

RELATIONSHIP OF JIGSAW-TYPE COOPERATIVE LEARNING MODEL WITH STUDENT LEARNING OUTCOMES

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Article History	Abstract. This study aims to find out the relationship of jigsaw-type
	cooperative learning model with student learning outcomes on the concept of
Received: 12-08-2020	opportunity in grade XI SMK Muhammadiyah Ambon The type of research
D 04 00 0000	used is correlational quantitative, namely research. The sample in this study
Revision: 26-09-2020	amounted to 28 people. The instruments used are tests and questionnaires. Tests
Accepted: 05-10-2020	determine students' responses to jigsaw-type cooperative learning models. Data
Published: 30-10-2020	analysis techniques used are Product Moment Correlation. The results showed that there is a strong relationship between jigsaw-type cooperative learning models and students' learning outcomes in the opportunity material in smk Muhammadiyah Ambon class. Hypothetical test results using correlation test Products moment obtained r_{value} of 0.8374. While the conversion result based on the table of distribution of r_{table} is obtained r_{table} value at the level of 5% which is 0.374. Keywords: Cooperative Learning Model, Jigsaw, Learning Outcomes
	<i>Abstrak.</i> Penelitian ini bertujuan untuk mengetahui hubungan model pembelajaran kooperatif tipe <i>jigsaw</i> dengan hasil belajar siswa pada konsep peluang di kelas XI SMK Muhammadiyah Ambon Jenis penelitian yang digunakan adalah kuantitatif korelasional yakni penelitian yang. Sampel dalam penelitian ini berjumlah 28 orang. Instrumen yang digunakan yaitu tes dan angket. Tes digunakan untuk mengetahui hasil belajar siswa dan angket digunakan untuk mengetahui respons siswa terhadap model pembelajaran kooperatif tipe <i>jigsaw</i> . Teknik analisis data yang digunakan yaitu <i>Korelasi Product Moment</i> . Hasil penelitian menunjukkan bahwa terdapat hubungan yang kuat antara model pembelajaran kooperatif tipe <i>jigsaw</i> dengan hasil belajar siswa pada materi peluang di kelas SMK Muhammadiyah Ambon. Hasil uji hipotesis dengan menggunakan uji <i>korelasi Products moment</i> yang diperoleh r _{hitung} sebesar 0,8374. Sementara hasil konversi berdasarkan tabel distribusi nilai r _{tabel} yakni diperoleh nilai r _{tabel} pada taraf 5% yakni sebesar 0,374. Kata Kunci: Model Pembelajaran Kooperatif, Jigsaw, Hasil Belajar

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INTRODUCTION

The development of science has accelerated rapidly because it is always closely related to the development of technology that provides rides that enable such developments. Rapid development has encouraged educators to be able to design and implement education that is more focused on mastery of mathematics, which can support daily activities in the community. Therefore, to be able to adjust these developments requires creativity and quality of human resources must be improved through educational pathways. To improve the quality of learners through mathematics learning, teachers are expected to not only understand mathematical products, but should also understand the nature of the mathematical learning process that includes three areas of ability, namely cognitive, affective and psychomotor. Therefore, the experience of learning mathematics must provide student growth and development in every aspect of the ability.

A good learning process can not be separated from the cooperation between teachers and students. A good teacher is a teacher who is able to master the material that will be delivered and then can present it well in the classroom. This is in accordance with Slavin's opinion as quoted by Ruhadi, stating that effective teachers not only master the teaching materials they teach, but they can also communicate their knowledge to students. Therefore, the key to the teacher's authority and success depends on his mastery of the material and his ability to present the material (Ruhadi, 2008).

Students at SMK Muhammadiyah Ambon can be categorized as heterogeneous, meaning heterogeneous in terms of gender, social and economic level, academic achievement or ability, and ethnicity. In addition, the condition of students in the school showed that the results of learning mathematics under the criteria of minimum completedness (KKM < 65). Similarly, the results of interviews with teachers of math subjects, from the results of the interview was obtained that the average test scores of students in math lessons are still low or below the criteria of minimum completedness. The low value is thought to be influenced by several factors, including incomplete school facilities and infrastructure as well as interest and motivation in learning mathematics which is a factor in the low grades of students at SMK Muhammadiyah Ambon.

In order for learning activities and learning objectives to be realized, interesting methods are needed in the learning process. The learning method must make the student active in the learning process, because the activeness of the student can affect the learning outcomes. In addition, learning methods must be able to facilitate students to achieve learning objectives optimally. Because learning methods involve students in a challenging and fun learning process. Thus, learning methods can reduce or even eliminate the psychological burden of students, so that it will streamline as well as streamline teaching and learning activities in the classroom. Effective and efficient learning requires compact cooperation between teachers and students. In the learning process, there must be intensive interaction between various components of the learning system (teachers, students, learning materials, and the

environment) this situation can be done by developing and applying learning. The criteria for the learning model are part of Cooperative Learning.

