The Effect of Self-regulation and Motivation to Outcomes Learning Using Blended Learning Approach

Susanna[1], F Herliana[1], Elisa[1], A Farhan[1], S Rizal[2], Musdar[2]

[1]Physics Education Department, Faculty of Teacher Training and Education – UniversitasSyiah Kuala, Indonesia
[2] Physics Education Department, Faculty of Teacher Training and Education – UniversitasSerambiMekkah, Indonesia

Abstract: This research aims to determined the effect of self-regulation and motivation to learning outcomes in basic physics courses after using the blended learning approach. This research is a quantitative study with a sample size of 67 people. Samples were taken using random sampling technique from all 1st semester students taking basic physics courses. Data collection was used a self-regulation questionnaire, a learning motivation questionnaire, and student learning outcomes obtained from the accumulation of cognitive, affective, and psychomotor score during the lecture process using a blended learning approach. Data were analyzed using multiple linear regression which was previously tested for linearity and homogeneity. The results of the analysis show that the value of $R^2 = 0.749$ and the equation $Y = 0.113X_1 + 0.134X_2 + 49.37$. Based on these results it can be concluded that there is a positive influence between self-regulation and motivation on student learning outcomes in basic physics courses using a blended learning approach. This approach can continue to be developed for students are more motivated and independent in learning so that student learning outcomes can continue to increase even though they cannot learn in real classes during covid-19 pandemic era.

Keywords: Self-regulation, Motivation, Outcomes Learning, Blended Learning

1. Introduction

In the past two years, the coronavirus disease (covid-19) has spread throughout the world so rapidly that it has changed the pattern of human life in a short time. Changes occur in various aspects, including aspects of education where the teaching and learning process cannot be done in the classroom as usual. The government issued a ban on carrying out learning activities in schools to reduce the risk of transmission of this virus (Onyema, E. M., et.al., 2020). Teaching and learning activities are transferred online using various digital learning media. This change requires people around the world to adapt quickly to be able to survive, including people in Indonesia (Giatman, M, et.al., 2020). In the aspect of education, students and teachers are required to quickly adapt to a changing learning environment. If it does not adapt quickly, the learning process will be hampered and Indonesian education will be left behind compared to other countries. It is necessary to apply a learning approach that is suitable for current conditions, namely blended learning (Herliana, F., et. Al., 2020).

Blended learning is a learning approach that combines face-to-face learning with digital media-assisted independent learning (Graham, C., et.al., 2006). Thanks to the rapid development of the times, currently there are many video conferencing platforms available that can be used for face-to-face online learning (synchrounous learning). In addition, many learning management systems (LMS) similar learning platforms have been developed to facilitate student independent learning, such as google classroom, Microsoft Teams, etc. (Supriyanto, A., et.al., 2020). The existence of this learning platform allows students to study independently at home with the help of digital media prepared by the teacher using this existing learning platform (asynchronous learning). By combining synchronous and asynchronous learning (blended learning), the learning process and evaluation will continue to run intact like conventional learning in the classroom (Halim et al, 2108a; Resta et al, 2020). However, the only difference is that the learning process takes place, which in the Covid-19 era, all learning was used an online system (distance learning) (Irwandi et al, 2018; Yulia, H., 2020).

2.Significance Of The Study

The interaction in distance learning is not the same as conventional learning where teachers and students only meet behind each other's laptop / handphone screens. The teacher's supervision of students also cannot be maximized because the teacher can only see students from behind the laptop screen. If students have a problem in learning, the teacher cannot help directly, can only help verbally through conversations on video conferences or chat forums. The interaction between of both does not occur directly, but depends on the strength of the internet network that connects the interactions of them. These things are evidence of inefficiency in learning and make it difficult to maintain academic integrity (Mukhtar, K., et.al., 2020). Effort in learning is equally required in these two different learning environments. In conventional learning, students and teachers try to get to school by public or private transportation to carry out the learning process. Whereas in distance learning, students and teachers try to prepare good learning tools so that they are not constrained by the internet network while the learning process is

in progress. The difference in efforts that must be made to achieve these learning objectives can depend on students' motivation and self regulation in learning (Sabah, N. M., 2020).

