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The Impact of Online Learning through Students' Mathematical Habit of Mind

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abstract

THE IMPACT OF ONLINE LEARNING THROUGH STUDENTS' MATHEMATICAL HABIT OF MIND. Online learning became one of the most popular learning strategies during the pandemic of Covid-19 in every level of education in Indonesia. This type of learning strategy certainly has an impact on developing student's learning habit and also thinking habit. The impact of the implementation of online learning need to be measured to reveal the changes as the result of learning strategy which was adopted by the educators. This impact needs to be studied from the mathematical habit of mind as the point of view. The research method was survey research with population all students of mathematics education study program in Lampung University. Simple random sampling was used as the sampling technique to obtain 191 students in even semester of the 2019/2020 academic year as the sample. Data collected using questionnaire which measured variables self-perception mathematical habit of mind and implementation of online learning. Data analyzed using simple linear regression on $\alpha = 5\%$. Based on data analysis, it can be concluded that the equation of the regression that express the relationship of self-perception mathematical habit of mind (Y) and implementasion of online learning (X) is $Y = 0,246 X + 38,572$ which indicates that there are significant low impact of implementation of online learning on students self-perception mathematical habit of mind.

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Keywords:

Online Learning; Mathematical Habit; Student's Mind; Pandemic



Open Access

INTRODUCTION

Online learning became one of the most popular learning strategies during the pandemic of Covid-19 in every level of education in Indonesia. Online learning utilizes internet in designing the learning process because of the level of flexibility and also the function that make learning easy to do anytime and anywhere (Irawan, Susanti, dan Triyanto, 2015). Internet as the huge library on earth also believe as all-round learning resource with the smart engine machine on it which provides abundant information to be accessed easily in an attractive appearance (Putranti, 2013). This type of learning strategy certainly has an impact on developing student's learning habit and also thinking habit. The impact of the implementation of online learning need to be measured to reveal the changes as the result of learning strategy which was adopted by the educators.

Oxford learner dictionary (2020) define impact as the powerful effect that something has on somebody/something. The impact of the implementation of online learning could be measured in many aspect of learning output such as mathematical habit of mind (MHoM) as the point of view. This is important to be measured because of the characteristic of habit of mind as one of crucial variable that indicate students thinking behavior in solving problems through their own thoughts by utilizing the prominent information source effectively and engaging optimal efforts by improving their own evaluation standards. Ritchart & Tishman (Waryadi, Kadir, Rahayu, 2019) mentioned that MHoM is needs as thinking transition in studying higher-level material. Moreover, Setiawati (2014) give evidence about the association

between logical and creative thinking skills with students' MHoM behavior.

METHODS

The population in this research is all students of mathematic education study program in Lampung University. Simple random sampling was used as the sampling technique to obtain 191 students in even semester of the 2019/2020 academic year as the sample. This quantitative research described the relationship of self-perception MHoM (Y) and implementation of online learning (X).

Data collected using questionnaire which measured variables self-perception mathematical habit of mind and implementation of online learning. Using one shoot case study to identify the quality of research intruments, the research intrument has 24 items to measure self-perception MHoM and 30 items to measure the variable of implementation of online learning that has reliability coeficient in high category.

After data collected, data were converted using method of successive interval to gain interval scale, then analyzed using simple linear regression on $\alpha = 5\%$. The conversion process into intervale scales is needed to fulfil the prerequisite assumption of linear regresion test. Another assumption for simple linear regression is normality assumption for the residual. The residual data in this research has a normal distribution. This is based on the P-P Plotting on the residual values as illustrtated in Figure 1.

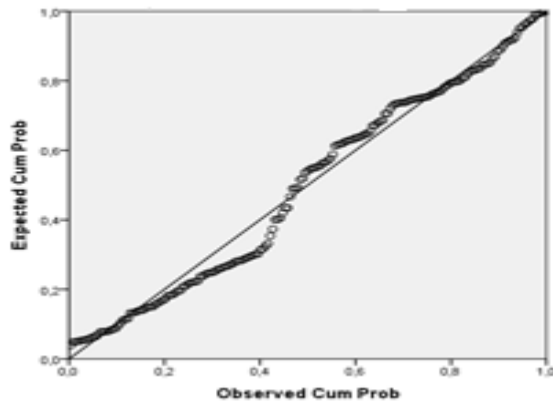


Figure 1 Normal P-P Plot of Regression Standardized Residual

Based on Figure 1, the residual values plotting along the linear line which indicates that the distribution of the residual fit the normal distribution.