Jigsaw type cooperative learning model is a learning in which there are groups of origin and expert groups. The original group was a parent group of students with diverse abilities, origins, and family backgrounds. The original group is a combination of several experts. A group of experts is a group of students consisting of members of different origin groups assigned to study and explore certain concepts and complete tasks related to the concept to be explained to the original group members.

METHOD

This type of research is quantitative correlational with the aim to know the relationship of jigsaw-type cooperative learning with student learning outcomes. The population in this study is all students of grade XI SMK Muhammadiyah Ambon which amounts to 53 people and consists of grade XI1 with a total of 28 students, grade XI2 with a total of 29 students. Sampling techniques in this study using Random Sampling where, the sampling process is done randomly between class XI1 and XI2. Based on the results of sampling obtained grade XI1 which was sampled in this study with a total of 28 students. The variables in this study consisted of two, namely free variables (X): Jigsaw-type cooperative learning and bound variables (Y): Student learning outcomes. The instruments used in the research are tests and questionnaires. The questionnaire used in this study is using a closed questionnaire, and compiled using a Likert scale with 5 choices of answers. The weighting of the questionnaire score is as follows.

Positive Statement		Negative Statement		
Answer Options	Score	Answer Options	Score	
Very Agree	5	Very Agree	1	
Agree	4	Agree	2	
Less Agree	3	Less Agree	3	
Disagree	2	Disagree	4	
Very Disagree	1	Very Disagree	5	

 Table 1. Weighting Poll Score

(Source Riduwan, 2012)

Descriptive Statistical Analysis

Test results obtained by students in the learning process using jigsaw-type cooperative learning are presented in a frequency distribution table so as to illustrate the position of a

student's overall value. The assessment guidelines used in this study are benchmark benchmark assessment guidelines for assessing test results.

Interval		Qualifications	
Numbers	Category		
80 - 100	А	Good of all	
66 - 79	В	Good	
56 - 65	С	Good Enough	
40 - 55	D	Not Good	
0-39	E	Failed	

 Table 2. Benchmark Reference Assessment Guidelines

Data Normality Test

Data normality test is done to find out whether or not the data obtained from the sample. Data normality test is done by using chi-squared test with formula:

Description: x^2 = Chi-kuadrat f_0 = Observation frequency f_t = Expected frequency (Sudijono, 2011)

Homogeneity Test

Homogeneity test is done by using the formula:

 $F = \frac{\text{varians besar}}{\text{varians terkecil}} \text{ atau } F = \frac{S_1^2}{S_2^2}.$ (2)

Product Moment Correlation Analysis

Analyzing data obtained from test results and questionnaires shared with learners using

Product Moment Correlation analysis with the formula:

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{(N\sum X^2 - (\sum X)^2)(N\sum Y^2 - (\sum Y)^2)}}.$$
(3)

Dimana

 r_{xy} = correlation coefficient between veriabel X and variable Y

 $\sum X$ = poll results

 $\overline{\Sigma} Y$ = student learning outcomes

 $\sum XY$ = number of multiplication results of each score of X and Y

N = many research samples

The r_{xy} value is interpreted against the correlation coefficient obtained by the following criteria:

Table 3. Interpretation of r value.			
Product Moment (r _{xy})	Interpretation		
0,00 sampai 0,199	Between X and Y the correlation is very low		
0,20 sampai 0,399	Between X and Y the correlation is weak		
0,40 sampai 0,699	Between X and Y the correlation is moderate		
0,70 sampai 0,899	Between X and Y the correlation is strong		
0,90 sampai1,00	Between X and Y the correlation is very strong		
(Source: Sudijono 2011)			

Table 2 Intermetation of a web

(Source: Sudijono, 2011)

RESULTS

The learning outcomes of learners obtained by learners after carrying out learning using jigsaw-type cooperative learning models can be seen in the following table.

Qualifications	Frequency	Percentage	Letter Value	Predicate
80 - 100	12	42,86%	А	Good of all
66 – 79	11	39,29%	В	Good
56 - 65	5	17,86%	С	Good Enough
40 - 55	0	0,00%	D	Not Good
0-39	0	0,00%	E	Failed
Jumlah	28	100%		

Table 4. Final Test Result Data of Learner
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Source : Learner learning outcomes

Based on table 4.16 it can be known that after carrying out the learning using a cooperative learning model jigsaw type of learning results obtained by learners after carrying out the test obtained excellent results. Of the 28 students who took the test, the students who obtained the results of learning with excellent predicate amounted to 12 people (42.86%), students who obtained good predicates amounted to 11 people (39.29%), and the number of students who obtained learning results with a predicate of 5 people (17.86%), and no students who obtained test results in the category of less and failed.

