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The Effect of Giving Pre-Test and Postest on Learning Outcomes of the AMIK Medicom Student Research Methods

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ARTICLEINFO

Article history:
Received: 12/07/2020
Revised: 22/08/2020
Accepted: 30/09/2020

Keywords : Pre-Test, Post-Test and Learning Outcomes

ABSTRACT

This study aims to determine the effect of giving a pre-test and post-test on the learning outcomes of AMIK MEDICOM student research methods. This study uses three variables consisting of one dependent variable, namely Learning Outcomes (Y), while the independent variable is Pre-Test (X1) Post-Test (X2). The type of research used is explanatory research through associative research, namely research that aims to explain the influence between two or more variables. In this study, the population is students of the Academy of Informatics and Medicom Computers with Informatics Management Study Program Level 2 (two) semester 4 who study at Jl. Land No. 74 Medan totaling 254. The sample in this study was 30% of the population, namely 76 people. The data collection method was done by using a questionnaire and literature study. Data analysis was performed by testing data quality (validity and reliability), classical assumption test, t test (partial test), F test (simultaneous test).

1. Introduction

In the teaching and learning process, lecturers as teaching staff need to know the extent of students 'initial knowledge and students' final knowledge after being given learning. That is why lecturers need to give tests to students to find out students' abilities in order to achieve learning goals. As for the function of the test is as a measuring tool for students and as a means of measuring the success of the teaching program, because through these tests it can be seen how far the learning objectives have been achieved.

To find out and measure the extent to which students' initial abilities in receiving the material to be taught, lecturers need to give pre-tests to students. The pre-test is intended so that students are ready to receive the material to be taught and can play an active role in the teaching and learning process. While giving the post-test is done to find out the extent to which students capture and apply the concepts received during teaching and learning activities.

The pre-test conducted on students will make the lecturer aware of the difficulties experienced by each student, so that the lecturer can adjust the lecture material to the level of difficulty experienced by each student, so that students easily catch the material to be taught.

To determine the level of mastery of student material on each lecture material, it is important to do a postest at the end of the lecture, besides that the lecturer also knows the materials that need to be repeated if there are certain parts that have not been mastered by the students.

2. Study of Learning Outcomes Theory

2.1 Understanding Learning

Moh. Surya quoted by Nana Sudjana (2005: 22) defines learning as a business process carried out by individuals to obtain a whole new behavior change, as a result of the individual's own experiences in their interactions with the environment.

2.2 Learning Outcomes of Research Methods

According to Hamalik (2007: 31) states, "the results of learning patterns of actions, values, understandings, attitudes, appreciation, abilities and skills". Furthermore, Nana Sudjana (2005: 20) the essence of learning outcomes is a change in individual behavior which includes cognitive, affective and psychomotor aspects.

DIn the national education system, the formulation of educational goals, both curricular and instructional, uses the learning outcomes of Bloom (Purwanto, 2008: 50) which broadly divides them into three domains, namely the cognitive, affective and psychomotor domains.

KThe three domains above are the object of assessment of learning outcomes. Then it can be concluded that learning outcomes are changes in behavior that occur after participating in the teaching and learning process in accordance with predetermined goals. Humans have the potential for psychological behavior that can be educated and their behavior changes, which include cognitive, affective, and psychomotor aspects.

Learning outcomes are translated into scores or numbers which indicate the higher the student's score the higher the success rate in the learning process. Likewise, on the contrary, the lower the score of a student shows the lack of success of the student in the learning process he is doing. And to find out how far the achievement is, a tool in the form of a learning outcome test is used.

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2.3 Pre-Test and Post-Test Theory Study

According to Muhibbin Syah (2006: 199) Pre-test is a test given before the learning process. The goal is to identify the level of knowledge of students about the material or material to be presented.

According to Ngalim Purwanto (2004: 28) post-test is a test that is given at the end of the learning process.

