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The Application of *Blended Learning* Using *Edmodo* Media to Increase Learning Motivation and Achievement in *Learning* Physics

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Abstract

The technology of learning in 4.0 requires students to be more active in obtaining information both at school and community. In order to engage students how to use their own effort and hard work to find knowledge as a source of learning, Indonesia has already implemented e-learning media. However, learning media is still less effective in influencing the way of learning in SMA Negeri 1 Moyo Hulu, it because of motivation and learning achievement to decrease. Therefore, research was conducted on the application of blended learning using Edmodo application to increase motivation and achievement in learning physics in first grade of SMA Negeri 1 Moyo Hulu. The purpose of this research are; 1) To analyze the factors that can increase motivation to learn physics in first grade of SMA Negeri 1 Moyo Hulu, 2) to identify the differences between the application of blended learning using Edmodo application and conventional to increase learning motivation and achievement of SMA Negeri 1 Moyo Hulu, and 3) To analyze the effectiveness of applying blended learning using Edmodo application to increase learning motivation and achievement of SMA Negeri 1 Moyo Hulu. The researcher used quasi-experimental research with Nonequivalent control group design. The sampling technique used is cluster sampling. Data collection techniques using observation, questionnaires, tests, interviews, and documentation. Instrument test using validity test and reliability test. Furthermore, the data were analyzed using factor analysis techniques, different test analysis (paired sample t test), and effectiveness analysis. Based on the results of the research that has been done, it was found that the factors that can increase the motivation to learn physics in first grade of SMA Negeri 1 Moyo Hulu, consist of 4 factors namely; family, school environment, educators and learning media. Learning media is an important factor, where the application of Edmodo greatly influences learning motivation and achievement with an average value comparison of experimental class motivation 8,69> 5,94 control class motivation, and experimental class achievement 33,94> 27,42 control class achievement, so it can be concluded that edmodo is effective to be applied in the physics learning process at SMA Negeri 1 Moyo Hulu.

Keywords: *Blended Learning, Edmodo, Motivations, Achievement*

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INTRODUCTION

Learning technology in the era of the industrial revolution 4.0, requires students to be more active in obtaining information both at school and in the community (Doringin et al., 2020). Indonesia has currently implemented *e-learning* learning media with the aim of training students to find information and materials with their own efforts and initiatives (Jayawardana, 2017). The presence of *e-learning* provides new innovations in the world of education with the widespread use of electronic communication media, so that in the world of education it is very necessary to help Science Technology (IPTEK) (Restu Ningsih et al., 2021). As per the statement (Mustofa & Riyanti, n.d.) that *e-learning makes learning* easier both in terms of material, placement, processing, and assessment as well as the environmental conditions desired by students. So the application of *e-learning* can increase learning motivation and learning achievement so that learning objectives are achieved (Islamiyah & Widayanti, 2016).

Learning does not rely solely on technology, because learning is essentially more about the process of interaction between educators, students, and learning resources (Usman, 2019). Although *e-learning* can be used independently by students, the existence of educators becomes very meaningful as a companion that functions to motivate students in the learning process (Purwasih & Apsari, 2021). In other words, the face-to-face process

is important and cannot be abandoned in the learning process. So that by combining online and face-to-face learning, it is possible to achieve effective learning (Nana & Surahman, 2019). The combination of several learning models is called *Blended learning*.

Blended learning is a form of learning that combines traditional (*face-to-face*) learning with *online* learning (Sari, 2013). *Blended* learning in this study is considered as the interaction of face *to face* learning with learning with *an online* approach (Kuntarto & Asyhar, 2016). *Online* learning in this study was carried out with *the edmodo* application. Edmodo is a social network for learning based on *learning management system* (LMS). *Edmodo* provides facilities for educators and students, including as a safe place to communicate, collaborate on sharing learning content and applications, completing homework for students, discussions in virtual classes, *online* tests and assessment of learning process results (Muhajir et al., 2019). *Edmodo* is very comprehensive as a *course* where*gement system* when compared to *Moodle*, where access is faster and easier to use (Nugraha et al., 2020). Edmodo has three functions in the learning process, namely substitute, companion, and complementary functions (Iriyani et al., 2017).

