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APPLICATION OF PROBLEM-BASED LEARNING MODELS THROUGH ONLINE LEARNING ON LEARNING MOTIVATION STUDENTS OF SMAN 3 ENREKANG

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ABSTRACT

Online learning requires teachers' creativity to increase students' motivation to learn. This study aimed to determine students' motivations using a problem-based model during online learning. This research was experimental with a pre-and post-test control group design. The population in this study was all students of MIPA class XI, a total of 205 people. The sample for this research was class XI MIPA 1, which amounted to 32 people, and class XI MIPA 2, which amounted to 32 people. The sampling technique used was probability sampling (random sampling). The instrument used was a learning motivation questionnaire. The data were analyzed with the Independent Samples t Test. The results showed a sig. (2-tailed) value of 0.000 ($p < 0.05$), meaning that there are differences in the learning motivation of students with a problem-based learning model through online learning and those without using problem-based learning in class XI MIPA students of SMAN 3 Enrekang. According to this study, teachers can apply a problem-based learning model to increase students' motivation to learn.

Keywords: Learning models; problem-based learning; learning motivation

1. INTRODUCTION

Education is one of the most important places to focus attention. One of the functions of education is to change mindsets to improve individual quality so that they can compete in the 21st century. However, the present educational system has failed to provide students with critical thinking, communication, collaboration, creativity, and innovation. The COVID-19 pandemic has made it worse for students to have limited movements. According to Hastuti, Widowati, and Setiwarno (2018), students should practice critical thinking skills to solve problems.

The learning process must be interactive, inspiring, entertaining, rewarding, and motivating for students to participate actively, based on their talents, interests, and physical and psychological development. The teachers need to switch from teaching lower-order thinking skills to higher-order thinking skills or critical thinking skills (Nurdyansyah & Amalia, 2018).

Problem-based teaching is an effective approach to teaching higher-order thinking processes. It helps students process ready-made information in their minds and compile their knowledge about the social world and its surroundings. That learning is appropriate for developing basic and complex knowledge (Ratumanan in Trianto, 2010). According to Prasetyo and Nisa (2018), problem-based learning (PBL) is practical in teaching higher-order thinking processes because it helps and facilitates the student's ability to find and process information in their minds and then analyze knowledge through observation and investigation. Students learn about the social world and the surrounding environment. Muhajirin (2018) states that there are significant differences in motivation to learn physics between students with the PBL model and conventional learning.

State Senior High School (SMA) 3 Enrekang is one of the schools that has implemented online learning during the COVID-19 pandemic. Since the literature review concluded that problem-based learning benefits students, the researchers attempted to implement it at SMA Negeri 3 Enrekang. This study aimed to compare students using problem-based learning models to those using traditional learning models to ascertain which group of students was more motivated to learn.

2) METHODS

This research used a quantitative, quasi-experimental model to compare one treatment with another to determine the possibility of causation. The research design used in this study was a "pre-test, post-test, control group design." The experimental and control groups were compared using this design, and the groups were chosen and assigned at random. The population in this study were all students in class XI MIPA at SMAN 3 Enrekang, which consisted of six classes with a total of 205 students. The data collection technique used a motivational questionnaire before and after treatment. The number of items is 20. The data were analyzed using a t-test on independent samples.

3) RESULTS AND DISCUSSION

Learning Motivation of Students Taught Using Problem-Based Learning Models (Experimental Class)

Class XI MIPA-1 SMAN-3 Enrekang served as the experimental group, and it was taught using problem-based learning over the course of three meetings. The students' motivation was measured before and after treatment. Based on the results of the pre- and post-tests of learning motivation in the experimental class, it can be seen from the descriptive analysis that the lowest score, highest score, average, variance, and standard deviation of students' learning motivation have been calculated.

Table 1. Pre-Test and Post-Test Descriptive Statistics of Experimental Class Students' Learning Motivation

Descriptive Parameters	**Statistical Value of Learning Motivation**	
	Pre-test	*Post-test*
Minimum	66	71
Maximum	88	95
Means	74.96	83.34
Standard Deviation	6024	8,450
Variances	36.28	71.39
Range	22	24

The results of the descriptive analysis of the experimental class (XI MIPA 1), which used a problem-based learning model through online learning (table 1), showed the pre-test statistical parameter values of students' learning motivation with a minimum score of 66, a maximum value of 88, the mean value of 74.96, the standard deviation of 6.024, the variance of 36.28, and the range of 22. As for the post-test data on students' learning motivation, statistical parameter values showed a minimum value of 71, a maximum value of 95, a mean of 83.34, a standard deviation of 8.45, a variance value of 71.394, and a range value of 24. The following table shows the students' levels of learning motivation in the experimental class (XI MIPA 1) based on the descriptive statistical data.

