

THE EFFECT OF COOPERATIVE LEARNING MODEL TYPE GROUP INVESTIGATION (GI) TO STUDENTS' LEARNING OUTCOME ON LINEAR MOTION TOPIC

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ABSTRACT

The objectives of this research is to know whether students' learning outcome by using cooperative learning model type group investigation is better than conventional learning in the subject matter linear motion in class X SMA Santo Thomas 3 Medan A.Y. 2014/2015. The research method was quasi experimental. The populations were all X IPA grade students in first semester that consist of 3 classes SMA Santo Thomas 3 Medan. The samples of this research conduct two classes and consist of 62 students, 31 from experiment class and 31 from control class and define by random cluster sampling. The results that were obtained: pre-test mean value of experiment class was 42.26 and 41.45 for control class and then post-test mean value of the experiment class was 80.48 and 64.03 was the mean value for control class. Standard deviation in pre-test were 7.62 in experiment class and 7.55 in control class and standard deviation in post-test for two classes were 6.87 and 8.89. Then, based on observation that done by observers by using observation sheet of students' affective and psychomotor. Students' affective score on last meeting of experiment and control class are 91.83 and 87.10 and students' psychomotor score on last meeting of experiment and control class are 85.01 and 80.78 . From hypothesis test, concluded that students' learning outcome after taught by using cooperative learning model type group investigation is better conventional learning.

Key word: Cooperative Learning Model Type Group Investigation, Students' Learning Outcome.

INTRODUCTION

Learning process occurs through many ways and takes place all the time toward a behaviour changing in learners. The changing are in the form of knowledge, understanding, skills, and habits that acquired by the lerners. The main activities in teaching and learning are the emphasis on engaging students in learning,

But in fact physics is one lesson that has the lowest score. This

is caused by the large number of student who doesn't like physics because they think physics is a difficult subject to understand, especially when faced with a complicated formulas and calculations. This fact is in accordance with the results of observations conducted by researchers at SMA Santo Thomas 3 Medan. Researcher use questioner instrument to observe student interest in physics subject. From the

observation result, At the class there was $\pm 73\%$ student said rarely learn physics in group, $\pm 16\%$ student said always and just $\pm 11\%$ said never learn physics in group discussion. Before learn physics, just $\pm 16\%$ student prepare them self before learn physics, then $\pm 79\%$ student sometimes do the preparation, and there was 5% student don't do anything. And then there was $\pm 24\%$ student interest to solve physics problem by them self, then $\pm 76\%$ student interest to solve physics problem with discussion. From the observation result above, researcher conclude that student in SMA Santo Thomas 3 Medan wasn't interest to learn physics and rarely learn physics. And this will be influenced the student outcome in learning physics.

Researchers also observe three physics teacher when they teach at SMA Santo Thomas 3 Medan. From the observation, researcher finds that most of physics teacher, use conventional learning to explain physics phenomenon in front of the class. And this will be influenced the student outcome in learning physics. There are many things that cause low result of this study, one of which is the use of learning methods that teacher is less variable and the model is still used conventional teaching models. Djamarah (2009:26) states "When teacher teach when only using one of the methods it will be boring, uninterested student attention on the lesson " . The use of model made by teacher in the teaching of physics, still using conventional learning model and method used approach is the method of lecture and discussion. Meanwhile, in the subject of physics, which requires not only how student

solves problem by memorized formula, but students must be able to understand the concepts of physics. And understanding of concepts by student, can't be done with the lecture method and the conventional model, because the model and the method will only create an atmosphere of teacher-centered learning . And learning environment like this, it will only make student passive but also makes the student doesn't have the opportunity to develop their understanding of physics concepts.

To solve the above problems, researcher changes conventional learning model toward cooperative learning model. Cooperative learning model consists of several kinds, one of which cooperative learning model type Group Investigation (GI) is a model that doesn't require student to memorize facts and formulas, but a model that guide student to identify the topic, planning investigations in group, carrying out investigation, reported, and presented research result. Group investigation is a cooperative learning method and has as hallmark student working in small group, actively constructing their knowledge, with the enhancement of student learning and student satisfaction (Marlowe and Page : 2005). Group Investigation includes for important components ("the four I's") : investigation, interaction, interpretation, and intrinsic motivation (Daniel Zigaro : 2008). All component, help student to understand physics clearly, because the student will learn by them self and find the answer with their team. And it will make student have a good teamwork and can memorize the lesson for a long time.

