The Impact Of Students' Creativity And Perceptions Of Linear Program Courses Toward Learning Achievement

Astuti Arigiyati, Annis Deshinta Ayuningtyas, Tias Ernawati, Benidectus Kusmanto
{astuti@ustjogja.ac.id[1], annis_deshinta@yahoo.com[2], tias.ernawati@ustjogja.ac.id[3], kusmanto@ustjogja.ac.id[4]}

Universitas Sarjanawiyata Tamansiswa, Yogyakarta, Indonesia[1,2,3,4]

Abstract. The objective of this study is to determine the impact of students' creativity and perceptions of a linear program toward learning achievement both partially and simultaneously. This study used a quantitative research commonly called an ex post facto research. The sample involved 82 students of mathematics education department. Data collection techniques included documentation, tests and questionnaires. The data were analyzed by using a multiple linear regression. The results of a multiple regression analysis showed that the sig = 0.000 <α = 0.005, meaning that there is a significant impact between creativity and students' perceptions of a linear program toward learning achievement. In addition, the regression analysis partially produced the sig = 0.005 <α = 0.005 and sig = 0.027 <α = 0.005, meaning that that there is a significant impact between creativity and a linear program toward learning achievement and there is a significant impact between students' perceptions and a linear program toward learning achievement.

Keywords: creativity, students, perceptions, learning achievement

1 Introduction

The basic principles of teaching and learning activities in the 2015 curriculum are to empower all the potentials that students have, develop students' innovation and creativity, create fun and challenging conditions, develop diverse abilities that contain values, provide diverse learning experiences, and learn by doing. Students are expected to be able to understand mathematical concepts by using their own abilities independently. Students are active in solving problems ranging from understanding problems to finding out solutions to such problems.

The facts in the field indicate that students' learning achievement has not been maximized. This can be seen through a number of students who repeat lectures in several courses. Many students fail in a linear program course. Whereas linear program courses are quite important when they become mathematics teachers at high school/vocational high school levels, the mathematics education study program teaches about linear programs. In addition, linear program courses are a requirement to study operational research courses.

According to Munandar translated [1], creativity is the ability a) to create new combinations based on existing information data or elements, b) available data or information can be used to find out many possible answers to a problem whereas the emphasis is on the quality, the usefulness and diversity of answers, c) reflecting the smoothness, flexibility, and

ICSTI 2019, September 20, Yogyakarta, Indonesia

DOI 10.4108/eai.20-9-2019.2292116

originality of thinking and the ability to elaborate an idea. Alma (2007) in [2] adds that creativity is the ability of a person to give birth to something new, both in the form of ideas and real work, which is relatively different from what has been produced or delivered.

Besides creativity, students' perceptions also affect mathematics learning achievement. Students' perceptions assume that mathematics is a difficult lesson that will make students avoid or leave mathematics courses resulting in low mathematics learning achievement. Perception is the experience of objects, events, or relationships obtained by inferring information and interpreting messages [3]. A perception, according to M. Toha (2009) in [4], deals with factual results after students receive a stimulus or a pattern of stimuli from their environment. A perception is essentially a cognitive process experienced by everyone in understanding information about their environment. A perception is regarded as the initial activity of a person's cognitive structure. The negative perception of students who think mathematics is a difficult lesson must be eliminated. Students who consider abstract mathematics must be explained further to take advantages of learning mathematics for everyday life. Regardless of mathematics, a positive perception will motivate students to be more active in learning and will make them feel happy in learning, so they will think learning is a need that must be met.

Based on etymology, Mathematics means the knowledge gained from reasoning [5]. Djamarah in [6] said learning achievement is the result obtained in the form of impressions that result in changes in the individual as a result of learning activities.

2 Research Method

A quantitative research is ex post facto in nature. An ex post facto (after the fact) research is a study whose independent variables have been treated or not undertaken at the time of research [7]. This study used two kinds of variables, namely independent variables and dependent variables. The independent variable is a variable that affects or causes changes or the emergence of the dependent variable. The independent variable in this study is a student's creativity (X1) and a student's perception (X2). Moreover, the dependent variable is a variable that is affected or that results from an independent variable. The dependent variable in this study is students' mathematics learning achievement (Y).

The sample involved 82 third semester students of mathematics education department of the 2017/2018 Academic Year who took linear program courses. Data collection techniques included documentation, tests and questionnaires. The data analysis technique used a multiple linear regression analysis.

Data analysis techniques included both a descriptive analysis and a multiple linear regression analysis. Descriptive analysis techniques are used to determine the tendency of research variables. In this study, the ideal curve approach is used, as follows [8], see table 1.