Table 2. Categorization of Learning Motivation in The Experimental Class

Category	*Pre-test*			*Post-test*		
	Formula	Frequency	Percentage (%)	Formula	Frequency	Percentage (%)
Low	$x < 73$	13	40.62	$x < 77$	9	28.13
Currently	$73 \leq x < 81$	11	34.38	$77 \leq x < 89$	13	40.62
Tall	$81 \leq x$	8	25	$89 \leq x$	10	31.25
Amount		32	100		32	100

Table 2 above shows the distribution of the learning motivation scores of the experimental class students (XI MIPA 1) with a problem-based learning model through online learning. For pre-test data, students with low learning motivation were 13 students with a percentage of 40.62%. That figure was 34.38% for students with moderate learning motivation. Eight students with a percentage of 25% had high learning motivation. For post-test data, there were nine, or 28.13 percent, students with low learning motivation. For students who have moderate learning motivation, as many as 13 students have a percentage of 40.62%.

The difference between the students' learning motivation before and after treatment with problem-based learning models can be seen based on the average value obtained. The mean value after treatment is higher than the average value before treatment. Eventually, the problem-based learning model allows students to participate in activities related to their everyday lives, so their enthusiasm for learning and understanding what they have witnessed is very high. In the model, students are required to carry out the problem-solving process presented by the teacher so that they will feel challenged in the learning process.

This study is in line with research conducted by (Prasetyo & Nisa, 2018). He found a significant positive effect of the problem-based learning model on curiosity and the output value of science studies. This research is supported by Muhajirin (2018), which states that there are significant differences in motivation to learn physics between students who are taught using the PBL model and conventional learning. The results of this study are also in line with research conducted by Ali (2011), which shows that motivation in problem-based learning has a more effective role than in conventional teaching methods.

Another study that supports this is Mardhiyana (2022) study, which asserts that the problem-based learning model in mathematics can be used as an alternative solution to improve critical thinking abilities and curiosity in solving problems encountered. The results of this research are also in line with research conducted by Munawarah (2017), which states that the use of the PBL model can increase students' curiosity.

Learning Motivation of Students Who Are Taught Without Using a Problem-Based Learning Model (Control Class)

Class XI MIPA 2 SMAN 3 Enrekang, as the control class (without problem-based learning model treatment), were given treatment using conventional learning models with direct learning methods or lecture methods through online learning for three meetings. Based on the pre-test and post-test of learning motivation in the control class, a descriptive analysis can be seen, and the lowest score, highest score, average, variance, and standard deviation of students' learning motivation have been calculated.

Table 3: Pre-Test and Post-Test Descriptive Statistics of Control Class Students' Learning Motivation

Descriptive Parameters	**Statistical Value of Learning Motivation**	
	Pre-test	*Post-test*
Minimum	57	63
Maximum	83	88
Means	68.50	75.68
Standard Deviation	7,282	7,680
Variances	53,032	58,996
Range	26	25

The results of the descriptive analysis of the control class (XI MIPA 2), which used conventional learning models through online learning (table 3), obtained data on the statistical parameter values of the pre-test of students' learning motivation: a minimum value of 57, a maximum value of 83, a mean of 68.50, the standard deviation is 7.282, the variance is 53.032, and the range is 26. As for the post-test data on students' learning motivation, the statistical parameter values are obtained with a minimum value of 63, a maximum value of 88, a mean of 75.68, a standard deviation of 7.68, a variance value of 58.99, and a range value of 25. Based on post-test

descriptive statistical data, the learning motivation of control class students (XI MIPA 2) can be categorized in the following table.

Table 4: Categorization of Learning Motivation in the Control Class

Category	***Pre-test***			***Post-test***		
	Formula	Frequency	Percentage (%)	Formula	Frequency	Percentage (%)
Low	$x < 66$	13	40.62	$x < 72$	7	21.88
Currently	$66 \leq x < 74$	13	40.63	$72 \leq x < 80$	16	50
Tall	$74 \leq x$	6	18.75	$80 \leq x$	9	28.12
Amount		32	100		32	100

Table 4 shows the distribution of the learning motivation values of the control class (XI MIPA 2) of students without a problem-based learning model but only using conventional models through online learning. For the pre-test data on students who have low learning motivation, there are 13 students with a percentage of 40.62%. For students who have moderate learning motivation, as many as 13 students have a percentage of 40.63%. And for students who have high learning motivation, as many as six students have a percentage of 18.75%. For the post-test data of students who have low learning motivation, there are 7 students with a percentage of 21.88%. For students who have moderate learning motivation, as many as 16 students have a percentage of 50%.

Learning motivation taught by using conventional learning models is not increasing because, during conventional learning, the involvement of students in the learning process is lower. Students tend to wait for answers from educators; they don't even try to solve the questions given. Educators are more active than students, so students get bored and become more dependent on the teaching staff, and they are not used to learning on their own without any help or guidance from educators.

Conventional learning also demands more concentration and attention from students. emphasizes explanation of material without giving sufficient time to students to understand the material provided by educators. And finally, conventional learning causes learning in the classroom to be dominated by certain students, so some students feel bored with the learning process.