Cooperative learning model group investigation had been examined by previous student by (Adolf: 2012) the result of research conducted by Adolf at SMAN 1 Kec. Binjai, states that there is difference in physics learning outcomes using cooperative learning model group investigation of the average pretest score 30.88 after learning the type of cooperative group investigation model of the average value increased to 71.50. (Mery:2010) result of research conducted by Mery at SMAN 1 Percut Sei Tuan, stating that during the student learning outcomes using the model of cooperative group investigation the learning outcome get increased. At the first meeting of the average value of 33.55, and at the second meeting of the average value of 70.84.

From the research that has been done, the researcher argued that there are some weaknesses, namely, (Adolf:2012) failed to give more attention and guidance to student who is less active and in the use of instructional media is still less, (Mery:2010) is less efficient in the use of time, and student need more motivation to explore their statement. The advantages of the current research, will motivate students who less active and more attention to the details of the allocation and the use of instructional media, researchers use lab tools that are already available in the laboratory of SMA Santo Thomas 3 Medan, to raise the interest of student in participating teaching and learning activities .

Based on explanation above the writer wants to do the research with title “The Effect of Cooperative Learning Model Type Group

Investigation (GI) To Students’ Learning Outcome On Linear Motion in 10th Grade SMA Santo Thomas 3 Medan A.Y. 2014/2015”.

RESEARCH METHODE

This research was conducted in SMA Santo Thomas 3 Medan at class X on November academic year 2014/2015. Population of this research is all students in class X SMA Santo Thomas 3 academic year 2014/2015 that consist of 3 classes, and each classes consist of 29-31 students. The sample that would be taken is chosen by cluster random sampling. The sample is divided into two classes consisting of one class as experimental class and the other class as control class.

This research is involves two different treatments for the experimental class and the control class, where the two classes are treated differently. The experimental class treated with guided cooperative learning model type group investigation and the control class treated with conventional learning.

To determine the student’s understanding of the concept is done by giving test on both classes before and after treatment, which are called pretest and posttest.. The design of the research is as follows:

Table 3.1. Design of Research

Class	Pretest	Treatment	Posttest
Experimental	X ₁	P	X ₂
Control	X ₁	Q	X ₂

Description :

X₁ = Pretest

X₂ = Posttest

P = Learning using guided cooperative learning model type GI

Q = Learning using conventional learning

The selection of data aimed to observe whether the samples come from normal distribution population or not. The test used is Liliefors test and Homogeneity test, to know the homogeneity of both samples used formula as follows (Sudjana, 2009) :

$$F_{count} = \frac{S_1^2}{S_2^2} \dots\dots\dots 1)$$

Description:

S_1^2 = Variance in experimental class

S_2^2 = Variance in control class

If $F_{count} \geq F_{table}$, H_0 is refused (have different variance) where the $F_{table} = F_{(1-\alpha)(n-1)} < F < F_{\frac{1}{2}\alpha(n_1-1, n_2-1)}$

obtained from the distribution list F with $\alpha = 0.1$.

Hypothesis test use t-test with formula (Suryabrata, 2002) :

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

S is combination of standard deviation can be calculated with formula :

$$S^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

Where :

\bar{x}_1 = Average value in experimental class.

\bar{x}_2 = Average value in control class.

n_1 = Total of sample in experimental class.

n_2 = Total of sample in control class.

S^2 = Variance

S_1^2 = Variance in experimental class

S_2^2 = Variance in control class

t = t distribution

Testing criteria is accept H_0 if $-t_{1-\frac{1}{2}\alpha} < t < t_{\frac{1}{2}\alpha}$ where $t_{\frac{1}{2}\alpha}$ we get from t list with dk = n_1+n_2-2 and probability $(1-\frac{1}{2}\alpha)$. To another value

of t H_0 is not accept. Value of t_{count} compare with t_{table} get from t table list to $\alpha = 0.05$. If $-t_{1-\frac{1}{2}\alpha} < t < t_{\frac{1}{2}\alpha}$ on the level $\alpha = 0.05$ and independent degree dk = n_1+n_2-2 , so have the same initial ability of student.

