The Influence of the Edmodo-Based Blended Learning Model on Student Learning Outcomes in Fluid Materials in High School

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ABSTRACT

This study aims to determine the effect of the Edmodo-based blended learning model on student learning outcomes in static fluid material at Smart Pure Tembung High School. that meet the criteria for a good test instrument include the normality test, homogeneity test, and hypothesis testing using SPSS. This type of research is a quasi-experimental with a two-class design, namely the experimental class and the control class with a population of 64 students. Based on data analysis from the experimental class, the initial ability was not good, namely 63.13. The results of static fluid learning after using blended learning with Edmodo were 83.28 in the good group. The study findings ranged from 56.87 to 63.28 in the control class. According to these statistics, blended learning using Edmodo can amazingly improve academic achievement and outperform conventional learning outcomes. The average level of student learning activity in the experimental class was 50% with the active category at the first meeting, increased to 69% with the very active category at the second meeting, and increased to 75% with the very active category at the third meeting. Therefore, the application of Edmodo-based blended learning can increase student activity during the learning process.

INTRODUCTION

The COVID-19 (Corona Virus diseases-19) pandemic has had a major impact on the world community, especially in the economic sector and also the education sector. The rapid spread of this new type of virus for which there is no cure has resulted in an influx of patients and overwhelmed medical personnel. As a result, quite a few lives were lost. To prevent infection, many countries in the world, including Indonesia, are implementing social distancing, namely maintaining distance, avoiding crowds, and reducing unnecessary activities outside the home. In the education sector, learning activities have shifted from studying at school to studying at or from home, which is then known as online learning.

The concept of online learning has actually been known for a long time, initially introduced by open campuses implementing distance learning. As technology develops, distance learning is starting to use the internet as a link between teachers and students, which is then called online learning. (Ahmad, 2018). The use of the internet as a medium for instructional learning has become a sign of the entry into the era of the industrial revolution 4.0. In this era, internet networks, computers or smartphones have become important tools in the teaching and learning process. The learning process which previously had to be done face to face between teachers and students, now in the era of industrial revolution 4.0 learning can be done with online classes via special online learning media platforms such as Google Classroom,

Zoom, Edmodo and so on or even simply. using social media platforms such as WhatsApp, Facebook, or other media platforms that support the online learning process (Risdianto, 2019). However, the problem experienced by teachers is the ability to use technology in the learning process online, because not all teachers master various learning platforms as media that support the online learning process, so this becomes a problem for teachers in implementing the online learning process (Pohan, 2020).

Edmodo is a school environment-based social network developed by Nicolas Borg and Jeff O'Hara with features that support the teaching and learning process. Edmodo allows educators to provide teaching materials for students when educators are unable to attend face-to-face learning. Through the Edmodo application, educators can give assignments to students online and the learning objectives will be achieved according to the learning targets. Edmodo is also a learning tool that can be an online platform to encourage educators' learning or can be a more effective way to involve students in learning. Apart from providing material, Edmodo can be used to provide assignments, quizzes and assessments to students. Apart from that, Edmodo also has advantages, namely a user interface or adapting a display like Facebook. In simple terms, Edmodo is relatively easy to use even for beginners, compatibility or Edmodo supports previews of various types of file formats such as PDF, PPTX, HTML, SWF, and so on. The downside is that Edmodo is not integrated with social media any media such as Facebook, Twitter or Google Plus, Edmodo uses English programming language so that sometimes it makes things difficult for teachers and students. However, this weakness does not become a barrier to using Edmodo media because users need awareness to be actively involved in learning and the language of the program can make users learn English little by little, as we already know that English is an international language. With Edmodo, it is hoped that we will be able to continue to monitor the progress of students' learning outcomes so that they can develop and improve. Edmodo also has group codes that allow educators to place learning materials, assign assignments, and conduct exams.