The results of this study are in line with research conducted by Muhajirin (2018). The results of his research stated that the learning motivation of students who were taught by conventional

learning did not increase significantly because, in conventional learning, students did not conduct experiments. Research conducted by Kusnandar (2019)states that in conventional learning, there is no significant difference in the cognitive learning outcomes and learning motivation of students. The results of this study are also supported by research conducted by Prasetyo and Nisa (2018), which shows that there are differences between the use of problem-based learning methods in the experimental class compared to conventional methods in the control class. The results of the same research were also carried out by Aldi et al., who argued that there was no increase in high learning motivation in classes taught by conventional learning models.

Differences in Learning Motivation of Students who are Taught Using Problem-Based Learning Models and Those Taught Using Conventional Learning Models

In this study, researchers measured students' learning motivation in the experimental class and the control class. The experimental class is XI MIPA 1, which is taught using a problem-based learning model through online learning. While the control class is class XI MIPA 2, which is not taught using a problem-based learning model, The results of testing the hypothesis using the SPSS version 22 for Windows program showed that the hypothesis in this study was accepted and that there were differences in students' learning motivation in the experimental class and the control class. The results are shown in the following table.

Table 5: Hypothesis Test of Learning Motivation Research Results

Independent Samples t Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	Q	Df	Sig. (2-tailed)	Mean Differences	std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Motivation to learn	*Equal variances assumed*	1,542	.219	3,793	62	.000	7.6562	2.0185	3,621	11,691
	Equal variances not assumed			3,793	61,444	.000	7.6562	2.0185	3,621	11,692

Based on the independent sample t-test output table in the equal variances not assumed section, it is known that the sig value is 2. (two-tailed) for learning motivation of 0.000 < 0.05. As the basis for decision-making in the independent sample t-test, it can be concluded that H0 is rejected and H1 is accepted. Thus means that there are differences in learning motivation between students who are taught using a problem-based learning model and students who are taught conventionally at SMAN 3 Enrekang. According to the descriptive analysis, the average value of learning motivation of students taught using the problem-based learning model is greater than the average value of learning motivation of students taught without using the problem-based learning model (conventional learning).

In problem-based learning, students' learning motivation increases because each student is active in the learning process. Learners are directly involved in solving the problems they find. The problem-based learning model in this study provides opportunities for students to carry out activities related to the reality experienced in everyday life, so that their enthusiasm for learning and knowing what they have witnessed so far is very great. In the problem-based learning model, students are required to carry out the problem-solving process presented by the teacher so that they will feel challenged in the learning process.

In contrast to conventional learning, where students are less active in learning, when given practice questions, only certain students can work on them, while other students are only waiting for answers from their friends or educators. Learning motivation taught by using conventional learning models is not increasing because, during conventional learning, the involvement of students in the learning process is lower. Students tend to wait for answers from educators; they don't even try to solve the questions given.

Conventional learning also demands more concentration and attention from students. emphasizes explanation of material without giving sufficient time to students to understand the material provided by educators. And finally, conventional learning causes learning in the classroom to be dominated by certain students, so students feel bored with the learning process.

The results of this study are in line with research conducted by Henita and Margana (2019). The results of his research state that problem-based learning can improve students' critical thinking skills and curiosity. The results of this study are also supported by research conducted by

Fahrunnisa, Arsyad and Muis (2017). The results of his research stated that there was a significant difference between the motivation to learn physics of students who were taught by problem-based learning models and those who were taught conventionally.

The results of this study are also in line with research conducted by Muhajirin (2018), which states that there are significant differences in motivation to learn physics between students who are taught using the PBL model and conventional learning. Research conducted by Hastuti, Widowati, and Setiwarno (2018) states that the problem-based learning model can increase student curiosity, which includes enthusiastic aspects of the scientific process, asking about every step, and seeking information from various sources.

Research conducted by Sadrin, Gummah, and Safitri, (2013) states that there is an influence of problem-based learning models on learning motivation and students' understanding of concepts. The results of this study are also in line with research conducted by Nurawaliyah et al. (2014), which states that there are differences in motivation to learn science and biology between students who are given lessons using problem-based learning models and students who are given lessons using conventional learning. Research conducted by Asnia (2011) states that there is an increase in the average value of learning motivation among students who are taught with problem-based learning models. The results of research conducted by Susanti (2021) state that the PBL learning model can increase students' learning motivation.

The results of this study are in line with research conducted by Prasetyo and Nisa (2018). The results of his research stated that there was a significant positive effect of the problem-based learning model on curiosity and the output value of science studies. The results of this study are also supported by research conducted by Mardhiyana (2022), which states that the problem-based learning model in mathematics can be used as an alternative solution to improve creative thinking skills and curiosity in solving the problems encountered.

CONCLUSION

This study finds that there are differences between the learning motivation of class XI MIPA students at SMAN 3 Enrekang who were taught using a problem-based learning model through online learning and those who were not. The average level of learning motivation among students using the problem-based learning model is higher than the comparable level among students not

using the model (conventional learning). It implies that teachers can use problem-based learning to enhance student motivation. The limitations of this study were the obstacles in conducting research that took place online, so it was not optimal for observing student behavior. So it is recommended to measure subsequent motivation offline.

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