SMA Negeri 1 Moyo Hulu is a high school located in Moyo Hulu sub-district, Sumbawa regency. The learning process in the school is an important concern because there is still a lack of motivation of students in learning Physics which causes student learning outcomes to be low. (Source: Archives of SMA Negeri 1 Moyo Hulu) Based on data from SMA Negeri 1 Moyo Hulu in the last 3 years (2020-2022) the average physics score is 70.4 lower than chemistry lessons which are 75 and biology which is 76.8. This is because physics material must require students to understand physics equations or formulas, which causes students to be lazy to repeat learning at home. Meanwhile, the learning motivation of students can be seen from the interestingness and inability of the subjects presented and the learning process that takes place (Ekawati, 2018). The achievement of learning motivation is influenced by several elements, one of which is the educator element. Educators must be able to motivate students to be more active in learning. The more active students are in learning, it is directly proportional to the increase in learning motivation and learning achievement of students (Khaeruddin, 2012).

Learning achievement is a learning result achieved after going through the process of teaching and learning activities. Learning achievement can be demonstrated through the grades given by an educator from the material that has been learned by the learners. Every learning activity certainly always expects to produce maximum learning (Syafi'i et al., 2018). In the process of achievement, learning achievement is greatly influenced by various factors. One of the main factors that are very influential in the success of learning is the existence of educators (Sutardi & Sugiharsono, 2016). In improving learning achievement, it can be supported by *the application of edmodo* media at SMA Negeri 1 Moyo Hulu. In accordance with Ekawati's research (2018), that the application of *blended* learning with *edmodo* applications based on the *PDEODE* learning strategy can increase the learning achievement of students in class VIIIF MTs N Magelang, as evidenced by the percentage of student learning completeness, namely precyclical to cycle 1 there is an increase of 31%, an increase from cycle I to cycle II of 62%, and an increase from precyclical to cycle II of 93%. In addition, edmodo media also affects learning outcomes at SMK Anwarul Maliki Sukorejo Pasuruan East Java with a T *pairet test* that shows a significance value of 0.000 with a significant < of 0.05 in the conclusion that Ho is rejected and Ha is accepted, meaning that the average score before and after the application of *edmodo* media is that there is an influence on learning outcomes (Maghfiroh et al., 2017).

In this study, what is a novelty is the merger of the *blended* learning model with *Edmodo* media to review the increase in learning motivation and student learning achievement. *Edmodo* itself has been widely researched and can provide benefits in learning. One of the studies conducted by Ardian Wicaksono and Supri Hartanto that *Edmodo* can increase student learning motivation because it has fun and persuasive features. Thus, to be able to increase learning motivation and student learning achievement, there needs to be innovation carried out so that there is a need for research related to learning motivation factors, the application of *Blended Learning* using *Edmodo* media with conventional learning to increase learning motivation and learning achievement in physics class X SMA Negeri 1 Moyo Hulu and the effectiveness of learning *Blended Learning* uses

Edmodo media to increase learning motivation and achievement in learning physics class X SMA Negeri 1 Moyo Hulu.

METHOD

Research on the Application of *Blended Learning* using *Edmodo* media to increase learning motivation and achievement in learning physics class X was carried out at SMA Negeri 1 Moyo Hulu Jl. Raya Sumbawa Besar – Semamung Marga Karya, Moyo Hulu District, Sumbawa Regency. The time of this study was conducted from September 2022 – October 2022. The method in this study uses *quasi-experimental* methods or pseudo-experiments*. Quasi-experimentation* is an experiment that has a control group but does not fully function to control the outer variables that affect the implementation of the experiment (Sugiyono, 2011). The design used in this study is a *Nonequivalent control group design.* According to (Arikunto, 2010) the pattern of *Nonequivalent control group design* is as follows:

0_1 x 0_2
0_3 - 0_4

Description: 0_1 = experimental class before treatment
0_2 = experimental class after treatment
0_3 = control class before the learning process
0_4 = control class after the learning process
X = Application of *blended learning* using *edmodo* media
\- = Conventional k method