3.Review Of Related Studies

Students who have high motivation in conventional learning, do not necessarily have the same motivation for distance learning. This is shown by the results of research which found 71.4% of students disagreed with the statement that online learning was more motivating than conventional learning (Adnan, M., & Anwar, K., 2020). Likewise with self regulation where students who have characteristics such as responsibility for their studies, are able to make decisions in learning, have effort in learning, and believe in their abilities (Herliana, F., et al., 2021). Changes in the learning system from conventional to online learning can also change the self regulation of students in learning to be more high or low. This is the basis for the need to know the effect of motivation and self regulation on students' learning outcomes after using the Blended Learning approach.

4.Objectives Of The Study

- To find out the effect of motivation learning and self-regulation to outcomes learning using blended learning approach in basic physics course

5.Hypotheses Of The Study

- Motivation and self-regulation have a positive effect on student learning outcomes after using the blended learning approach in learning basic physicscourse.

6.Population And Sample

This research is a quantitative study with a sample size of 67 people. Samples were taken using random sampling techniques from all 1st-semester students taking basic physics courses in Physics Education Department, Faculty of Teacher Training and Education – UniversitasSyiah Kuala.

6.1.Statistical Techniques Used in the Present Study

The data were collected using a self-regulation questionnaire, a learning motivation questionnaire, and student learning outcomes. The 24-point self-regulation questionnaire used in this study refers to 6 indicators, namely: Goal Setting, Environment Structuring, Task Strategies, Time Management, Help Seeking, and Self Evaluation (Barnard, L., et al., 2009). In addition, this study also used a learning motivation questionnaire, amounting to 32 points referring to 3 indicators, namely: choice of tasks in learning, effort in learning, and persistence in facing difficulties (Herliana, F., et al., 2015). Both questionnaires were given after participating in a basic physics course using the blended learning approach and obtained data on self-regulation and student motivation after learning using the blended learning approach. In addition to questionnaires, other data collected were student learning outcomes obtained from the accumulated cognitive, affective, and psychomotor values during the lecture process using a blended learning approach. The collected data were analyzed using multiple linear regression which was previously tested for linearity and homogeneity. After being analyzed, it is obtained a linear equation that shows the effect of self-regulation and student motivation on learning outcomes after learning using a blended learning approach.This technique has also been used by several previous researchers (Halim et al, 2018b; Wati et al, 2020).

6.2.Data Analysis and Interpretation

This study aims to determine the effect of self-regulation and learning motivation on student learning outcomes after learning using a blended learning approach. In previous research, self-regulation has a positive effect on learning outcomes in direct learning in the classroom (McCaslin, M., et.al., 2013) because the classroom learning environment is a good predictor of student self-regulation in learning (Yerdelen, S., &Sungur , S., 2019). Learning motivation also greatly affects student learning outcomes in classroom learning (Herliana, F., et al., 2015). However, in blended learning that combines direct (synchronous) and indirect (asynchronous) online learning, it is not yet known whether student self-regulation and student learning motivation have an effect on learning outcomes.

Before analyzing the data from the research results, the assumption test was carried out first in this study, namely the normality and homogeneity test. In the normality test, the results of research data are normally distributed as shown in the figure below:

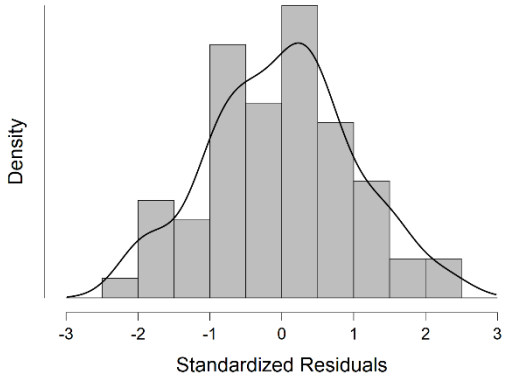

Figure 1. Normally distributed data diagram

In addition, the data is also homogeneous, after testing the homogeneity as shown in the figure:

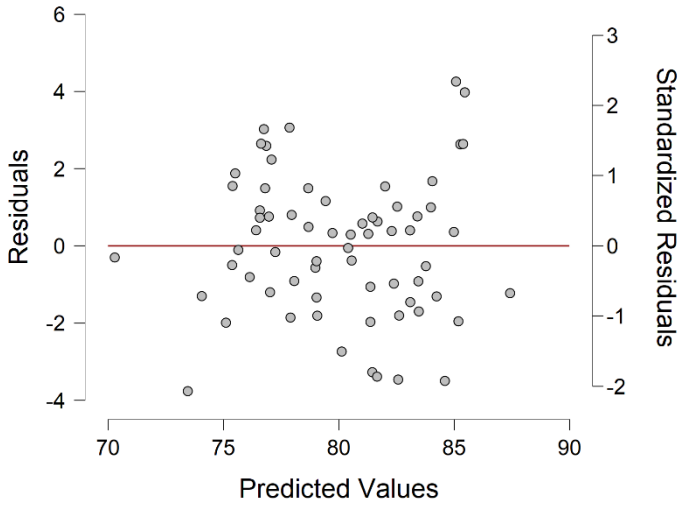

Figure 2. Homogeneous data diagram

After being tested for normality and homogeneity, the next assumption test is carried out, namely the linearity test. In the linearity test, data on self-regulation on learning outcomes were tested linearly and data on learning motivation on learning outcomes were also tested linear as shown in the following figure:

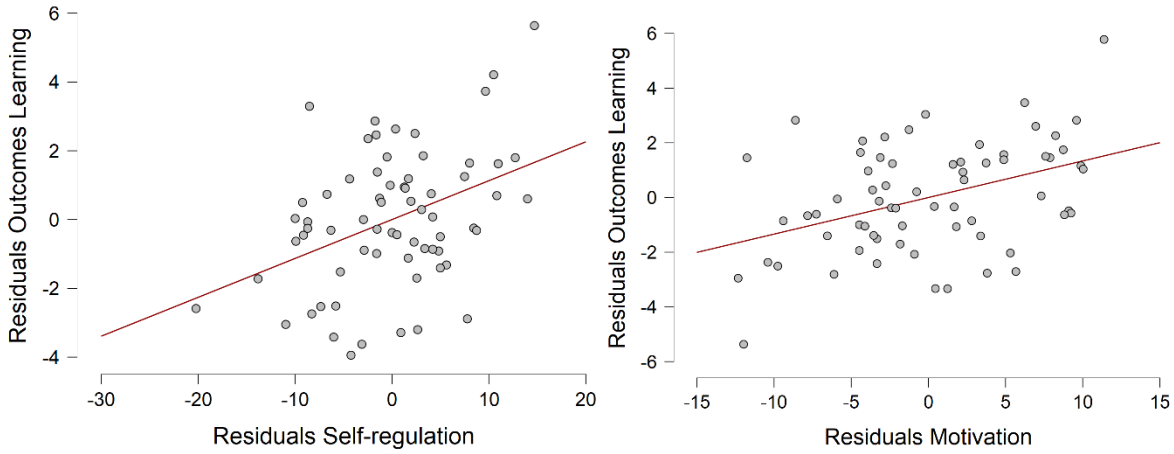

Figure 3. Linierity data diagram

The results of the analysis test using multiple linear tests obtained the value of $R^2 = 0.749$. This shows that the contribution / effective contribution of the variable self-regulation and motivation to learning outcomes is 74.9%, while 25.1% is influenced by other factors that are not explained in this study. The results of this hypothesis test are shown in detail in the following table:

Table 1. The results of the analysis test using multiple linear tests

Model	R	R^2	Adjusted R^2	RMSE
H_0	0.000	0.000	0.000	4.006
H_1	0.891	0.794	0.788	1.847

To determine the significance of the effective contribution of the variables of self-regulation and motivation to learning outcomes, tested using ANOVA and obtained the value of Fcount>Ftable so that it is significant as can be seen in the following table:

Table 2. the significance of the effective contribution of the variables of self-regulation and motivation to learning outcomes

Model		Sum of Squares	f	Mean Square	F	p
H_1	Regression	841.075		420.537	123.311	< .001
	Residual	218.263	4	3.410		
	Total	1059.338	6			

Based on the data above, it can be concluded that the variables of self-regulation and student learning motivation together are able to predict the learning outcomes of students who learn using the blended learning approach. This shows not only in conventional classes where learning is carried out directly in the classroom, the variables of self-regulation and learning motivation can predict learning outcomes but the same thing also happens to learn that used a blended learning approach.

The difference between conventional learning in the classroom and blended learning lies in its implementation. In blended learning, the face-to-face learning process is combined with the online learning process using a Learning Management System (LMS) so that student self-regulation greatly affects the success of the learning process using this approach (Song, D., & Kim, D., 2020). If the student's self-regulation is low, the online learning process using LMS will not run according to the expected goals (Lynch, R., &Dembo, M., 2004) because students do not have the ability to manage their own learning.