2.4 Framework of thinking

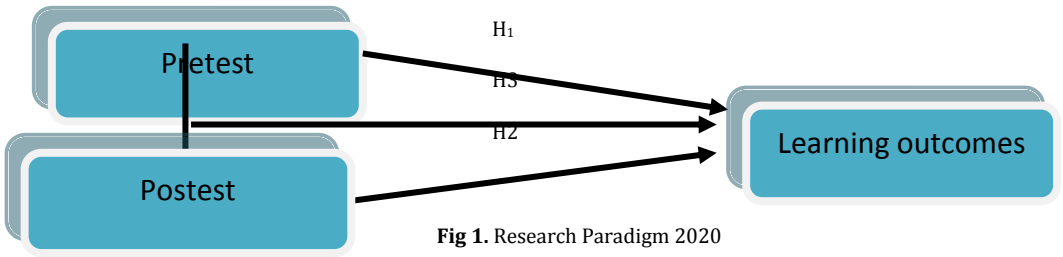

Fig 1. Research Paradigm 2020

2.5 Research Hypothesis

A. Pretest has a positive and significant effect on the learning outcomes of AMIK MEDICOM students' research methods.
B. Postest has a positive and significant effect on the learning outcomes of AMIK MEDICOM students' research methods.
C. Pretest and posttest have a positive and significant effect on the learning outcomes of AMIK MEDICOM students' research methods.

3 Research methodology

3.1 Types of research

This study intends to test hypotheses in the hope of confirming or strengthening the formulated assumptions which in turn can support the theory. On the basis of these assumptions, the type of research used includes explanatory research, namely research that aims to explain the effect of two or more variables Sugiyono (2017: 95).

3.2 Location and Time of Research

The location where this research was conducted is the campus of the Academy of Informatics and Medicom Computers, which is located at Jl. Land no. 74 Medan. The research time is planned to be carried out for 8 (eight) months, namely monthsJanuary 2020 to August 2020.

3.3 Population and Sample

In this study, the population is students of the Academy of Informatics and Medicom Computers with Informatics Management Study Program Level 2 (two) semester 4 who study at Jl. Land No. 74 Medan, amounting to 254, sampling in this study was 30% of the population, namely 76 people.

3.4 Method of collecting data

The data collection techniques in this study are as follows:

A. Observation
B. Literature
C. Documentation

4 Research Results and Discussion

4.1 Research result

A. Reliability and Validity Test

1) Test of reliability and validity of pre-test variables

2)

Table 1
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.918	.918	10

Source: SPSS Version 17 Results

Based on table 1 the results of the reliability test show that the cronbach's alpha value on the questions contained in the research questionnaire is 0.918, this result shows that the cronbach's alpha value is> 0.60 so it can be concluded that the reliability of these questions is very high.

Table 2
Test the validity of the pre-test instrument

Variable	R count	R table	Information
PR1	0.926	0.22227	Valid
PR2	0.850	0.22227	Valid
PR3	0.710	0.22227	Valid
PR4	0.794	0.22227	Valid
PR5	0.828	0.22227	Valid
PR6	0.454	0.22227	Valid

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Variable	R count	R table	Information
PR7	0.926	0.22227	Valid
PR8	0.480	0.22227	Valid
PR9	0.839	0.22227	Valid
PR10	0.770	0.22227	Valid

Source: Validity Test Results (2020)

From the table above, it can be seen that the value of r count> r table where the value of r table with N = 76 at a significance of 0.05, then the r table is 0.2227. Thus the results of the analysis of the validity test show that rcount is greater than the value of rtable so that it can be said to be valid or worthy of being used as a research questionnaire.

3) Test of reliability and validity of post-test variables

Table 3
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.909	.908	10

Source: SPSS Version 17 Results

Based on table 3, the results of the reliability test show that the cronbach's alpha value on the questions contained in the research questionnaire is 0.909, this result shows that the cronbach's alpha value is> 0.60 so it can be concluded that the reliability of these questions is very high.

Table 4
Test the validity of the Post-test Instrument

Variable	R count	R table	Information
PO1	0.744	0.22227	Valid
PO2	0.516	0.22227	Valid
PO3	0.825	0.22227	Valid
PO4	0.472	0.22227	Valid
PO5	0.887	0.22227	Valid
PO6	0.765	0.22227	Valid
PO7	0.841	0.22227	Valid
PO8	0.819	0.22227	Valid
PO9	0.811	0.22227	Valid
PO10	0.645	0.22227	Valid

Source: Validity Test Results (2020)

From table 4 above, it can be seen that the value of r count> r table where the value of r table with N = 76 at a significance of 0.05, then the r table is 0.2227. Thus the results of the analysis of the validity test show that rcount is greater than the value of rtable so that it can be said to be valid or worthy of being used as a research questionnaire.

4) Test the reliability and validity of learning outcomes

Table 5
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.906	.901	10

Source: SPSS Version 17 Results

Based on table 5 the results of the reliability test show that the cronbach's alpha value on the questions contained in the research questionnaire is 0.906, this result shows that the cronbach's alpha value is> 0.60 so it can be concluded that the reliability of these questions is very high.