The population in general is the entire object of study covering all elements contained in the research area (Danuri & Maisaroh, 2019). The population in this study was all students of class X SMA Negeri 1 Moyo Hulu for the 2022/2023 academic year which amounted to 130 students divided into 4 classes. The sample is part of the population under study and can represent the entirety of the object under study (Sugiyono, 2011). In this study, the sampling technique used was *cluster sampling. Cluster sampling* is a technique used if a heterogeneous population is encountered where the sub-population is a group (*cluster*) that has heterogeneous properties while in the sample stratification each sub-population is homogeneous (Amirullah, 2015). The samples at SMA Negeri 1 Moyo Hulu are taken as many as 2 classes, and those who will be experimental classes and control classes will be selected directly according to the homogeneity and normality of the 4 X classes in SMA Negeri 1 Moyo Hulu. This research there are several variables that need to be considered as follows: Motivational factors and Blended Learning Using *Edmodo* Media as independent variables (free variables), Learning Motivation and *Learning* Achievement as dependent variables (bound variables), control variables (controlling variables) namely educators who teach experimental classes and control classes are the same, namely Physics educators of Class X SMA Negeri 1 Moyo Hulu, as well as the time and learning materials of the two groups in this study are also relatively the same. The data in this study consisted of:

a. Primary data is data obtained by researchers directly from respondents (Saryanti, 2010). Primary data in this study was obtained from the data from the questionnaire results learning motivation factors, data on the results of the learning motivation questionnaire and data on learning achievement outcomes distributed to students of class X SMA Negeri 1 Moyo Hulu .
b. Secondary data in this study were obtained from the results of literature studies conducted by researchers (Saryanti, 2010). The secondary data in this study wasobtained from pts data for class X students of SMA Negeri 1 Moyo Hulu.

The data collection techniques in this study used:

1. Observation Techniques

Observations made by researchers include: observations before research to identify problems experienced by educators and experienced by students , observations made when *learning belended learning* Using *Edmodo* media to find out the learning motivation and learning achievement of students. Observation is very important before taking action .

2. Questionnaire Technique

Questionnaire is a data collection technique carried out by giving a set of questions or written statements to respondents to be answered (Sugiyono, 2011). The questionnaires in this study amounted to 2 questionnaires, before compiling the questionnaire, first make a grid. There are 2 questionnaire grids in this study, including: a grid of learning motivation factors and a grid of student learning motivation. The questionnaire on learning motivation factors consists of 30 questions given before applying *belended learning* using *edmodo* media and analyzed using factor analysis. The learning motivation questionnaire consists of 30 questions that will be given before and after students are applied *belended learning* using *edmodo media.* The questionnaire is used to find out whether students are motivated by the media that has been applied.

3. Test Technique

A test is a tool used to find out and measure aspects of student behavior (Achadah, 2019). Instrumen in this study is in the form of a multiple-choice question test, before compiling multiple-choice questions, researchers compile a grid of questions. Multiple-choice questions are carried out by choosing one of several possible answers that have been provided. The *possible* answer (option) consists of five answers, namely one correct answer and four *detractors (distroctors)* attached to appendix 9. Each correct answer is scored 1 (one) while for the wrong answer it is scored 0 (zero) (Parnabhakti & Puspaningtyas, 2020). To find out the achievements of students, educators must determine the intervals of learning achievement scores as follows:

4. Interview Techniques

Interviews were conducted to collect data from educators and students related to physics learning. Interviews are conducted with educators and learners before action is taken. Interviews are used to find out the obstacles or difficulties of learning physics from educators and students, to obtain valid data related to existing problems and compare the truth of the observation data.

5. Documentation Techniques

Documentation techniques are used to obtain information from various written sources or documents that exist in respondents (Arikunto, 2010). This documentation method is used to find out photos of activities during observation / research in experimental classes and control classes during learning.

