IMPROVEMENT PHYSICS LEARNING OUTCOME THROUGH COOPERATIVE LEARNING MODEL TYPE GROUP INVESTIGATION AND STUDENT LEARNING MOTIVATION IN SMAN 1 PESANGGARAN-BANYUWANGI

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Abstract

This research aims to determine the effect of GI type cooperative learning model and learning motivation, as well as the influence of interaction model of cooperative learning type GI and motivation to physics learning outcome. The population in this research is the students of class XI IPA SMAN 1 Pesanggaran-Banyuwangi, which consists of 2 class groups that are homogeneous, the control class and experimental class. The data used in this research are primary data collected from pre-test and post-test for learning outcome, and questionnaires for student motivation data. The instrument before it is tested has been tested for its validity and reliability. The statistical test uses two way anava analysis method with the help of SPSS computer program. The results showed that (1) there were significant differences between groups of students using cooperative type of GI learning model with conventional learning model on Physics learning outcome. (2) there is significant difference of influence between high motivated group of students with low motivation toward Physics learning outcome. (3) There is no interaction of GI type cooperative learning model and learning motivation toward student physics learning result at SMAN 1 Pesanggaran. From the results of this research teachers are required to always innovate in choosing a model of learning. Because with the selection of learning models in accordance with the conditions of learners and schools, will be able to improve learning outcome. One of the learning models that can improve learning outcome is with the GI model.

Keywords: Cooperative Type GI Learning Model, Learning Motivation, Learning outcome.

1. Introduction

Education is a very important element to create quality human resources. Therefore education programs should always be reviewed and improved. School data from year to year shows relatively low learning outcomes. Of the 175 students of grade XI IPA SMAN 1 Pesanggaran-Banyuwangi, only 35% achieved the KKM value of 75. While the average 65% has not reached the KKM, so it must be remedial program. One reason is the lack of innovation in learning. Therefore, the researcher took the theme of influence of study group investigation model and student's motivation toward student achievement. Problems in this research are: (1) Is there any influence of cooperative learning model of group investigation type toward physics learning outcome at student of SMAN 1 Pesanggaran-Banyuwangi ?, (2) Is there any influence of student's learning motivation to Physics learning outcome at student of SMAN 1 Pesanggaran- Banyuwangi ?, (3) Is there any interaction influence of cooperative learning model of group investigation type and motivation toward physics learning outcome in student of SMAN 1 Pesanggaran-Banyuwangi ?. While the purpose of conducting this research are: (1) To know the influence of cooperative learning model of group investigation type toward physics learning outcome in students of SMAN 1 Pesanggaran-Banyuwangi, (2) to know the influence of student's learning motivation toward physics achievement at student SMAN 1 Pesanggaran-Banyuwangi, 3) Knowing the influence of interaction model of cooperative learning type of group investigation and motivation on physics learning outcome in students of SMAN 1 Pesanggaran-Banyuwangi.

2. Theoretical Framework and Development of Hypotheses

2.1 Relevant Research

From research about the influence of learning model on student learning outcome that has been done before, the average result there is significant influence. The research was conducted by Astiti (2012), Marsahid (2012), Supriyadi (2013), Kustiani (2013), Siswati (2014), Artini (2015), and many other studies on learning model. But for the motivation to learn, not all the research results states there is influence. The results of which no influence among other research units Astiti (2012) and Supriyadi (2013). While the research of Siswati (2014) stated that motivation has no influence on learning outcome. This can happen because the research by using questionnaire to know the high of student's

motivation can be influenced by research sample controlled by confounding factor, for example student age, gender, student background, and so on.

2.2 GI and Conventional Cooperative Learning Model

In general planning of organizing classes using cooperative techniques *Group Investigation* is a group formed by the students themselves with consisting of 2-6 people, each group is free to choose a subtopic of the total units of material to be taught, and then make a report group. Subsequently, each group presented its report to the entire class, to share and exchange information on their findings (Slavin, 2008).

In a large Indonesian dictionary (1991: 523), conventional means based on custom or traditional. Thus, conventional learning is the usual teaching done by the teacher. In general, conventional learning is a more teacher-centered learning.

2.3 Motivation and Learning Outcome

Motivation is a mental force that drives learning that comes from various sources. Students learn because driven by mental strength in the form of desire, attention, will, or ideals. The mental strength can be low or high (Sardiman, 2011). Motivation is divided into 2 groups, namely: (1) Intrinsic motivation is the motivation in yourself to do something for the sake of something itself, (2) Extrinsic Motivation is doing something to get something else. Extrinsic motivation is often influenced by external incentives such as rewards and punishments. Learning outcome is an indicator of the absorption (intelligence) of students (Denny Mahendra Kushendar, 2010). The learning outcome is influenced beberpa factors, namely: (1) **The internal factors,** such as intelligence, aptitude, interests, and motivations of each idividu, (2) **External factors,** such as family circumstances, experiences, environment, learning model etc. The function of learning outcome, are: (1) As an indicator of the quality and quantity of knowledge of learners, (2) As a symbol of the fulfillment of curiosity desire, (3) As an information material in educational innovation, (4) As an internal and external indicators of an institution education.

