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# The Effect of Learning Independence and Motivation on Students' Learning Outcomes when Implementing Distance Learning

Agustina Setyaningsih<sup>1)\*</sup>, Gradina Nur Fauziah<sup>2)</sup>

<sup>1),2)</sup>Department of Sea Transport and Port Management, Politeknik Ilmu Pelayaran Makassar, Makassar, 90241, Indonesia

\*Corresponding author: [agustina.s@pipmakassar.ac.id](mailto:agustina.s@pipmakassar.ac.id)

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**Abstract** – The distance learning process at the Politeknik Ilmu Pelayaran Makassar requires cadets to learn more independently when compared to the face-to-face learning process. The purpose of this study was to determine the effect of learning independence and learning motivation on the learning outcomes of applied physics during the distance learning process. This study is ex-post facto research. The research was carried out at the Politeknik Ilmu Pelayaran Makassar in April – June 2021 with a research sample of 207 cadets. Data was collected using documentation and questionnaire methods and analyzed using regression and correlation analysis. The results showed that there was an influence of motivation on the learning outcomes of cadets in the implementation of distance learning at the Politeknik Ilmu Pelayaran Makassar with a correlation coefficient of 0.216. Likewise, the learning independence of cadets' learning outcomes in the implementation of distance learning at the Politeknik Ilmu Pelayaran Makassar with a correlation coefficient of 0.681. The conclusion obtained is learning independent and motivation have an effect on learning outcomes.

**Keywords:** cadets; learning independence; learning outcomes; motivation

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## I. INTRODUCTION

The Coronavirus Disease 19 (Covid-19) outbreak requires educational institutions to innovate in the learning process (Marini & Milawati, 2020). One form of this innovation is to conduct online learning in the form of distance learning (Napsawati, 2020). Distance

learning is an effort for educational problems with limitations between teachers (tutors) and students to meet face-to-face by holding learning that separates teaching staff from students with the help of print and electronic media. One of the higher education environments that implement distance learning is the Politeknik Ilmu Pelayaran

*Makassar* (Merchant Marine Polytechnic of Makassar). With the implementation of distance learning at the Merchant Marine Polytechnic of Makassar, it requires students or better known as cadets to have independence and high learning motivation so that they can adapt to distance learning situations, especially in physics subjects.

The Covid-19 pandemic has tremendously changed human lives in the world (Nurfadillah et al., 2022). However, the pandemic has also put the education system on pause to prevent the virus spread (Popescu et al., 2013). Therefore, the Ministry of Education and Culture of the Republic of Indonesia issued a regulation that the learning activity is conducted in distance learning (Churiyah et al., 2020). During distance learning, students did self-learning orientation, where the teacher delivered lessons not in the same room or without face to face (Parlina et al., 2021).

Motivation and learning outcome mutually influence each other (Mulyaningsih, 2014). Learning motivation is the overall psychic driving force contained in students that gives rise to learning activities, ensures the continuity of learning activities, and provides direction for these learning activities in order to achieve a goal (Herliana et al., 2015). Learning motivation plays a very important role in providing encouragement or enthusiasm for learning so that students who have high learning motivation will have a high learning spirit as well (Napsawati,

2019). Learning motivation is an internal process that encourages students to carry out academic activities or tasks to achieve learning goals and be able to survive within a certain time span (Sudibyoy et al., 2016; Bahri, 2020). Motivation can also be said as a driver of effort and achievement. In online learning, intrinsic motivation consists of self-motivation, self-discipline, self-adaptation, feeling indifferent, while extrinsic motivation consists of online learning, lecturers/teachers, use of online learning media, exams/tasks, family, friends, and environment. Intrinsic motivation is one of the determinants of success in learning, especially online learning (Nasrah & Muafiah, 2020; Angrasari, 2018).

Independent learning is very important and must be a concern for the parties involved in the world of education (Handayani & Hidayat, 2019). Learning independence is one of the important attitudes possessed by students (Aulia et al., 2019). Independent learning is needed in the educational process in order to achieve learning goals that emphasize an active person in developing his potential (Sugianto et al., 2020). In general, students can be said to be independent if they actively participate in their own learning process metacognitively, motivationally, and behaviorally (Julaecha & Baist, 2019).

Students who have independent learning tend to be easier in completing the tasks given by the teacher and have more confidence in their own abilities than the abilities of others

(Sanita et al., 2021). Independent learning has the following characteristics: 1) able to think critically, creatively, and innovatively; 2) not easily influenced by the opinions of others; 3) not avoiding problems; 4) solve problems with deep thinking; 5) able to solve problems independently without asking for help from others; 6) don't feel inferior if you have different opinions with other people; 7) able to work with perseverance and discipline; 8) able to take responsibility for themselves

Based on the description above, this study aims to describe the effect of independent learning and motivation on the learning outcomes of applied physics for cadets at the Merchant Marine Polytechnic of Makassar. So, the research questions are as follows:

- 1) Is there an influence between learning independence on learning outcomes of applied physics during the distance learning process?
- 2) Is there an influence between motivation on learning outcomes of learning applied physics during the distance learning process?