The test instruments in this study are as follows:

1. **Validity Test**

In this study, there are several instrument data that will be tested for validity, including validity test data for motivational factors, validity test data for learning motivation questionnaires and validity test data on learning achievement. The results of the study are said to be valid if there are similarities between the collected data and the data that actually occurs in the object under study (Arikunto, 2010). It is said to be valid if the instrument can be used to measure what should be measured. A valid measurement means the measuring instrument used to obtain the data. Instrument validity testing is performed using correlation with *the product moment* formula with the help of the SPSS application.

The validity of a question item can be seen in the SPSS *output* , namely by comparing the calculated value with the table value . If the calculated value > the table value , it can be said that the item is valid. Conversely, if the calculated value <

the table value , then the item is invalid (Sugiyono, 2011). So it needs to be replaced or aborted the validity of the sample used. After the questionnaire is validated and declared valid, the questionnaire and test are declared suitable for research.

2. **Reliability**

Reliability points to the notion that an instrument istrustworthy enough to be used as a data collection tool , because the instrument is already good (Sugiyono, 2011). The instrument reliability test in this study was carried out using the *alpha cronbach* method with the help of SPSS.

The data analysis techniques in this study are:

1. Factor Analysis

This study used exploratory factor analysis techniques . Factor analysis is a study of interdependence between variables that aims to detect a new set of variables with a smaller number than the previous variable (Metriana, 2014). Exploratory factor analysis is a method to form a theory (Andri et al., 2020). According to (Rismawati & Khairiati, 2020) the analysis of exploratory factors is composed of several steps , namely:

a. Testing the Feasibility of the Analysis

Analysis feasibility testing is used to see the fullness of assumptions as a condition for factor analysis. The feasibility test criteria of the analysis in this study used the price of the *Kaiser- Meyer-Olkincoefficient* (KMO) and the *Bartlett test* of Sphericity and *the MSA (Measure of* Sampling) measurement. The KMO test is useful for viewing the adequacy of the analyzed sample . The sample is said to meet if its KMO *sampling adequacy*value is more than 0.50. The Bartlett test of *Sphericity* test is used to test the normality of the data. Data is said to be normal if the calculated significance value is smaller than the predetermined significance value. In this study, the significance value set was 0.05. *The MSA (Measure of Sampling)* test is a test used to measure homogeneity between variables and perform filtering between variables so that only eligible variables can be further processed. Where the MSA value is 0.5 – 1.0.

b. Perform extraction

Extraction is performed in order to get fewer factors than the overall number of factors that have been set. The method used to perform factor extraction is *Principal Component Analysis* (PCA)

c. Determining the number of factors

The determination of the number of factors is based on the magnitude of the *eigen value* of each emerging factor. *Eigen value* is the number of variants described by each factor. The core factors chosen are those that have *an eigen value* of > 1.

d. Rotating

Rotation is a mechanism for rotating axes close to the coordinates of a point or variable. Factor rotation is carried out to facilitate interplay in determining which variables are listed in a factor because sometimes there are several variables that have a high correlation with more than one factor or if some of the *loading* factors of the variable are below the smallest that has been set. Rotating factors to clarify the position of a variable by using the *varimax* method.

2. Analyze the difference test

a. Normality Test

Normality tests are performed to determine whether the data is normally distributed or abnormal . Data is the most important assumption in parametric statistics, so testing of data normality must be carried out so that the assumptions in parametric statistics can be met (Arikunto, 2010). There are many ways that can be done to test the normality of a sample, one of which is to use the *smirnov kolmogorof technique* with the help of the SPSS application.