When viewed from each variable, the equation $Y = 0.113X_1 + 0.134X_2 + 49.37$ is obtained as described in the table below:

Table 3. Table of predict variable self-regulation and motivation learning to outcomes learning

Model		Unstandardized	Standard Error	Standardized	t	P	Collinearity Statistics	
							Tolerance	VIF
H0	Intercept	80.056	0.489		163.564	< .001		
H1	Intercept	49.373	2.096		23.553	< .001		
	Self-regulation	0.113	0.032	0.449	3.499	< .001	0.195	5.119
	Motivation	0.134	0.037	0.466	3.628	< .001	0.195	5.119

The data above shows that the self-regulation variable can significantly predict student learning outcomes. Likewise, the learning motivation variable can significantly predict student learning outcomes. Where the self-regulation variable can predict learning outcomes of 0.113*self-regulation and learning motivation variables can predict learning outcomes of 0.134*learning motivation. The higher the student's self-regulation, the higher the learning outcomes. The same thing applies to motivation in students. The higher the student's learning motivation, the higher the learning result. This is because students realize the level of responsibility for their own development. They are more confident in their own abilities which contribute to internal motivation. Therefore, they can carry out activities and get maximum results. Academic achievement increases if a person is aware of

his goals, controls, regulates, and directs his impulses, follows rules, prefers careful planning, and shows persistence in achieving success (Daniela, P., 2015). In the Blended Learning approach, students learn to use 2 systems, namely at the same time (synchronous) and at different times (asynchronous). In this study, asynchronous learning was used e-learning where students can access it anytime and anywhere. Therefore, the ability to manage their own learning is very much needed in asynchronous learning (Kim, D., et.al., 2018) because in this learning students are free to manage study time and things they want to learn themselves (Pardo, A., et.al. ., 2016) although assisted by e-learning. The ability to manage their own learning using e-learning demands student learning independence (Liaw, S., & Huang, H. M., 2013) where students access e-learning to learn on the basis of their desire to achieve learning goals. In addition, students arrange for themselves an effective time and place to learn using e-learning, as well as ask for help from teachers or other friends through discussion forums if they find difficulties in learning. The aspect of grit, perseverance of effort, self-efficacy, motivation, time, and study environment management strategies are important components needed in independent learning (Wolters, CA, & Hussain, M., 2015) so that blended learning affects student self-regulation. If students have low self-regulation, this learning will not run effectively and will affect their learning outcomes (Zimmerman, B. J., & Schunk, D. H., 2012) as in the following picture:

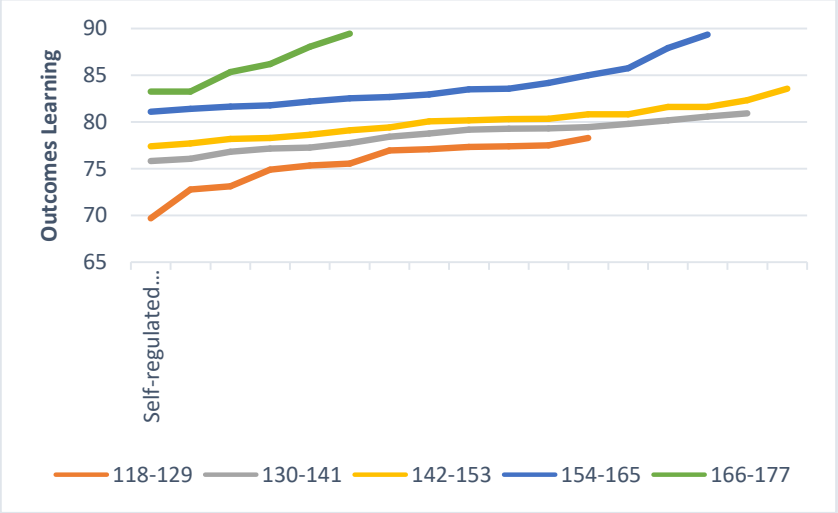

Figure 4. Self-regulated Learning to Outcomes Learning after using Blended Learning Approach

In addition to asynchronous learning, in the Blended Learning approach, there is also synchronous learning. This study is virtual face-to-face learning using zoom meetings. Students learn face-to-face with their teachers and friends like in class, the difference is that they need an internet network to be able to join virtual classrooms (Bower, M., et.al., 2015). The learning atmosphere is of course very different from direct learning in the classroom because, in fact, they are alone in a home / other place connected to an internet network to attend online classes (Cavus, N., et. Al., 2021). This can affect students' external motivation, because the surrounding environment can affect student learning motivation, including this online learning environment (García-Alberti, M., et.al., 2021). Motivation can decrease or increase with the implementation of this virtual synchronous learning. From the research results, it can be seen that there are students who are enthusiastic when learning to use zoom meetings, there are also those who do not focus and even do other things during the learning process. This is due to the limited supervision of teachers in virtual learning activities.