Table 6
Test the Validity of the Learning Outcomes Instrument

Variable	R count	R table	Information
HB1	0.752	0.22227	Valid
HB2	0.898	0.22227	Valid
HB3	0.830	0.22227	Valid
HB4	0.587	0.22227	Valid
HB5	0.950	0.22227	Valid
HB6	0.458	0.22227	Valid
HB7	0.784	0.22227	Valid
HB8	0.707	0.22227	Valid
HB9	0.824	0.22227	Valid
HB10	0.468	0.22227	Valid

Source: Validity Test Results (2020)

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From table 6 it can be seen that the value of r count> r table where the value of r table with N = 76 at a significance of 0.05, then the r table is 0.2227. Thus the results of the analysis of the validity test show that rcount is greater than the value of rtable so that it can be said to be valid or worthy of being used as a research questionnaire.

B. Classical Assumption Test Analysis

1) Normality test

The normality test aims to test whether in the regression model, confounding or residual variables have a normal distribution. To detect whether the residuals are normally distributed or not by graph analysis (Ghozali, 2006).

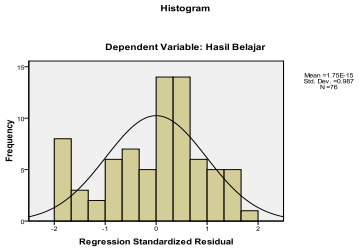

Fig 2. Normality Test Histogram
Source: SPSS Version 17 Results

Based on the Histogram graph, it is known that the data distribution spreads to all areas of the normal curve. It can be concluded that the data has a normal distribution.

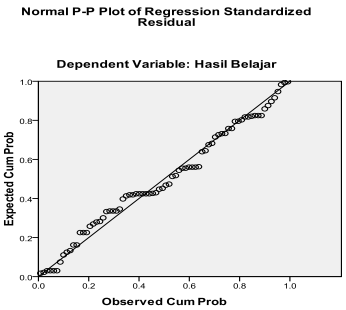

Fig 3. Variable Data Normality Test
Source: SPSS Version 17 Results

From the results of data processing using SPSS Ver.17 as shown in Figure 3 above, that the point spreads normally around the diagonal line and follows the direction of the diagonal line, meaning that the regression model is suitable for predicting the dependent variable (Learning Outcomes) based on the input of the independent variables. namely Pre-test and Post-test. If the data spreads around the diagonal line and follows the diagonal line, the regression model fulfills the normality assumption.

Table 7
One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		76
Normal Parametersa ,, b	Mean	.0000000
	Std. Deviation	2.02147651
Most Extreme Differences	Absolute	.113
	Positive	.072
	Negative	-113
Kolmogorov-Smirnov Z		.983
Asymp. Sig. (2-tailed)		.288
a. Test distribution is Normal.		
b. Calculated from data.		

Source: SPSS Version 17 Results

Based on table 7, it can be seen that the asymp.sig (2-tailed) value is 0.288> significant (0.05) so that it meets the requirements of the normality test, which is if it is significant (0.05), thus that the entire study population comes from data that is normally distributed , so it can be concluded that these variables have a significant relationship.

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2) Heteroscedasticity Test

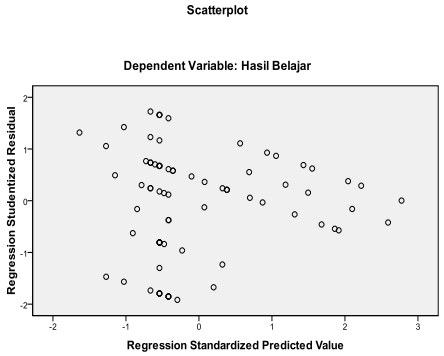

Fig 4. Heteroscedasticity Test
Source: SPSS Version 17 Results

From the results of data processing using SPSS Ver. 17 as shown in Figure 4 above, that the dots spread randomly and are spread both above and below the number 0 on the Y axis, it can be concluded that there is no heterocedacity in the regression model, it is feasible to be used to predict the dependent variable (Learning Outcomes) based on the input of independent variables Pre-test and Post-test.