The rule used to test normality is scores. Significant that exists in the results of the calculation *of kolmogorof smirnov.* If the significant number in the *kolmogorof smirnov* calculation results is smaller or equal to 0.05, then the data is normally

distributed, but if it is greater than 0.05, then the data is not normally distributed (Sugiyono, 2011).

b. Homogeneity Test

The *homogeneity or homogeneity of variance* test is a test carried out to find out whether research data from two or more data distributions have the same variance (Arikunto, 2010). In addition, the homogeneity test is also a condition of the t-statistical test.

d. T-test

The T-test is a differential test to determine whether there is a significant mean or average difference between 2 groups with an interval or proportional data scale (sugiyono, 2011). Assumptions that must be met in the t-test include that the data distribution must be normal and the data variance must be uniform (Arikunto, 2010). To test this hypothesis, the *Paired Sample T-Test* test is used. The criteria used in decision making are if the value of t counts > t table, then H O is rejected, and if the value of t_{counts} < t of the table, then H_O is accepted, in testing the hypothesis, the researcher uses the help of the SPSS program with the decision-making criteria based on probability value is if the probability > 0.05, then Ho is accepted and if the probability < 0.05, then Ho was rejected (Sugiyono, 2011).

3. Effectiveness Test

The data analysis technique using paired *sample t test or paired test* aims to analyze the data obtained from the same sempel, namely data on learning outcomes of the experimental class with the hypothesis H_O = no increase from pretest to posttest results after being given dosing, and Ha = there is an increase from pretest results to posttest after being given dope (Susanto & Akmal, 2018). Decision-making criteria from the results of paired tests, if the significance value (2 –tailed) < 0.05 then Ha is accepted, and if the significance value (2 –tailed) > 0.05 then Ha is rejected (Sugiyono, 2011). The results of the paired test will determine the effectiveness of the application of *blended* learning using *edmodo* media in increasing learning motivation and student learning achievement, with the decision that if Ha is accepted, the learning media is categorized as effective, and if Ha is rejected, it means that the learning media is not effectively used.

RESULTS AND DISCUSSION

1. Research Results

Based on the research conducted, results were obtained which included three parts, namely: (1) factors that can increase the motivation to learn physics class X SMA Negeri 1 Moyo Hulu, (2) differences in the application of Blended Learning Using *Edmodo* media with conventional learning to increase learning motivation and learning achievement in physics class X SMA Negeri 1 Moyo Hulu, (3) the effectiveness of the application of *Blended Learning* using *Edmodo* media to increase learning motivation and achievement in learning physics class X SMA Negeri 1 Moyo Hulu.

The motivational factors for learning physics class X SMA Negeri 1 Moyo Hulu can be known using the factor analysis method. The steps for factor analysis are as follows:

a. Testing the Feasibility of the Analysis

This step uses *Kaiser- Meyer-Olkin*(KMO*)* and *Bartlett test of Sphericity* as well as *MSA (Measure of Sampling)* measurements. The KMO test is useful for viewing the adequacy of the analyzed sample . The sample is said to meet if the KMO *sampling adequacy*value is more than 0.50 (Elfira, 2014).

Table 1. KMO Scores and *Bartlett's Test of Sphericity* of learning motivation factors.

KMO *and Bartlett's Test*		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.584
Bartlett's Test of Sphericity	*Approx. Chi-Square*	102.912
	Df	6
	Sig.	.000

Based on Table 1 KMO *sampling adequacy* shows the numbers 0.584 > 0.5 so that the variables of the indicators can be further analyzed. In addition, *Bartleet's Test of Sphericity of* 102.912 with a sig of 0.000 < 0.05 so that the sample data is normally distributed, is eligible to perform a factor analysis.

b. Performing extraction

The method used to perform factor extraction is *Principal Component Analysis* (PCA). The number of indicators to be extracted is seen in table 2 contribution of extracted indicator results.

Table 2. The contribution of the extracted indicator results

Communalities		
	Initial	**Extraction**
Family	1.000	.807
School Environment	1.000	.679
Educators	1.000	.790
Learning Media	1.000	.809
Extraction Method: Principal Component Analysis.		

From table 2 the contribution of the extracted indicator results shows all variables have comumunalities above 0.5 with a family factor *comumunalities* value of 0,807, a school environment factor of 0,679, an educator factor of 0,790, and a learning media factor of 0,809. Then no indicators are issued because they are able to explain each indicator well. The greater the *resulting communalities* value indicates that it is more closely related to the variables to beformed (Dina, 2020).

c. Determining the number of factors

Total v*ariance explained* is used to determine the factors formed and the core factors selected are factors that have *an eigen value* of > 1(Dina, 2020). Table 3 PCA Extraction Results.