Physics is one of the subjects taught in school. One of the goals of studying physics is to develop critical thinking abilities, scientific skills, and conceptual knowledge. In learning physics, students need to find relationships between equations and concepts in everyday life (Rohmah, 2017). Based on a preliminary study at Smart Murni Tembung High School in 2022, from interviews with physics teachers, it was stated that in physics material more than 50% of students obtained test scores less than the Minimum Completeness Criteria (KKM). The low scores of students indicate that physics learning in schools is currently felt to be ineffective.

The low student learning outcomes, especially in physics lessons, are caused by several factors, namely: (1) the teacher's approach to learning is always oriented towards solving problems; (2) the learning model applied is lecture in nature; and (3) teachers compete to meet curriculum targets (Wardhani, 2007:2). The conventional learning model used by teachers is very focused on imparting knowledge and places more emphasis on practicing mathematical questions. This kind of learning encourages students to learn by rote (learning by rote) which does not facilitate deep understanding of learning.

Based on the problems described above, a solution is needed to cover the weaknesses of conventional methods. The Blenden Learning model is the right alternative to use in the learning process. The blended learning model is a combination of conventional (face-to-face) learning models with e-learning based learning models using electronic media.

Based on the description above, researchers are interested in conducting research by implementing an Edmodo-based blended learning model as a complement to face-to-face learning to solve the problem of low student learning outcomes in physics subjects, especially static fluid material, as well as looking at the needs of the participants. students with the use of technology in learning at school has not been realized.

METHODS

The research method focuses on Edmodo-based blended learning methods with types of research including experimental research, namely research that aims to determine whether there are differences due to the influence of something imposed on the subject, namely students. The influence in question is the student's learning outcomes after being given the specified model. The experimental class was given a blended learning model based on Edmodo, while the control class was given conventional learning model treatment. Before being given treatment, the two sample classes underwent a pretest to determine the students' initial abilities in the material to be taught. At the end of the learning activity, a posttest was carried out to see the students' final abilities after being given treatment.

The test used to obtain data on student learning outcomes before and after learning the Edmodo-based blended learning model is a multiple choice test with 20 questions. Before the test is used, content validity is first carried out by the validator.

This type of research includes quasi-experimental research, namely research that aims to determine whether there are differences due to the influence of something imposed on the subject, namely students. The intended influence is the student's learning outcomes after being given the specified model. The experimental class was given a blended learning model based on Edmodo, while the control class was given conventional learning model treatment.

Two-party hypothesis testing is used to determine the similarity of students' initial abilities in the two sample groups and one-party hypothesis testing is used to determine the application of a treatment, namely the Edmodo-based blended learning model, to improving student learning outcomes.

Then, to measure students' learning activities during learning, an assessment of learning activities was carried out in the experimental class and control class. In the experimental class, student learning activity data was obtained from affective assessments and psychomotor assessments, while in the experimental class, student activity data was obtained from student activities in class. Student learning activity data with affective assessments and psychomotor assessments are observed by observers during learning and analyzed using scores.

RESULTS AND DISCUSSION

Results

Description of Research Results
This research was carried out using two classes, namely class XI IPA 1 as the control class and XI IPA 2 as the experimental class. As a control class, the lecture method was treated with a sample size of 32 students, while the experimental class was a class treated with the Blended Learning method with a sample size of 32 students. To test students' initial abilities, a pretest or initial test was carried out with an average pretest score for the control class of 56.87 and for the experimental class of 63.13. Then after the learning was completed, a post-test was carried out to determine whether there was an influence of the model applied and the average post-test score for the control class was 63.28 and for the experimental class it was 83.28.

Kelas Eksperimen				Kelas Kontrol			
Nilai	Frekuensi	Rata- Rata	Standar Deviasi	Nilai	Frekuensi	Rata-Rata	Standar Deviasi
30-39	1			20-29	2		
40-49	4	63,13	14,960	30-39	1	56,87	13,305
50-59	6			40-49	2		

60-69	9		50-59	9
70-79	4		60-69	14
80-89	8		70-79	4

Table 1. Pretest Data for Experimental Class and Control Class

The two classes were then given different model treatments, then both classes were given a posttest with the same questions as the pretest questions to determine whether there was an influence from the model applied. The posttest results for the experimental class and control class are shown in Table 2.

