be involved and participate when teaching and learning activities take place. So that with the results that have been achieved, it can be stated that the learning guidance of discussion techniques is effective in increasing the activity of students expressing opinions in the class.

From the processing of the results of this research data, it is obtained data that the Cooperative Learning Type Number Head Together has a relationship to Learning Activeness of (R) 0.124 if squared R^2 , the level of determination/effective contribution is 0.020 which means the Cooperative Learning variable Type Number Head Together has an effective effect. The large effect of Type Number Head Together Cooperative Learning on Learning Activeness is 0.124 with a standard error of 0.108. Cooperative Learning Type Number Head Together has a relationship to Learning Outcomes of (R) 0.124 if squared R^2 , the level of determination/effective contribution is 0.015 which means that the Cooperative Learning variable Type Number Head Together has an effective effect. The large effect of Type Number Head Together Cooperative Learning on Learning Outcomes is 0.124 with a standard error of 0.156. Because the calculated F value (5.76) is greater than the F table value (5.87), then H_0 is rejected, so the consequence is that the alternative hypothesis or H_1 is accepted. So it can be concluded that the Cooperative Type Number Head Together Learning Model has a significant influence on Learning Activeness and Student Learning Outcomes in Class V Science Subjects at SD Negeri 11 Rantau Selatan.

While the Concept Mapping Learning Model has a relationship to Learning Activeness of (R) 0.184 if squared R^2 level of determination / effective contribution is 0.034, which means that the Concept Mapping Learning variable has an effective effect. The effect of Concept Mapping Learning on Learning Activity is 0.184 with a standard error of 0.1554. Concept Mapping Learning has a relationship to Learning Outcomes of (R) 0.122 if squared R^2 level of determination / effective contribution is 0.015 which means that the Concept Mapping Learning variable has an effective effect. The effect of Concept Mapping Learning on Learning Outcomes is 0.122 with a standard error of 0.136.

V. Conclusion

Based on the results of research and discussion, several conclusions can be drawn including the following:

1. Cooperative Learning Type Number Head Together has a relationship to Learning Activity and Cooperative Learning Variables Type Number Head Together has an effective effect on Learning Activeness.
2. Type Number Head Together Cooperative Learning has a relationship with Learning Outcomes, which means that the Cooperative Learning Type Number Head Together variable has an effective effect. The Cooperative Learning Model Type Number Head Together has a significant influence on Learning Activeness and Student Learning Outcomes in Class V Science Subjects at SD Negeri 11 Rantau Selatan.

3. Concept Mapping Learning has a relationship to Learning Activity and Concept Mapping Learning has an effective influence on Learning Activeness.
4. Concept Mapping Learning has a relationship with Learning Outcomes and Concept Mapping Learning variables have an effective effect.
5. Student Learning Activity Variables Concept Mapping Learning Model has more influence on Learning Activities compared to Cooperative Learning Model Number Head Together. For Learning Outcomes Variables, Cooperative Learning Type Number Head Together has a higher effect on learning outcomes than the Concept Mapping Learning Model.
6. The Cooperative Learning Model Type Number Head Together and the Concept Mapping Learning Model have a significant influence on Learning Activity and Student Learning Outcomes in Class V Science Subjects at SD Negeri 11 Rantau Selatan. However, if it is analyzed on the aspect of a stronger influence on Activities and Learning Outcomes, then based on the results of the above calculations, it is obtained data that the Concept Mapping Learning Model has a stronger effect on student learning activeness compared to learning outcomes in science subjects. The Number Head Together Learning Model has a stronger influence on the results than the student learning activity in science learning material

References

- Bafadal, Ibrahim. (2005). *Pengelolaan Perpustakaan Sekolah*. Jakarta: Bumi Aksara
- Ginting, S.J.B., Ruslan, D., and Rahman, A. (2020). Development of PPKn Module for the Love of the Environment Material Using Example Non Example Learning Model to Increase Student Learning Activities in Class II Public Elementary School 040446 Kabanjahe T.P. 2018/2019. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal* Vol 3 (2): 854-870.
- Goleman, Daniel. (2003). *Emotional Intelligence*. Jakarta: Gramedia Pustaka Utama
- Jumanta, Hamdayama. (2014). Model dan Metode Pembelajaran Kreatif dan Berkarakter. *Ghalia Indonesia. Jurnal Pendidikan dan Pembelajaran Dasar*. 4 (2)
- Siregar, S.F., Mardianto, Ahkas, A.W. (2020). Extracurricular Implementation of Islamic Education in Character Building Students in MTs EX PGA UNIVA Medan. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal* Vol 3 (2): 965-973.
- Sudjana, Nana. (2009). *Penilaian Hasil Proses Belajar Mengajar*. Bandung: PT Remaja Rosdakarya.
- Susanto, Ahmad. (2013). *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta: Kencana.
- Windura, Sutanto. (2008). MIND MAP Langkah Demi Langkah. Jakarta: PT Elex Media Komputindo Kelompok Gramedia. *Jurnal Ilmiah "Pendidikan Dasar"* Vol. VI No. 2 Juli 2018.
- Yusrizal, Y., & Fatmawati, F. (2020). Pengaruh Model Reciprocal Teaching dan Kecerdasan Intrapersonal terhadap Hasil Belajar IPS Siswa. *Jurnal Tematik*, 10(2), 90–95.