Table 3. The number of factors resulting from the extraction

	Extraction Sums of Squared Loadings	
Total	**% of Variance**	**Cumulative %**
1.961	49.031	49.031
1.124	28.089	77.121

Table 3 shows the number of factors resulting from the extraction. The number of extraction factors (PCA), from the 2 factors formed, it is seen that all factors have an eigenvalue of > 1, for example in the column total factor 1 = 1,961 >1 and total factor 2 = 1,124 >1.

d. Rotating

Variables that have been extracted will be rotated because there are several variables that have a high correlation with more than one factor or if some of the *factors loading* from variables are of a value below those that have been set. Table 4 *Component Matrix* before *Varimax rotation.*

Table 4 matrix rotation results

Rotated Component Matrix[a]		
	Components	
	1	**2**
Learning Media	.899	.029
Educators	.871	.176
Family	-.068	.896
School Environment	.363	.740
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalization. [a]		
a. Rotation converged in 3 iterations.		

Component Matrix after rotation in Table 4 matrix rotation results show that all variables have a group of factors.
Factor 1 has 2 variables, namely educators and learning media
Factor 2 has 2 variables, namely family and school environment

The required steps that must be met before conducting a different test are as follows:

a. Normality Test

Normality tests are performed to determine whether the data is normally distributed or abnormal . The results of the normality test Pretest of the motivation experiment on the *Kolmogorov-Smirnov* table showed a significance value of 0.200, the posttest significance value of the experimental class Motivation showed a value of 0.200, the prettest of the control class of Motivation showed a value of 0.200 and the posttest of the control class Motivation had a value of 0.200. While the significance value of the achievement experimental class prettest in the *Kolmogorov-Smirnov* table shows a value of 0.059, the posttest significance value of the achievement experimental class shows a value of 0.200, the prettest of the achievement control class shows a value of 0.074 and the posttest of the achievement control class has a value of 0.073. According to the rules of the *Kolmogorov-Smirnov* normality test, it is explained that if the significant number in the *kolmogorof smirnov calculation results* > 0.05, then the data is normally distributed. So, the presentation of table data The results of the Normality Test can be concluded that the distribution of prettest posttest value data of experimental classes and motivational control classes and learning achievements is normally distributed.

b. Homogeneity Test

A homogeneity test is a test performed to find out whether research data from two or more data distributions have the same variance. The results of the homogeneity test of the experimental class and the learning motivation control class obtained a significance result of 0.088 and the learning achievement had a significance result of 0.617 showing that in the experimental class and the control class had motivation and achievement derived from the same variant (homogeneous). In accordance with the homogeneity test requirements if the significance value of ≥ 0.05 shows that the data group comes from populations that have the same variance (homogeneous) (Sugiyono, 2011).

c. T-test

In this study using the *Paired Sample T-Test* or paired test, it aims to determine whether there is a significant difference in mean or average between 2 groups. In table 5 of the experimental class and control class *Paired Samples Test* results

Table 5. the results of the *Paired Samples Test*

Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Prettest motivation experiment - motivational experiment posttest	8.697	9.719	1.692	12.143	5.251	5.140	32	.000
Pair 2	prettest Motivation control - posttest Motivation control	5.939	8.295	1.444	8.881	2.998	4.113	32	.000
Pair 3	prettest Achievement Experiment - posttest Achievement Experiment	33.939	13.565	2.361	38.749	29.130	14.373	32	.000
Pair 4	prettest Achievement Control - posttest Achievement Control	27.424	17.639	3.071	33.679	21.170	8.931	32	.000

Based on table 5 the results of the *Paired Samples Test* test of the experimental class on motivation obtained a significance of 0.000 with a calculated t value of 5.140 > t table 2.03693 and the motivation control class obtained a significance value of 0.000 with a calculated t value of 4.113 > t table 2.03693. In the achievement experimental class, a significance of 0.000 was obtained with a calculated t value of 14.1373 > t table 2.03693 and the achievement control class obtained a significance value of 0.000 with a calculated t value of 8.931 > t table 2.03693. Complies with *Paired Samples Test* test requirements if the sig value. (2-tailed) < 0.05 and the value of $t_{count} > t_{table}$, then Ha is accepted (Sugiyono, 2011). Thus it can be said that there were significant differences between the experimental group and the control group on motivation and learning achievement.