In terms of a multiple linear regression analysis, the assumption is tested first, namely normality test, linearity test and multicollinearity test. To predict the impact of the independent variable along with the dependent variable, it is determined the same as a multiple regression along with three predictors first [9], see equation (1)

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 \quad (1)$$

Table 1. The Ideal Curve's Level Of Tendency

No.	Average	Classification
1	(M+1.5SD) < $\bar{X}$	Highest
2	(M+0.5SD) < $\bar{X}$ ≤ (M+1.5SD)	High
3	(M-0.5SD) < $\bar{X}$ ≤ (M+0.5SD)	Average
4	(M-1.5SD) < $\bar{X}$ ≤ (M-0.5SD)	Low
5	$\bar{X}$ ≤ (M-1.5SD)	Lowest

Information:
$\bar{X}$ = Observation mean
M = Average ideal
SD = Ideal standard deviation

3 Results And Discussion

The descriptive data analysis is used to determine the tendency of the research variables, namely the creativity variable, the students' perceptions of linear program courses variable and the mathematics learning achievement variable. The calculation of a descriptive analysis shows that the creativity of students' variable has an average value of 121.89 (a high category) and the range of 116.69 to 140.07. The calculation on the variable of students' perceptions of linear program courses have an average value of 137.39 (a high category), namely in the range of 116.69 to 140.07. The variable of mathematics learning achievement has an average value of 58.52 (a high category), namely in the range 58.35 to 75.05.

The research data analysis is used to test the positive impact between creativity (X1) and students' perceptions (X2) and the dependent variable is learning achievement (Y). To test this hypothesis, assumptions are first tested, namely normality test, linearity test, and multicollinearity test. Normality test aims to determine whether or not the regression model, error or residual variables have a normal distribution. There are two ways to detect whether residuals are normally distributed or not, namely by a graph analysis and statistical tests. In this study, the normality test uses a Kolomogorov-Smirnov Test to obtain the significance value of 0.200> 0.05, which means that the data are normally distributed.

After testing the normality of sampling data, a linearity test is conducted to determine whether two variables have a significant linear relationship or not. Good data will have a linear relationship between the independent variable (X) and the dependent variable (Y). The linearity test in Table 2 below can be seen from the results of a linearity test between the independent variable and the dependent variable.

Table 2. Summary Of Results Of Linearity Tests

Variable	Sig	α	Information
X1→Y	0.482	0.05	Linear
X2→Y	0.453	0.05	Linear

The next assumption test is a multicollinearity test that aims to test whether or not the regression model has a correlation between independent variables. A good regression model will not show a correlation between independent variables (there is no multicollinearity). To find out whether multicollinearity emerges or not, it is necessary to determine the Tolerance or

VIF value. A multicollinearity test shows that VIF = 1,099, the VIF value is less than 10, so that there is no multicollinearity in the tested data.

The calculation of a regression equation analysis, the multiple linear regression equation is obtained, as follows equation (2) :

$$Y = -41{,}960 + 1{,}031X_1 + 0{,}367X_2 \quad (2)$$

The regression equation shows the value of a = intercept (constant) of -41.960, meaning that the constant is -41.960. The creativity and perception value is 0, and the value of mathematics learning achievement is -41,960. This means that mathematics learning achievement is low if it is not influenced by both independent variables, namely creativity and perception. The value of b1 = coefficient X1 is 1.031, meaning that each addition of 1 unit of creativity will increase 1.031 points of mathematics learning achievement. The value of b2 = X2 coefficient of 0.367 means each addition of one student's perception unit, and it will increase 0.367 points of the mathematics learning achievement.

The result of a major hypothesis analysis shows the sig = 0.000. The value of sig = 0.000 < α = 0.05, so that the creativity variable and the students' perceptions of linear program courses variable affect mathematics learning outcomes significantly. The result of a minor hypothesis analysis shows the sig value for the creativity coefficient of 0.005 and the sig value for the coefficient of students' perceptions of 0.027. Both of these sig values are smaller than the level of significance, so that the variables of creativity and students perceptions influence the mathematics learning outcomes significantly. This is consistent with the results of research [10] that students' perceptions of learning affect student achievement. Besides that, this results also consistent with the results of research [11] that learning creativity affects learning achievement.

The students' creativity and perceptions of the Linear Program course affect students' learning achievement. The increasing creativity of students results in the increasing scores of their learning achievement. Likewise, students' perceptions of linear program courses on learning achievement evidence that students need to have high creativity in learning. To improve creativity in learning, students should increase the practice of math problems in various ways of completion. In addition, students' perceptions of courses must also be good because this is very important to improve learning achievement. To improve students' perceptions of linear program courses, it is necessary to use the right teaching model or method in line with teaching materials. Students feel appreciated and cared for if the lecturer is close to them, so that they will be more receptive to such materials.

4 Conclusion And Suggestion

The results of the research and discussion can be concluded, as follows:

4.1. Major

There is a positive and significant impact between creativity and students' perceptions of the Linear Program courses in relation to the mathematics learning achievement. This is based on the sig value of 0,000 that is less than the level of significance of 5%.

4.2. Minor

1. There is a positive and significant impact between students' creativity and mathematics learning achievement. This is indicated by a sig value of 0.005 that is less than 5% of the significance level.
2. There is a positive and significant impact between students' perceptions of linear program courses and mathematics learning achievement. This is indicated by the sig value of 0.027 that is less than 5% of the significance level.

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