## II. METHODS

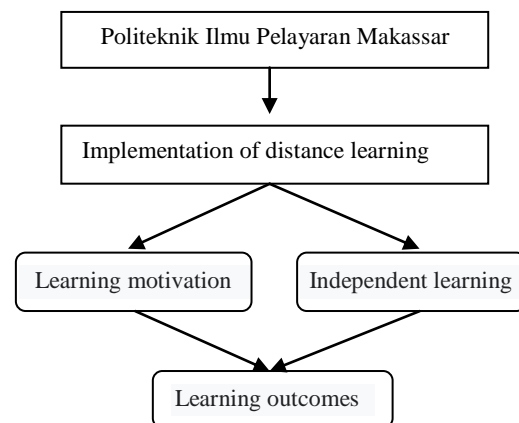
This study is ex-post facto research. The study was carried out at the Merchant Marine Polytechnic of Makassar from April to June 2021. The variables of this study consisted of independent variables (motivation and learning independence) and dependent variables (learning outcomes).

The population in this study were all young cadets in Semester III in the Nautika, Teknika, and KALK study programs, Merchant Marine Polytechnic of Makassar, amounting to 431 people. Based on this population, the size of the research sample is based on the equation below (Akdon & Riduwan, 2013).

$$n = \frac{N}{N.d^2+1} \quad (1)$$

By using this formula, the number of samples for a population of 431 with an accuracy level of 5% is 207 cadets.

The research process starts with distance learning at Makassar Marine Science Polytechnic. Treatment is provided through distance learning in the form of learning motivation and independent learning. Following the treatment, a physics learning outcome test was conducted as part of the end-of-semester exam. The research procedure is depicted in Figure 1 below.



**Figure 1.** Research procedure

Data was collected using the following instruments: (a) cadets' motivation questionnaire, (b) cadets' independence questionnaire, and (c) final semester exam results for young cadets from Nautika, Teknika, and KALK study programs in applied physics courses. In addition to questionnaires, data collection was also carried out using the documentation method. Furthermore, according to Sugiyono (2016), the data analysis technique uses regression analysis with the following equation:

$$Y' = a + bX \tag{2}$$

Furthermore, the multiple regression analysis was used to test the effect of the two independent variables together on the dependent variable. The multiple regression analysis formula is:

$$Y' = a + b_1X_1 + b_2X_2 \tag{3}$$

To find out how strong the influence between the independent variables on the dependent variable is, the correlation formula is used as follows: (Sugiyono, 2016)

$$r_{xy} = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}} \tag{4}$$

$$R_{yx_1 \cdot x_2} = \frac{ryx_1 - ryx_2 \cdot rx_1x_2}{\sqrt{1 - r^2x_1x_2} \sqrt{1 - r^2yx_2}} \tag{5}$$

### III. RESULTS AND DISCUSSION

#### A. Results

*The effect of learning motivation on learning outcomes*

An overview of the effect of learning motivation on learning outcomes in the implementation of distance learning is presented in Table 1 below

**Table 1.** Results of regression analysis of learning motivation on physics learning outcomes

Coefficients <sup>a</sup>					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	4.484	.316	14.169	.000
	x1	.016	.035	.216	3.160 .002

a. Dependent Variable: y

Table 1 shows that  $t_{count}$  is greater than  $t_{table}$  ( $3.160 > 1.652$ ) or a significance value ( $0.000 < 0.05$ ). Next, the test was continued with simple correlation analysis to determine the influence of learning motivation on

cadets' learning outcomes. The description of the results of the correlation analysis between learning motivation and cadets' learning outcomes is as follows:

**Table 2.** Results of correlation analysis of learning motivation on physics learning outcomes

Correlations			
		x1	y
x1	Pearson Correlation	1	.216**
	Sig. (2-tailed)		.002
	N	207	207
y	Pearson Correlation	.216**	1
	Sig. (2-tailed)	.002	
	N	207	207

\*\*., Correlation is significant at the 0.01 level (2-tailed).

The results of the correlation analysis in table 2 show that there is an influence of learning motivation on the physics learning outcomes of cadets. The correlation is in the low category with a correlation coefficient of 0.216.