2.4 Hypothesis Development

Hypothesis of this research are:

H1. There is the influence of cooperative learning model type group investigation of the physics learning outcome in students of SMAN 1 Pesanggaran-Banyuwangi.

H2. There is influence of student's learning motivation on physics learning outcome at student of SMAN 1 Pesanggaran-Banyuwangi.

H3. There was an interaction effect cooperative learning model type group investigation and motivation towards researching physics at the learning outcome of students of SMAN 1 Pesanggaran-Banyuwangi.

3. Research Methods

3.1 Population and Sample Research

The research was conducted in SMAN 1 Pesanggaran Banyuwangi in November 2016. The population in this research were students of class XI IPA SMAN 1 Pesanggaran-Banyuwangi as many as 70 students. The sampling technique in this research is purposive cluster sampling Sampling techniques based on certain considerations and characteristics. In this research, students who were sampled were students of XI IPA class A and class B, each of which amounted to 35 students and has the same characteristics.

3.2 The Design and Type of Research

This research used an experimental method, with a design pretest-posttest control group design. Experiments conducted in two classes, namely class A and class B, the sample is a sample treated with the method of GI type cooperative and control samples using conventional methods.

O_1 —— X —— O_2	
O_3 ———— O_4	

Information :

O_1, O_3 = Student learning outcome before getting a cooperative learning model type group investigation the experimental class, and conventional learning models in the control class.

O_2, O_3 = Student learning outcome after obtaining a cooperative learning model type group investigation the experimental class, and conventional learning models in the control class.

Based on the type, this research included Quasi Experiment research and survey research. Quasi-Experimental research is research using experimental and control groups were treated by using draft pretest-posttest control group design as a means of data collection. While the survey research is a research that uses a questionnaire as a means of data collection (Sugiyono, 2012).

3.3 Identify Variables

Variables of research is anything in the form of what is determined by the researchers to be studied, so obtained information about it, to then be drawn conclusion (Sugiyono, 2007). The independent variable in this research is a model of learning Cooperative Group Type Investigation and motivation to learn. While the dependent variable is the learning outcome.

3.4 Operational Definition

In order not to misunderstand with the term used in this research, the authors explain the term used in this research:

a. Cooperative Learning Model Group Investigation

GI cooperative learning model is planning a class organization which was created by the student group consisting of 2-6 people, each group is free to choose a subtopic of the total units of material (subject) to be taught, and report group. Subsequently, each group presented its report to the entire class, to share and exchange information on their findings (Slavin, 2008)

b. Conventional Learning Model (Lecture)

The conventional learning model (lecture) is the way the teacher conveys the teaching materials material with a direct oral explanation of the students. This method is a more active teacher and students only listen and give answers when asked so that if the teacher is less interesting in the delivery then the students are less attention and sometimes sleepy (Suryobroto, 2009).

c. Motivation to learn

Motivation to learn is one that encourages or encourages students to learn which includes internal (external) and external (Santrock, 2004) encouragement.

d. Learning Outcome Learn

Learning outcome is the result that has been achieved by students after the learning that in this research only focus on the cognitive aspect (Saeffudin Azwar, 2000).

e. Physics Subjects

Physics subjects in question is the curriculum or syllabus of physics subjects high school class XI IPA. The material used in this research is about Business and Energy.

3.5 Data Collection Methods

Data collection methods are techniques or methods used to collect data. Data collection techniques used to conduct this research are:

a. Learning outcome Test

To obtain data in the form of Physics learning outcome, researchers use research instruments in the form of ability tests (learning outcome test) consisting of 20 items. Before use, the test needs to be tested first to find out the questions that meet the requirements of good test preparation, including the validity and reliability.

b. Questionnaire Motivation Learning:

Data in the form of learning motivation is obtained by using questionnaire or questionnaire consisting of 20 questions. Each item has 5 choices. Description of the provisions of scoring in the questionnaire is as in tables 3.1 and 3. The following:

Table 3.1 Distribution Score For Statement of Problems That Support (+)

Answer	Strongly agree	Agree	Doubtful	Disagree	Strongly Disagree
Score	5	4	3	2	1

Table 3.2 Score Distribution For Problem Statement Does Not Support (-)