d. Effectiveness test

Data analysis techniques use *Paired sample t* test or paired test. In table 6 the results of the *Paired Samples Test* for motivation and achievement of the experimental class are as follows:

Table 6. The results of the *Paired Samples Test* for motivation and achievement

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	Df	Sig. (2-tailed)
Pair 1	motivational prettest - motivational posttest	8.697	9.719	1.692	12.143	5.251	5.140	32	.000
Pair 2	Prettest Achievement - PostTest Achievement	33.939	13.565	2.361	38.749	29.130	14.373	32	.000

Based on the results of the *Paired Samples Test* test in the experimental class before applying blended learning using edmodo media and after applying *blended learning* using *edmodo* media on motivation and achievement. The data obtained in the *paired sample t test* on learning motivation was 5,140 > 2.03693 and a significance value of 0.000. In paired *testing the t test* sample on learning motivation was 14.373 > 2.03693 and a significance value of 0.000. So it can be concluded that the results of the paired test of the application of blended learning using edmodo media in increasing learning motivation and student learning achievement, with Ha's decision to be accepted, *blended learning* using *edmodo* media is categorized as effectively used.

2. Discussion

a. Factors that can increase the motivation to learn physics class X SMA Negeri 1 Moyo Hulu are family factors, school environment factors, educator factors, and learning media. The learning media factor is the most superior factor, because it has an Extraction value of 0.809 or 80.9% when compared to family factors with an Extraction value of 0.807 or 80.7%, school environment factors with an Extraction value of 0.679 or 67.9% and an educator factor with an *Extraction* Value of 0.790 or 79%. According to the research conducted (Yuliani H & Winata, 2017) stated that learning media plays a positive role in increasing student learning motivation, in this case, if the use of learning media is less, it will affect the level of learning motivation that decreases so it is said, the increase in learning media will be followed by an increase in learning motivation.

From the PCA extraction data, the determination of the number of factors, and the rotation of learning media have superior value. PCA extraction has a value of

0.809 or 80.9%, the determination of the number of factors has a value of 1.961, and the rotation has a value of 0.899. So that a test of the application of *blended* learning was carried out using *edmodo* media as a supporting medium in increasing learning motivation and learning achievement in physics class X SMA Negeri 1 Moyo Hulu. This is in line with the opinion of Hamalik (Tirtiana, 2013) who stated that the use of learning media in the teaching and learning process can arouse new desires and interests, arouse motivation and stimulation of learning activities, and even bring psychological influences on students.

b. Differences in the application of *Blended Learning* Using *Edmodo* media with conventional learning to increase learning motivation and learning achievement in physics class X SMA Negeri 1 Moyo Hulu.

From the data obtained motivation and learning achievement have a high score in the, experimental class, as desired so that significant learning outcome value data is obtained, there are differences between students who do *blended* learning using *Edmodo* media with conventional learning. Students who do *Blended Learning* using *Edmodo* media with students who do conventional learning have different learning motivation values and learning achievements. In addition, experimental data on learning motivation and learning achievement are higher compared to data on control of learning motivation and learning achievement.

The results of research related to the difference in the average score of experimental classes and control classes for the application of blended learning using edmod media o on learning motivation and learning homework are in line with previous research conducted (Widyasari & Rafsanjani, 2021) with the research title The Application of *Blanded* Learning Can Increase Student Motivation and Learning Outcomes in Distance Learning. The implementation of this study aims to analyze the influence of the application of synchronous and asynchronous-based *blended* learning on inflation, monetary policy, and fiscal policy as an effort to increase the motivation and economic learning outcomes of students of SMAN 1 Puri Mojokerto in distance learning. This research uses a type of pseudo-experimental research with the form of design, namely *post-test only control group design.* This study involved 30 students with class XI IPS 3 as the experimental group and class XI IPS 2 as the control group. The research instrument uses questionnaires to determine learning motivation and posttest questions to measure economic learning outcomes. Based on the findings of data analysis tested with an independent sample t-test, the average score of the experimental class of learning motivation and learning outcomes was higher than the average score of learning motivation and learning outcomes of the control class. So this study showed significant differences in motivation and learning outcomes between the experimental class and the control class. Thus, it can be concluded that the motivation and economic learning outcomes of students can be improved by the application of synchronous and asynchronous-based *blended* learning in distance learning.