Kelas Eksperimen				Kelas Kontrol			
Nilai	Frekuensi	Rata-Rata	Standar Deviasi	Nilai	Frekuensi	Rata-Rata	Standar Deviasi
30-41	1			35-42	3		
42-53	1			43-50	4		
54-65	5	83,28	25,353	51-58	4	63,28	12,353
66-77	2			59-66	7		
78-89	4			67-74	9		
90-100	19			75-81	7		

Table 2. Posttest data for experimental class and control class

From table 2, it can be concluded that in the experimental class, the scores achieved by students improved more than in the control class. This shows that there is an influence of Edmodo-based blended learning on students' physics learning outcomes. After the pretest and posttest are carried out in the two classes, the results of the pretest and posttest will be tested for similarity using the data assumption test, namely the pretest and posttest average similarity test which consists of a normality test and a homogeneity test.

Pretest and Posttest Data Analysis

a) Normality test

Before testing the hypothesis, a data prerequisite test is first carried out, namely the normality test using the Liliefors test. The normality test results obtained can be shown in Table 3.

No	Data	Lhitung	Ltabel	Kesimpulan
1	Pretes kelas Eksperimen	0,115	0,886	Normal
2	Pretes kelas kontrol	0,142	0,886	Normal
3	Postes kelas eksperimen	0,141	0,886	Normal
4	Postes kelas kontrol	0,084	0,886	Normal

Table 3. Normality test of data for both samples

Table 3 shows that L_{count} < L_{table} with α = 0.05. Based on the results of the L_{count} and L_{table} calculations, it can be concluded that the data for the two sample classes is normally distributed.

b) Homogeneity Test

Homogeneity testing is carried out to determine whether the sample class comes from a homogeneous population or not, meaning whether the sample used in this research can represent the entire population. Test the homogeneity of the pretest for the experimental class and

the control class using the equality of two variances test. Data homogeneity testing was carried out using the F test. The homogeneity test results can be seen from the following table:

No	Data	Varians	Fhitung	Ftabel	Kesimpulan
1	Pretes kelas eksperimen	223,790	1,26	1,834	Homogen
2	Pretes kelas kontrol	177,016			
3	Postes kelas eksperimen	279,410	1,831	1,834	Homogen
4	Postes kelas kontrol	152,595			

Table 4. Results of Homogeneity Test Analysis

Table 4 shows the value of F_{count} < F_{table} (1.26 < 1.834) for pretest and (1.831< 1.834) for the posttest, which means that the sample used in this study is declared homogeneous or can represent the entire population.

c) *Hypothesis Testing*

Hypothesis testing is carried out to find out whether the independent variable (X) has an effect on the dependent variable (Y), where the independent variable in this research is the effect of the learning model, namely Make a Match, on student learning outcomes. To find out the hypothesis test using the N-Gain Independent T-Test with a significance level of 0.05, if the Sig (2-tailed) value is <0.05 then the hypothesis is accepted and if Sig. (2-tailed) > 0.05 then the hypothesis is rejected.

Uji	Analisis	Sig. (2-Tailed)
Hipotesis	N-gain Independet t-test	0,00

Table 5. Hypothesis testing

Based on table 5 data, the results of hypothesis testing using the N-Gain Independent Sample T-test on student learning outcomes obtained a significance value of 0.000<0.05, therefore it can be concluded that there is a significant influence between the use of the Blended Learning learning model and the lecture method to improve student learning outcomes, it can be said that the hypothesis is accepted, namely that there is an influence of the application of the Blended Learning learning model on student learning outcomes in Fluid material in high school.