Data Normality Test

Data normality test is done to test the normality of data obtained during the research process, namely data obtained in the questionnaire results and test results. Data normality test is done as a pre-condition test before doing hypothesis testing. Based on the results of data analysis using chi-squared formula obtained:

- a. On variable X obtained value $X^2 = 7,299 \text{ dan } X_{table}^2 = 9,488$, thus the $X^2 < X_{table}^2$ or 7,299 < 9,488. Thus it can be concluded that the X variable data is distributed normally.
- b. On variable Y obtained value $X^2 = 7,05 \text{ dan } X_{table}^2 = 9,488$, thus the $X^2 < X_{table}^2$ or 7,05 < 9,488. Thus it can be concluded that the Y variable data is distributed normally.

Uji Homogenitas Data

Data homogeneity test is done to find out whether or not homogeneous data obtained in the implementation of research process. Based on the test results obtained that the value of Fhitung is 1.13. While the F_{table} value is 1.88. Thus it can be said that the value of $F < F_{table}$ or 1.13 < 1.88. Based on the above test criteria, it can be concluded that the data obtained is homogeneous.

Hypothesis testing

Testing the hypothesis in this study is to use the product moment correlation formula. Results of correlation analysis of cooperative learning model relationship jigsaw type (Variable X) with learner learning outcomes (Variable Y)

Table 5. Conclation analysis results				
Variable	r	rtable		
		5%	1%	
X and Y	0,8374	0,374	0,478	

Table 5. Correlation analysis results

Based on the table above, it can be known that there is a relationship of jigsaw-type cooperative learning model with students' learning outcomes on opportunity materials in grade XI smk Muhammadiyah Ambon. This is evidenced by the results of product moment correlation analysis between variable X and variable Y which is then consulted with the r_{table} value at a real level of 5% and 1%. So it is clearly visible $r_{value} = 0,8374$, and $r_{table} 5\%$ with N = 28 is 0,374. From the interpretation table the $r_{value} = 0,374$ fall into a strong or high category.

Based on the Coefficient of Determination = $r^2 \times 100\%$, the coefficient of determination is obtained by 70,12%. Thus, the relationship between jigsaw-type cooperative learning model and student learning outcomes in the opportunity material in grade XI SMK Muhammadiyah Ambon amounted to 70,12%. While 29,88% is determined by other factors. The test results were through r_{xy} correlation test = 0,8374. To prove the hypothesis is rejected or accepted by criteria if $r \le r_{table}$ then Ho is accepted and Ha is rejected, on the contrary $r \ge r_{table}$ then Ho is

7

rejected and Ha is accepted. Thus r_{table} 5% with N = 28 is 0,374, so it can be written into r \geq r_{table} or 0,8374 \geq 0,374. Based on the data, it can be concluded that Ha is accepted, so that it can be concluded that "there is a strong relationship between the type i cooperative learning model and the students' learning outcomes in the opportunity material in grade XI SMK Muhammadiyah Ambon".

DISCUSSION

Learning carried out with jigsaw-type cooperative learning models in this learning students look so active and highly motivated to participate in learning activities. The learners seemed very enthusiastic to participate in the learning activities and felt responsible, because in their learning each student was directly involved in the learning and each student was given the responsibility to complete their respective tasks.

Based on the results of the research obtained from the student test results, it was seen that in the implementation of the final test using cooperative learning model jigsaw type obtained a relatively good test results. This is evidenced from the results of the final test, namely from 28 students who took the final test, students who obtained test results in an excellent category of 12 people or with a percentage of 42,86%, the number of students who obtained test results in the category either amounted to 11 people or with a percentage of 39,29%, students who obtained test results in the category of 5 people or with a percentage of 17,86% and no students who obtained test results in the category of less and failed. The results showed that the learning process using jigsaw-type cooperative learning models obtained better test results. This is because the learning process using cooperative learning model jigsaw type students are more active in the learning process.

Based on the results of the hypothesis test using correlation test Products moment r_{value} of 0,8374. While the conversion results based on the table of r_{table} value distribution is obtained r_{table} value at the level of 5% which is 0,374 so that it can be concluded that there is a strong relationship between the jigsaw type cooperative learning model to student learning outcomes on the concept of opportunity in grade XI SMK Muhammadiyah Ambon. Based on the data, it can be concluded that Ha is accepted, so that it can be concluded to be "the relationship between cooperative learning model type and student learning outcomes in the opportunity material in grade XI SMK Muhammadiyah Ambon" with a strong or high category.

CONCLUSION

Based on the results of the research conducted, it can be concluded that there is a strong relationship between jigsaw-type cooperative learning models and student learning outcomes in the opportunity material in grade XI smk Muhammadiyah Ambon. This is based on hypothetical test results using products moment correlation test obtained by r of 0,837. The relationship of jigsaw-type cooperative learning model in the opportunity material in class XI SMK Muhammadiyah Ambon is based on the results of correlation coefficient calculation of 0.837.

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9

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