RESULT OF RESEARCH

This research done in Class X SMA Santo Thomas 3 Medan A.Y. 2014/2015 using two class as the sample that is experiment class taught by Cooperative Learning Model Group Type Investigation and in control class taught by Conventional Learning.

Before the model applied in class, student doing the pre-test and get the data that the initial ability of both classes is same. After that experiment, class taught by Cooperative Learning Model Group Investigation Type and control class taught by Conventional Learning. And then, student tested again, gotten the data that mean score experiment class is 80.48 better than control class 64.03. Then, there are an students' affective and psychomotor assesment when learning process at class. Students' affective score in experiment class is 91.83 but in control class, score is 87.1. Students' psychomotor score in experiment is 85.01 but in control class, score is 80.78.

The significant increasing of students' learning outcome(cognitive, affective and psychomotor) in experiment class because the teaching and learning process by using Cooperative Learning Model Group Investigation Type given the advantage to student to find the concepts by theirselves. Because if the student find the concepts by

their own, the students will remember that concepts for long time and make students understand about the concepts.

In hypothesis test showed that the different increasing of students' learning outcome in experiment and control class. The students' learning outcome is better in experiment class. So, can be concluded that have **Effect of Cooperative Learning Model type Group Investigation (gi) to Students' Learning Outcome on Linear Motion Topic in 10th grade SMA Santo Thomas 3 Medan a.y. 2014/2015.**

Application of Cooperative Learning Model Type Group Investigation using varied methods, interactive, so students are more motivated to learn and actively in the learning process compared to conventional learning, where the teacher only uses learning methods tend to be monotonous, one-way interaction and instructive.

In the implementation of the learning process by applying Cooperative Learning Model Type Group Investigation in experimental class, students are grouped into several groups, investigating, discussions, presenting and work on student worksheet. In other words, the learning process in Cooperative Learning Model Type Group Investigation directing students to construct their own concepts or principles of linear motion so that students understand the subject matter and learning outcome will increase.

At the initial stage, the teacher suggested objectives and an overview of the linear motion, then give student worksheet to students. Student worksheet is organized in a systematic way in order to assist

students in understanding the principles or concepts independently and train the students' ability to think of the linear motion material. In the later stages, students investigating and then discuss the results and answer the questions contained in the student worksheet then the students put forward a new principle or concept.

In the implementation process of control class learning by applying Conventional Learning using the lecture method. In the early stages of the teacher to explain to students the linear motion, then the teacher gives the example problems and the solution. The teacher provides the opportunity for students to ask questions about things that are not yet understood. After all the students learned, then the teacher gives exercises to students.

Conclusion

Based on research result and data collection, can be concluded that:

(1) Students' learning outcome in experiment class after taught by using Cooperative Learning Model Type Group Investigation was cognitive average score is 80.48, affective score is 91.83 in very good criteria and psychomotor score is 85.01 in good criteria. (2) Students' learning outcome in control class after taught by using Conventional learning was cognitive average score is 64.03, affective score is 87.10 in good criteria and psychomotor score is 80.78 in good criteria. (3) Students' learning outcome in experiment class after taught by using Cooperative Learning Model Type Group Investigation was better than students' learning outcome in control class that's using Conventional Learning. So, Cooperative Learning Model Type Group Investigation has

the effect on students' learning outcomes.

Suggestion

According to the data of students' learning outcome and the experience of author when applying the Cooperative Learning Model Type Group Investigation in class, so the author gives suggestion as below:

(1) Needed further research to determine the effect of cooperative learning model type group investigation on student achievement in other materials concepts, so that it can measure the extent to which wider this model is effective in learning physics. (2) For the next researcher who wants to do research using cooperative learning model type group investigation, it's better for teacher to develop creativity in implementing the learning process so that student character can be more improved. In addition, teachers can motivate students to be more active so that good communication between students and students and between teachers and students. (3) For the next researcher who wants to do research using cooperative learning model type group investigation expected to allocate the time as efficient as possible in the learning process so that each stage of learning can be done well. (4) For teacher can use the cooperative learning type model group investigation to increase students' learning outcome.

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