Answer	Strongly agree	Agree	Doubtful	Disagree	Strongly Disagree
Score	5	4	3	2	1

3.6 Data Analysis Methods

a. Test Instruments

Research instruments to be used in research, before use should be tested first quality. To test the quality of the instrument used 2 kinds of test, namely test validity and reliability test for learning outcome test and motivation.

b. Validity test

In this research the validity of instrument test is calculated by using product moment formula (Sugiyono, 2012: 183), that is by formula:

$$r_{xy} = \frac{N\sum XiYi - (\sum Xi)(\sum Yi)}{\sqrt{\{N\sum Xi^2 - (\sum Xi)^2\}}\sqrt{\{N\sum Yi^2 - (\sum Yi)^2\}}}$$

Information:

r_{xy} = Product moment correlation coefficient between x and y

X = The value of the variable X

Y = The value of the variable Y

N = number of subjects

$\sum$ = Sigma Total score

c. Test Reliability

Reliability is a measure that shows reliable results if the test is tested multiple times (Sugiyono, 2012: 131). To know the reliability of the instrument by using Spearman Brown, that is by the formula:

$$\left[r_i = \frac{2r_s}{1 + r_s}\right]$$

Information :

r_i = Coefficient of correlation whole matter

Rs = Correlation coefficient about half of which were found to determine the level of correlation can be used dallar as follows:

1. $0.80 < r_i$, 1.00 correlation is very high
2. $0.60 < r_i$, 0.79 high correlation
3. $0.40 < r_i$, 0.59 correlation was
4. $0.20 < r_i$, 0.39 lower correlation

5. $0.00 < r_i$, 0.19 correlation is very low

3.7 Hypothesis Testing

Hypothesis test is done to find out whether the hypothesis in the research accepted or rejected (Sugiyono, 2012: 192). In this research hypothesis test using analysis of variance (anova) two lane by using formula:

$$F_h = \frac{R^2/k}{(1-R^2)/(n-k-1)}$$

Information :

F_h : Double correlation coefficient

k : The number of independent variables

n : The number of members of the sample

The data obtained were then tabulated using a 2x2 factorial design and analyzed using F test statistic (using two-way anova)

Table 3.3 Factorial Design 2 x 2

MOTIVASI	METODE	
	Kooperatif Tipe Group investigation (A1)	**Konvensional (A2)**
TINGGI (B1)	A1.B1	A2.B1
RENDAH (B2)	A1.B2	A2.B2

Information:

A1.B1: Cells group of students who were given a cooperative learning type group investigation and have high motivation to learn.

A2.B1: Cells group of students who were given conventional learning and motivated.

A1.B2: Cells group of students who were given a cooperative learning type group investigation and have low learning motivation.

A2.B2: Cells group of students who were given conventional learning and have low motivation.

After analysis of statistical data to *Microsoft Excel* and *SPSS* like the above steps (Trihendradi, 2012), then consulted with the F test distribution table, so it can be concluded as follows:

- If the results obtained by analysis of the results of $F_{arithmetic} < F_{table,}$ then Ho is rejected and H_1 accepted.
- Likewise, if the results of the analysis of the results obtained $F_{count} > F_{table,}$ then Ho is accepted and H_1 rejected.

4. Discussion

4.1 Research Result

Respondents were students of class XI IPA 4 and IPA 5 SMAN 1 Pesanggaran which amounted to 70 students, and divided into experiment class and control class. Data influences *GI* cooperative learning model and learning motivation towards learning outcome of physics at SMAN 1 Banyuwangi Pesanggaran overall as in the table below.

Table 4.1 Summary of Data Research Effects of *Cooperative* Learning *Model GI* And Motivation on Learning outcome

Motivasi / Model	Tinggi	Rendah	Total
Kooperatif tipe GI			
N	27	8	35
Mean	81,85	74,38	80,14
Sd	9,109	4,955	8,869
$\sum X$	2210	595	2805
Konvensional			
N	18	17	35
Mean	74,72	67,94	71,43
Sd	6,057	4,351	6,251
$\sum X$	1345	1155	2500
Total			
N	**45**	**25**	**70**
Mean	**79**	**70**	
Sd	**8.7**	**5,401**	
$\sum X$	3555	1750	

From table 4.1 above shows that:

a. There are significant differences between the groups of students who got a type of cooperative learning model that uses the Group Investigasion with conventional learning models in physics

learning outcome indicated by the mean value on the interpretation of learning generated models of GI type Cooperative Learning 80.14 and 71.43 with conventional learning models.

b. There is a significant difference between high motivated and low motivated students in Physics learning outcome as indicated by mean niali on highly motivated learning pretensions 79 and low motivation 70.

c. There was no significant interaction effect between GI cooperative learning model with physics motivation on learning outcome indicated by the mean value of the cooperative group GI mode with low motivation 74.38 and conventional groups with low motivation 67.94.