*The influence of independent learning of cadets on physics learning outcomes*

An overview of the influence of cadets' independent learning on physics learning outcomes in the implementation of distance learning. The simple regression analysis is described in the following table:

**Table 3.** Results of the regression analysis of learning independence on physics learning outcomes

Coefficients <sup>a</sup>					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	3,340	3,730		7,877	,000
X2	,002	,026	,681	4,326	,000

a. Dependent Variable: y

Table 3 shows that  $t_{count}$  is greater than  $t_{table}$  ( $4326 > 1.652$ ), or the significance value ( $0.000 < 0.05$ ). Next, the test was continued with a simple correlation analysis to determine the effect of independent learning

on the physics learning outcomes of cadets. The description of the results of the correlation analysis between independent learning and physics learning outcomes for cadets is as follows:

**Table 4.** Results of correlation analysis of learning independence on students' physics learning outcomes

<b>Correlations</b>			
Correlation of learning independence		Learning outcomes	Cadets
Learning motivation	Pearson Correlation	1	,681**
	Sig. (2-tailed)		,000
	N	207	207
Learning independence	Pearson Correlation	,681**	1
	Sig. (2-tailed)	,000	
	N	207	207

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## B. Discussion

The results obtained indicate that there is an effect of providing motivation on physics learning outcomes during distance learning. The results of the regression analysis obtained values of a and b, where  $a = 4.484$  and  $b = 0.016$ . Therefore, the regression equation for the effect of learning motivation on physics learning outcomes is  $y' = 4.484 + 0.016X_1$ . If the optimal score is  $X = 100$ , then the Y value is 1.554. This value means that if learning motivation is increased to the optimal score (100), then the learning outcome score will increase by 1.554 (from the optimal score of 4.00). This illustrates that the higher the motivation to learn, the higher the physics learning outcomes of cadets. The results of further analysis based on correlation analysis obtained an r-value of 0.216. This shows that the level of influence of learning motivation on physics learning outcomes in distance learning is in a low category.

Research on the influence of motivation and learning outcomes has previously been

carried out by [Setiawan et al. \(2016\)](#). The results showed that there is a positive influence of learning motivation on physics learning outcomes. The learning outcomes themselves are the values obtained by cadets after participating in the learning process. The research results obtained are also in line with the results of research conducted by [Imron and Sahyar \(2019\)](#), which shows that there is a positive partial effect of learning motivation on physics learning outcomes with a coefficient of determination ( $R^2$ ) of 0.438 (43.8%).

However, the results obtained by [Meliza et al. \(2021\)](#) differ from ours in that there is no relationship between motivation and physics learning outcomes. The results of their research revealed that students had not mastered the magnetic field material, so learning outcomes were not coherent with learning motivation.

Furthermore, based on the results of the regression analysis, the values of a and b are obtained, where  $a = 19.340$  and  $b = 0.641$ , so

that the regression equation for the influence of independent learning on the physics learning outcomes of cadets is  $y' = 3.582 + 0.002X_2$ , meaning that if learning independence is increased to the optimal score (75), then the score of physics learning outcomes will increase by 3.732 (from the optimal score of 4.00). This illustrates that the higher the learning independence, the higher the physics learning outcomes of cadets. The results of the correlation analysis obtained an r-value of 0.681. This indicates that the level of influence of learning independence on physics learning outcomes during distance learning is in the high category.

Based on the above, it shows that the independence of cadets in learning during the implementation of Distance Learning is very important in improving physics learning outcomes. The independence referred to in this case is the cadets' independence from only the material presented by the lecturer but must be more clever in utilizing other sources of information.

The results of the research above are in line with the results of research conducted by Rini et al. (2020), which shows that the attitude of independence in learning physics has a correlation and affects learning outcomes, especially in the cognitive aspect. The results of the tests that have been carried out, the results of the Pearson correlation are 0.936.

Another study that is in line with this research is the research conducted by Bungsu

et al. (2019). The results of their research indicate that there is an effect of independent learning on student learning outcomes. The contribution of independent learning to learning outcomes is 15%. In addition, another research is research that has been conducted by Prayuda et al. (2014), which shows that learning independence has an effect on student learning outcomes.

#### IV. CONCLUSION AND SUGGESTION

Based on the research results obtained, the conclusion in this study is that there is an influence of motivation on physics learning outcomes for cadets during the implementation of distance learning at the Merchant Marine Polytechnic of Makassar with a correlation coefficient of 0.216. Likewise, there is the effect of independent learning on physics learning outcomes for cadets in the implementation of distance learning at the Merchant Marine Polytechnic of Makassar with a correlation coefficient of 0.681.

Based on the results of this study, it is suggested to the lecturers to create a pleasant learning atmosphere so that the students' learning motivation can increase. In addition, to researchers who are interested in conducting research related to learning outcomes during the implementation of distance learning in order to examine other variables that affect learning outcomes.

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