3) Multicollinearity Test

The multicollinearity test aims to test whether the regression model found a correlation between the independent variables (independent). A regression model can be said that there is no multicollinearity if the results of the calculation of the Tolerance value> 0.10 and the Variance Inflation Factor (VIF) value <10 (Ghozali, 2006)

Table 8
Multicollinearity Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	52,760	2,095		25,188	.000		
	Pretest	.062	.047	.157	3,300	.008	.751	1,331
	Postest	.187	.045	.505	4,184	.000	.751	1,331

a. Dependent Variable: Learning Outcomes

Source: SPSS Version 17 Results

From the results of data processing using SPSS Ver. 17 as shown in table 8 above, it can be seen that the variable tolerance value (X1) and (X2) is 0.751 and the VIF value of the variables (X1) and (X2) is 1.331, that there is no correlation between the independent variables. The regression model is free from multicollinearity problems because the value of Variance Inflation Factor (VIF) = 1.331 <10 and the value of Tolerance = 0.751> 0.10. This indicates that the pre-test and post-test do not contain symptoms of multicolinearity.

4) Linearity Test

Linearity test was conducted to determine whether there was a linear relationship between the two research variables. The linear relationship illustrates that changes in the predictor variable will tend to be followed by changes in the criterion variable by forming a linear line. The criteria for seeing whether the two variables are linearly related or not are as follows:

a) Jif the P score <0.05 then the two variables are declared linear.
b) Jif the P score> 0.05 then the two variables are declared non-linear.

PeThe calculation of the linearity test for the relationship in this study used the statistical package for science (SPSS VER 17) computer program. The linearity test of the relationship between the pre-test variables and the learning outcomes resulted in a value of F = 3.462 with P = 0.002 (p <0.05). The results of the linearity test for the two variables can be seen in the following table:

Table 9
Pre-test Variable Linearity Test Results

			Sum of Squares	df	Mean Square	F	Sig.
Learning Outcomes * Pretest	Between Groups	(Combined)	43,084	16	2,693	.467	.003
		Linearity	3,462	1	3,462	.600	.002
		Deviation from Linearity	39,622	15	2,641	.458	.952
	Within Groups		340,337	59	5,768		
	Total		383,421	75			

Source: SPSS Version 17 Results

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From table 9, the results of the linearity test show that the relationship between the two variables is linear, where the Pre-test variable on the Learning Outcomes variable produces a value of F = 3.462 with P = 0.002 (p <0.05).

Table 10
Post-test Variable Linearity Test Results

			Sum of Squares	Df	Mean Square	F	Sig.
Learning Outcomes * Postest	Between Groups	(Combined)	106,209	15	7,081	1,533	.003
		Linearity	69,846	1	69,846	15,118	.000
		Deviation from Linearity	36,363	14	2,597	.562	.883
	Within Groups		277,212	60	4,620		
	Total		383,421	75			

Source: SPSS Version 17 Results

From table 10, the results of the linearity test show that the relationship between the two variables is linear, where the Post-test variable on the Learning Outcomes variable produces a value of F = 15,118 with P = 0,000 (p <0.05).

4.2 Analysis of Correlation and Regression Between Variables

Multiple Regression Analysis is used to determine how much influence the independent variable has on the dependent variable. Here's the regression equation:

Table 11
Multiple Linear Regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	52,760	2,095		25,188	.000
	Pretest	.062	.047	.157	3,300	.008
	Postest	.187	.045	.505	4,184	.000
a. Dependent Variable: Learning Outcomes						

Source: SPSS Version 17 Results

Table 11 shows that the Multiple Regression Equation Model (Y = A + B1X1 + B 2X2 + e) in this study is Y = 52,760+ 0.062 X1 + 0.187 X2 + 0.

4.3 Hypothesis testing

1) T test (partial test)

The t test used is the one-way test with α = 5%, then the 5% t-test (73) is 1.666

Table 12
-T Test (Partial)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	52,760	2,095		25,188	.000
	Pretest	.062	.047	.157	3,300	.008
	Postest	.187	.045	.505	4,184	.000
a. Dependent Variable: Learning Outcomes						

Source: SPSS Version 17 Results

Table 12 shows that:

a) The pre-test variable t-count value is 3,300 while the t-table value is 1.666. This means that tcount> ttable, namely 3,300> 1,666 with a significant value of 0.05. Based on these data, it can be concluded that the pre-test variable by means of the t test (partial test) has a positive value as indicated by a unidirectional relationship with the Learning Outcomes variable and has a significant effect so that H0 is rejected and H1 is accepted, meaning that the Per-test has a significant effect on Learning Outcomes.

b) The tcount of the Post-test variable is 4.184 while the t-table is 1.667. This means that tcount> ttable is 4.184> 1.666 with a significant value of 0.05. Based on these data it can be concluded that the Post-test variable by means of the t test (partial test) has a positive value which is indicated by a unidirectional relationship with the learning outcomes variable and has a significant effect so that H0 is rejected and H1 is accepted, meaning that the Post-test has a significant effect on Learning Outcomes.