d) *Observation*

Observations are used to show assessments of student activities and student attitudes during the learning process in the experimental class. Observations were carried out during teaching and learning activities which consisted of three meetings with the observer. Student activities assessed consist of 7 aspects of observation which are carried out based on the instructions on the observation instrument at each meeting. The results of observations can be seen from field notes made during the learning process. Data from observations of student activities can be seen in the following table:

Meeting I N=32	Visual	Oral	Listening	Motor	Writing	Mental	Emotional
Amount	72	71	81	78	76	77	73
Mark	56,25	55,47	63,28	60,94	59,38	60,16	57,03
Average				59%			
Category				Less Active			

Meeting II							
N=32	Visual	Oral	Listening	Motor	Writing	Mental	Emotional
Amount	84	86	91	95	93	89	79
Mark	65,63	67,19	71,09	74,22	72,66	69,53	61,72
Average				69%			
Category				Quite Active			

Meeting III							
N=32	Visual	Oral	Listening	Motor	Writing	Mental	Emotional
Amount	84	93	98	99	105	91	102
Mark	65,63	72,66	76,56	77,34	82,03	71,09	79,69
Average				75%			
Category				Active			

The table above shows that student activity at each meeting has increased as seen in the percentages and criteria. Student activity at the first meeting was 59% which was in the active category because at the first meeting there were students who were not present and did not listen to the teacher's explanation. For student activity at the second meeting, 69% were in the quite active category, which had increased from the first meeting. And for student activities at the third meeting, it was 75%, where at the second and third meetings students were present and had participated in several indicators of student activity. The average percentage of students from meetings 1 to 3 is 68% and is in the quite active criteria. This shows that student activity in high school with the application of the Edmodo-based blended learning model for physics learning outcomes is quite active.

Discussion

Based on the results of research analysis, there are differences in learning outcomes in the control class and the experimental class due to the influence of learning using Edmodo-based blended learning. The difference in learning outcomes for the experimental class and the control class can be seen from the cognitive aspect through the question instrument, where the experimental class answered more correctly than the control class, although not all students answered correctly.

The learning outcomes of one student are different from another. This difference is caused by factors that influence it, including: a) Factors that originate from oneself. These factors have a very big influence on students' study progress, for example interests, talents, health, study habits and independence, b) Factors -factors that come from outside the student themselves. These factors influence the progress of students' environmental studies, studies of the natural environment, family environment, community environment, and other factors, namely schools and school equipment.

Through the blended learning model, students do not only rely on the material provided by educators, but can search for material in various ways, including searching the library, asking classmates or friends online, opening websites, searching for learning materials via search engines, portals, blogs, or other media in the form of learning software and learning tutorials. This is also in accordance with the opinion of (Mega Furi, 2021) stating that treatment using the Edmodo-assisted learning model increases student independence so that this learning can make students more active independently.

The increase in student learning activities taught using Edmodo-based blended learning is in line with the results of Mery's (2017) research that the application of Edmodo-based blended learning can increase student activity during the learning process. Mega Furi stated that the treatment using the Edmodo-assisted learning model increased student independence so that this learning could make students more active independently (Mega Furi and Ida Wahyuni, 2021).

The low level of student activity at the first meeting was caused by the experimental class students having never been exposed to blended learning and not knowing this model well. Apart from that, students have never used Edmodo learning media so students still don't understand how to use this learning application. At the next meeting, students had begun to adapt to the blended learning method and the Edmodo application, so that many students began to be active when learning took place. This is in line with research by Franciska Ayuningsi (2020) which stated that there was an increase in understanding of concepts before and after being given treatment in the experimental class and control class.

CONCLUTION

From the research results it can be seen that the initial ability of experimental class students is low, namely 63.13. After receiving treatment using Edmodo-based blended learning, the static fluid learning outcomes were 83.28 in the good category. Learning outcomes in the control class from 56.87 to 63.28. This means that learning using Edmodo-based blended learning can improve learning outcomes significantly and is better than conventional learning outcomes.

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