Students who have high learning motivation appear enthusiastic in participating during learning activities with a blended learning approach. This is because, before virtual face-to-face learning activities, students are provided with materials, videos, and other teaching materials that they can learn at any time through a learning management system (LMS). Students with high motivation will be more excited if given stimuli that help them in learning (Lin, C. H., et. Al., 2017). Therefore, students who have high motivation tend to be able to learn independently because they have persistence in learning to achieve a goal (Santrock, J. W., 2009). During virtual synchronous learning, students with high motivation will be more enthusiastic about learning because they have studied the material provided by the teacher through the LMS. So that they have more questions because of their high curiosity than students who are low motivated. Conversely, students with low motivation tend to ignore the teaching materials provided by the teacher through the LMS because of their low curiosity. In general, they attend face-to-face learning only to fulfill their obligation to attend the virtual classroom, not to actually study. They are not even ready for distance learning tools, such as sufficient internet quota and stable internet networks. Most of them often go in and out of virtual classrooms with the excuse of an unstable internet network. This shows the students' unpreparedness in learning because their motivation in learning is very low. High motivation and independent learning that students have, make students play a more active role in virtual synchronous

learning so that students can master the material they are learning by themselves asynchronously and are supported by direct teacher explanations through synchronous learning (blended learning). Students get complete knowledge, not only from the teacher's explanation in the classroom but also from sharing sources that they can access via the internet (Herliana, F., et. Al., 2020) as shown in the following figure:

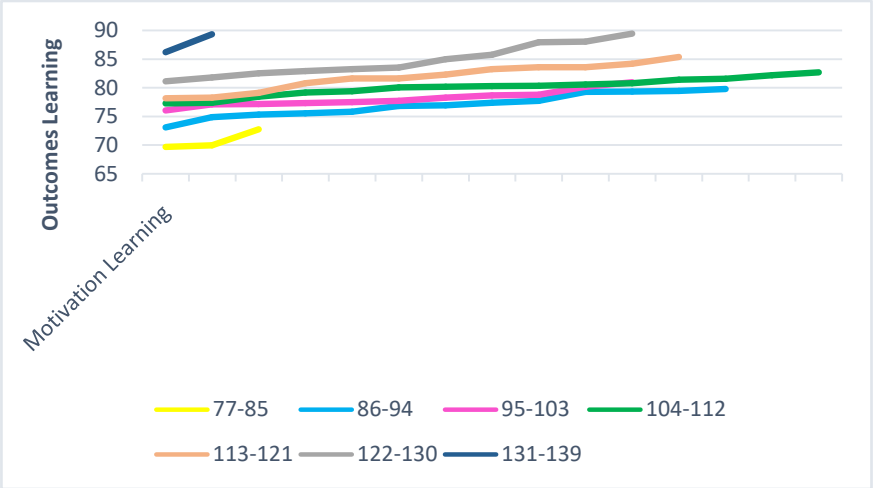

Figure 5. Motivation Learning to Outcomes Learning after using Blended Learning Approach

Based on the data above, it was found that learning motivation and independence were needed in the blended learning approach because these two variables had a positive effect on student learning outcomes.

7.Recommendations

- The blended learning approach can be applied in online learning during the Covid-19 pandemic
- Motivation and learning independence are the main concerns in the application of the blended learning approach so that learning runs effectively and efficiently
- The blended learning approach can be developed to be more attractive in order to increase student motivation and learning independence
- Efforts to develop blended learning-based learning tools need to be made so that the application of blended learning runs more effectively.

8.Conclusion

Motivation and self-regulation have a positive effect on student learning outcomes after using the blended learning approach in learning basic physics. This shows that by using the blended learning approach, motivation and independent learning still have a positive effect on student learning outcomes so that this approach can continue to be used and developed during the Covid-19 pandemic, not only in basic physics courses but also in all the subjects in Department of Physics Education, Faculty of Teacher Training and Education - UniversitasSyiah Kuala in order to maintain the quality of our education. The development of the teaching and learning process using the blended learning approach is very necessary to increase student motivation and self-regulation so that it can have a direct effect on learning outcomes

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