2) F Test (Simultaneous Test)

The F test used is a one-way test with α = 5%, then Ftable 5% (2; 73) is 3.12.

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Table 13
F test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76,944	2	38,472	9,164	.000a
	Residual	306,478	73	4,198		
	Total	383,421	75			

a. Predictors: (Constant), Postest, Pretest

b. Dependent Variable: Learning Outcomes

Source: SPSS Version 17 Results

Table 13 shows that the pre-test and post-test variable Fcount value is 9.164 while Ftable is 12. This means that Fcount> Ftable, namely 9.164> 3.12. Based on these data, it can be concluded that the pre-test and post-test variables by means of the F test (simultaneous test) are positive which is indicated by a unidirectional relationship with the learning outcome variable and has a significant effect, so that H0 is rejected and H1 is accepted.

4.4 Discussion of Research Results

Based on the results of the analysis test using the help of the SPSS version 17 program, the following results were obtained:

4.5 Effect of Pre-test and Post-test on Learning Outcomes

The results of quantitative analysis with linear regression test using F_test analysis also prove that F_count is 9.164 and F table is 3.12. Thus it can be concluded that the two independent variables Pre-test (X1) and Post-test (X2) simultaneously have a significant effect on the dependent variable Y (learning outcomes).

To improve the learning outcomes of AMIK MEDICOM student research methods, one of which needs to be improved in the lecture process is by giving a pre-test at the beginning of the lecture and giving a post-test at the end of the lecture.

The results of this study are in accordance with the research of Zulkarnain and Sugeng Widodo in their research entitled "The Effect of Pre-test and Postest Giving on Geography Learning Achievement. SMA Bina Mulya Bandar Lampung, Academic Year 2012-2013",

Based on the results of the above discussion that the findings and related theoretical studies, the researcher concluded that there was no deviation between the research findings and the related theoretical studies. The results of this study prove that the provision of pre-test and post-test will motivate and increase the chances of increasing or improving the learning outcomes of the AMIK MEDICOM student method so that the course objectives will be achieved effectively and efficiently as determined.

5 Conclusion

1) The pre-test has a significant effect on the learning outcomes of AMIK MEDICOM students' research methods.
2) Postest has a significant effect on the learning outcomes of AMIK MEDICOM students' research methods.
3) Pretest and posttest have a significant effect on the learning outcomes of AMIK MEDICOM students' research methods.

Thanks to :
1) AMIK Medicom Medan
2) DPRM and Kemdikbud of the Republic of Indonesia who have supported the implementation of this research
3) Researcher's family and friends.

6 References

[1] Anas Sudjono (2001) Introduction to Educational Evaluation. Jakarta: RajaGrafindo
[2] Arikunto, S. (2012) Research Procedures for a Practical Approach, Rineka Cipta, Yogyakarta.
[3] Dalyono, M. (2009). Educational Psychology. Jakarta: Rineka Cipta.
[4] Double. (2004) Practical Instructions for How Students Study in Higher Education. Jakarta: Grasindo.
[5] G.hozali, priest. 2006. Application of Multivariate Analysis with the SPSS Program. Third Edition. Semarang: Diponegoro University Publishing Agency.
[6] Hamalik, Oemar. (2007). Curriculum Evaluation of a systematic approach. Bandung: Integrated Al Madani Foundation.
[7] Manullang, Marihot & Pakpahan, Manimbing. 2014 Research Methodology: Practical Research Process. Ciptapustaka Media: Bandung
[8] Misbahudin, Iqbal Hasan. (2013). Research Data Analysis With statistics, Jakarta: Earth Literacy.
[9] Mulyasa. 2008. Implementation of Education Unit Level Curriculum. Jakarta: PT. Earth Literacy
[10] Sujana, Nana. (2005). Basics of Teaching and Learning. Bandung Sinar Baru Algensindo.
[11] Purwanto. (2008). Evaluation of Learning Outcomes. Surakarta: Student Library.
[12] Suparwoto. (2004). Basic Teaching Skills. Yogyakarta: FIB Yogyakarta State University.
[13] Slameto. (2003). Learning and the factors that influence it. Jakarta: Rineka Cipta.
[14] Sujana. 2005. Statistical Methods Bandung: Tarsito
[15] Sugiyono. (2014). Qualitative quantitative research and combination (Mixed Method) Bandung: Alfabeta.
[16] _____ ,. 2017. Educational Research Methods: Quantitative Approaches, Qualitative, and R & D. Bandung: Publisher Alphabet_____, 2005 Business Research Methods. Bandung: CV. Alfabeta