4.2 Analysis of Research Results

Hypothesis testing is done by analysis vaktorial two lines with the aim to investigate the differences in the application of learning models and student motivation, and the interaction effect *(interaction effect)* are both on the learning outcome of Physics. A summary of the results of two-lane vaktorial analysis is included in the table below.

Table 4.2 Analysis of Anova Two Path Analysis

Tests of Between-Subjects Effects					
Dependent Variable: Learning outcomes					
source	**Type III Sum of Squares**	**df**	**mean Square**	**F**	**Sig.**
corrected Model	2075.951 [a]	3	691 984	14 027	.000
intercept	323191.648	1	323191.648	6.552E3	.000
Model_Belajar	665 545	1	665 545	13 491	.000
Motivation to learn	735 441	1	735 441	14 908	.000
Model_Belajar * Motivasi_Belajar	1,752	1	1,752	.036	.851
Error	3255.835	66	49 331		
Total	407375.000	70			
corrected Total	5331.786	69			

a. R Squared = .389 (Adjusted R Squared = .362)

The result of anova two-lane calculation above, can be concluded as follows:

a. First Hypothesis

There are differences in Learning outcomes of students taught by conventional learning models and the use of cooperative learning model of *GI*. This conclusion is based on analysis of test results of Anova two lanes in Table 4.2, the value (F_{hit}) 13 491 > (F table) 3,13 at significance level (α) of 0.05 and P velue (Sig.) 0000 < (α) 0.005. This means that $H_{0\ is}$ rejected and H_1 accepted.

b. Second Hypothesis

There are differences in student Learning outcomes that have high learning motivation compared with those with low learning motivation. This conclusion is based on analysis of test results of Anova two lanes in Table 4.2, the value (F_{hit}) 14,908 < 3.13 (F table) at significance level (α) of 0.05 and P velue (Sig) 0.000 < (α) 0 , 05. This means H_1 received and H_0 is rejected.

c. Third Hypothesis

There is no interaction cooperative learning model of Group Investigation and motivation to learn the results of researching physics at SMAN 1 Pesanggaran. This conclusion is based on analysis of test results of Anova two lanes in Table 4. 2, the value (F_{hit}) 0.036 < (F table) 3,13 at significance level (α) of 0.05, and P velue (Sig) 0.851 < (A) 0.05. This means that H_0 is received and H_1 rejected.

4.3 Interpretation

From the observation and analysis above showed that no significant difference between the interaction GI cooperative learning model with motivation on Learning outcome physics. This is shown from the statistical test with the help of computer program SPSS, obtained F arithmetic (0.036) < F table (3.13), Sig value. 0.851 > 0.05. This happens because students who are equally highly motivated will try to find out a material through various ways. For example, by browsing or also with lessons outside school hours.

From the table 4.1, it appears that the results of learning outcome experimental class is better when compared to the control class. The mean of the experimental group was 80.14. While the control class is 71.43. This shows that the application of learning model to students can improve Learning outcomes.

From the data in Table 4.1, it can be seen that the result of student learning outcome with high motivation average is better than low motivated students. Students with high motivation numbers 45 students, Mean of post-test was 79. Meanwhile, students with low motivation totaling 25 students, Mean

of post-test is 70. Therefore, an educator should also be a motivator for the students, with the aim of Improve Learning outcomes.

5. Conclusions, Implications and Limitations

5.1 Conclusions

Based on the objectives, the results of research and data analysis can be concluded things as follows:

a. A significant difference between the groups of students who receive learning using cooperative learning model GI with students who use conventional learning models in improving learning outcome Physics.
b. There is a significant influence between groups of students who have high motivation and low motivation in improving Physics learning outcome.
c. No significant difference between the interaction of the use of GI type learning model with the motivation to learn to learning outcome learn physics.

5.2 Implications

An educator should be able to select and sort the learning model which can boost Learning outcomes for learners one type of cooperative learning model of Group Investigation, or with other learning models adapted to the conditions of the school, learners and materials to be delivered.

Motivation is a relatively fixed nature in a person, which has a great influence on learning outcome, because with the motivation someone will be able to do something, otherwise without the motivation impossible someone can do something. With the motivation that arises from within the students themselves, it will be able to produce better results.

For educational managers are expected to create innovative policies, namely by providing opportunities for educators to follow the activities of self-development through MGMP (Musyawarah Guru Mata Pelajaran) according to the subjects that diampu. Besides education managers should also provide the needs of their students in the school, such as a lab, library, hotspots, and so on.

5.3 Limitations

As we all know, the learning model is of many kinds. This research only discuss about the influence of GI learning model and the motivation and interaction of both to increase learning outcome. This

means that the GI learning model is not the only determinant of the success of a lesson. Educators and other researchers can use other learning models that can stimulate student activity and creativity.

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