RESULT AND DISCUSSION

After data about self-perception MHoM and implementation of online learning were collected, the ordinal data were converted into interval scale using method of successive interval. Then data analyzed descriptively using the interval scale and the result showed in Table 1.

Tabel 1
Descriptive Statistics

	N	SMI	x_{Min}	x_{Max}	\bar{x}	s
SP	191	81,48	41,84	64,99	50,09	4,35
IP	191	72,93	41,05	58,99	46,71	3,48

Annotation:

SP = variable of self-perception of MHoM
 IP = variable of implementation of online learning
 N = number of responds
 SMI = maximum ideal score
 x_{Min} = minimum score
 x_{Max} = maximum score
 \bar{x} = average score
 s = standard deviation

Based on Table 1, if the percentage of the average score for data of variables self-perception MHoM and implementation of online learning were counted, respectively gain 61,48% and 64,05% which is in high category based on Riduwan (2008). The percentage for the minimum score of both variables respectively are 51,35% and 56,29% which is in moderate category. It

portrays good quality of student's self-perception of MHoM and implementation of online learning. Analysis results that illustrate the relationship between both variables as shown in Table 2.

Table 2
Output of Determination Coefficient

R	R ²	F	df1	df2	Sig. F
0.197 ^a	0.039	7.621	1	189	0.006

Based on Table 2, the R² value = 0,039 which indicates only 3.9% of the variance of student's self-perception MHoM could be explained by the implementation of online learning. The Sig. F = 0.006 < α = 0.05 give strong conclusion that the r value is significant. The regression equation which describe the relationship between variable X and variable Y is presented in Table 3.

Table 3
Output Test of Simple Linear Regression

	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Beta		
(Constant)	38,572	4,182	9,224	0,000
1 MHoM	0,246	0,089	2,761	0,006

a. Dependent Variable: SP_MHOM

Based on Table 3, the model of the regression which point the relationship between X and Y is $Y = 0,246 X + 38,572$. The significance test for the model shown in Table 4.

Table 4
Output of Significant Test of Regression

	Sum of Squares	df	Mean Square	F	Sig.
Regression	139.473	1	139.473	7.621	0.006 ^b
Residual	3458.762	189	18.300		
Total	3598.235	190			

a. Dependent Variable: SP_MHOM

b. Predictors: (Constant), IPS_MHOM

Based on Table 4, the sig. value = 0.006 < α = 0.05 which means, in 5% level of significance regression model $Y = 0,246 X + 38,572$ is a significant simple linear regression equation.

The equation $Y = 0,246 X + 38,572$ illustrate the positive relationship of student's self-perception MHoM and implementation of online learning. This significance relationship tells that every one unit increase of the quality of implementation of online learning will affect the increase of 0,246 point of the student's self-perception of MHoM. Thus, mean that the implementation of online learning has a positive impact on student's perception of their MHoM which is still in low category of impact. It might be because of student's self-perception of MHoM already in high category so the students can quickly adapt to the situation of online learning and of course the interval of changes tend to be narrower if compared with the students in low category of MHoM.

This high category of self-perception of MHoM could represent strong disposition of intelligent behavior (Costa&Kallick, 2008). Student's with high quality of MHoM will able to encounter a variety of mathematical problems independently with full confidence that vary from simple to the very complex one. In another words, habit of thinking did not automatically develop through learning but must be designed specifically (Rustaman, 2008).

Irawan, Susanti, dan Triyanto (2015) reported that the use of internet in learning is still partial, wider the study gap and cause unequal distribution of the quality of learning between each student. For higher education, online learning mostly assumed as a repository of teaching materials for both teachers and students (Wicaksono, 2012). In fact, the concept of learning in higher education is more andragogy which means the online learning should be designed to be more participatory. Schmidt, Dickerson & Kisling emphasize that students in higher

education level, could be grouped as adult learner which likely to have extrinsic motivation to learn what they want to learn and they know better what they want to learn (Wicaksono, 2012).

CONCLUSION AND IMPLICATION

The implementation of online learning (X) gave a low impact on student's mathematical habits of mind (Y) which follow the equation $Y = 0,246 X + 38,572$. That means the impact which indicates that there are significant low impact of implementation of online learning on students self-perception mathematical habit of mind.

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