From the results of interviews with students that the learning media applied is very good and interesting, the learning process is also not boring or monotonous, so students want to keep up with learning. Meanwhile, in conventional learning, the learning process is carried out in the classroom, students can immediately see and listen to explanations from the teacher and if there is something that is not understood, usually ask questions immediately and also the teacher can directly explain, and based on interviews conducted to students that they quickly understand the material if learning directly because they can directly see the jabaran of the material presented by the educator

c. Effectiveness of the application of *Blended Learning* Using *Edmodo* media to increase learning motivation and achievement in learning physics class X SMA Negeri 1 Moyo Hulu.

The results of the paired test of the effectiveness of the application of *blended learning* using *edmodo* media in increasing motivation and learning achievement of

students, with Ha's decision to be accepted, *blended learning* using *edmodo* media is categorized as effectively used. In accordance with the statement (Abdul Kadir, 2020) seen from the ability of educators, student activities, student responses, and the results of data analysis, it can be seen that 87% of students are complete in learning mathematics using *edmodo* so that it is effectively applied in MAN Lhokseumawe.

Blended learning is a form of learning that combines traditional (face-to-face) learning with online learning, with the aim of maximizing learning, where face-to-face learning can be done with learners directly involved in the experience, while the*) online* part can provide information-rich multimedia content anywhere and anytime as long as the learner has an internet connection.

The use of Edmodo media has many benefits in the learning process, which can increase student learning achievement, it is hoped that it can increase independence in student learning because the help of *Edmodo* media can increase the achievement of students in learning, make students more enthusiastic in learning and add new skills to students, and also make it easier for students to have discussions with friends class and educators without having to meet face to face and can be done anytime and anywhere without being limited by space and time.

CONCLUSION

Based on the results of data analysis, it can be concluded that The dominant factors can increase the motivation to learn physics class X SMA Negeri 1Moyo Hulu. Consists of four factors and the learning media factor is the most superior factor, because it has an Extraction value of 0.809 or 80.9% when compared to family factors with an Extraction value of 0.807 or 80.7%, school environment factors with an Extraction value of 0.679 or 67.9% and an educator factor with an *Extraction* Value of 0.790 or 79%; There are differences in the application of Blended Learning using Edmodo media with conventional learning to increase learning motivation and achievement in learning physics class X SMA Negeri 1 Moyo Hulu. This, can be proved by a significance value of 0.000 < of 0.05. So, Ha is accepted, meaning that there is a significant difference in *Blended Learning* learning using *Edmodo* media with students using conventional learning**;** Application of Blended Learning Using Edmodo Media is effectively used to increase learning motivation and achievement in learning physics class X SMA Negeri 1 Moyo Hulu. This, can be proved by a significance value of 0.000 < of 0.05. So, Ha is accepted, meaning *that blended learning* using *edmodo* media is categorized as effective to use.

SUGGESTIONS

Based on the analysis, discussion and conclusions of the research conducted, the suggestions given are as follows:

a. Studies can be carried out from factors that affect the learning motivation of students so that they can develop learning motivation in the learning process.
b. This research can be used as a reference in developing new innovations in learning methods in blended learning, especially outside of school. Further research is expected to form an independent attitude from students by applying the learning process at home using edmodo media in obtaining material easily without any direction from educators.
c. It is hoped that in the next study, testing the use of edmodo learning media can be carried out in each subject in school with the aim of determining the effectiveness of the use of edmodo media in eachsubject.

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