

# The Influence of LMS-Based Blended Learning Models on Learning Motivation and Learning Outcomes in Network Infrastructure Administration.

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## Article Info

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## ABSTRACT

This study aims to determine whether students' motivation and learning outcomes are influenced by applying a blended learning model. The study involved class XI TKJ students at SMK Sakti Gemolong as participants selected using cluster random sampling techniques. The treatment given to the experimental class is in the form of a blended learning model, while the control class is with conventional learning. The research method used is quantitative. Data were collected by questionnaire method and learning achievement test. Analysis of the questionnaire is used to get data on student motivation. Then to analyze the difficulty of learning outcomes is get to obtain data on student learning outcomes. The study found 1) a significant influence of student learning motivation by .209, which means more significant than the level of error (0.05). 2) there is a considerable influence on learning outcomes of .698, which means it is greater than the level of error (0.05). 3) there is effectiveness in increasing students' learning motivation by using blended learning models with a total score gain of 0.2028. Compared to using conventional learning with a total score gain of 0.0735. 4) there is effectiveness in increasing student learning outcomes by using a blended learning model with a total score of 0.4810. Compared to using conventional learning with a total score gain of 0.2176.

**Keywords:** Blended Learning, Motivation to Learn, Learning Outcomes

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## 1. INTRODUCTION

In the era of globalization, the development of technology is now increasingly rapid, inevitably influencing the world of education. The global demand requires the world of education to always adjust technological developments to improve the quality of education, especially in changing the use of information and communication technology for the world of education, especially in the learning process (Budiman, 2017). Teachers can use this to be able to apply the way of learning by using technology.

When observing SMK Sakti Gemolong, researchers found that the lack of student motivation in learning and student learning outcomes is relatively low, or there are still many students who have not reached the minimum completeness criteria in the subject of Network Infrastructure Administration in class XI TKJ. Achievement results for all students reached only 50% obtained from the effects of daily tests. One reason is the lack of material delivered by teachers when learning because Network Infrastructure Administration lessons do a lot of practice. When doing the exercise of learning routing is not optimal, it can be seen from students who ask many times, and many do not understand. So learning becomes less effective.

Based on Sakti Vocational School teachers' sources, the lack of student learning motivation is due to difficult lessons, so students are not interested in the subjects taught. Manggabarani (2016), in his research, said that the reality of the field showed students do not have a high willingness to learn; students still consider learning activities not fun and choose other activities outside the learning context. Another cause is from the teacher himself; the learning model applied is less attractive, so it cannot arouse student motivation. The learning model used by the teacher dramatically influences the success of a student in learning. There is a need for a teacher who can guide students during the learning

process by applying appropriate learning models, methods, and media to be used to influence the success of a student in learning.

Motivation is essential in learning because it determines the level of success or failure of student learning (Kompri, 2016). Learning without inspiration will be challenging to succeed or achieve goals. Because a person has no motivation in education, it will not be possible to do learning activities. Thus, the teacher's role is critical in encouraging student learning by increasing student desire or student motivation to learn. In doing this task, the teacher needs to understand students well and provide or use learning models that are interesting, valuable and can motivate students. Thus the problem is necessary learning models that can arouse learning motivation and improve student learning outcomes, so we need learning that can be interesting and able to take advantage of developments in technology and existing school facilities. The technology-based learning model that utilizes technological developments currently developing is a learning mix (blended learning).

Blended learning is a learning model that combines online learning activities and classrooms, using resources optimally to improve student learning outcomes (Kaur, 2013). Fitri (2016) research, it is suggested that the application of the blended learning model can increase learning motivation and student learning outcomes at the SMK level. The blended learning model can produce student success towards increased learning achievement, and blended learning ranks first in student learning environments' effectiveness (Dziuban, Graham, Moskal, Norberg, & Sicilia, 2018). Blended learning utilizes information technology in the form of e-learning as a medium in conveying understanding and can increase student learning motivation with more modern and exciting learning (Rizkiyah, 2015). Teachers can increase student activity by providing online quizzes and online assignments with learning media-based learning management systems.

Learning management systems (LMS) is a software application for online activities so that for teaching and learning activities, it can be done online (Wibowo, Akhlis, & Nugroho, 2014). Through LMS, teachers can manage classes and exchange information with students and can access subject matter. LMS contributes in terms of utilization; teachers and students can access it anytime and anywhere and through a PC, tablet or smartphone (Alifiyanti, Afifah, & Ramadoan, 2018).

This study aims to determine the presence or absence of (1) the effect of LMS-based blended learning models on student motivation in the subject of class XI TKJ network infrastructure administration; (2) the impact of the LMS-based blended learning model on student learning outcomes in class XI TKJ network infrastructure administration subjects; (3) How effective is the application of the blended learning model to the improvement of learning motivation in the issues of class XI TKJ network infrastructure administration; (4) How effective is the application of the blended learning model to improving student learning outcomes in subjects XJ TKJ network infrastructure administration.

## 2. METHODS

This research will use quantitative research methods. Quantitative research is a strategy to solve problems in research using statistics based on data collected from research subjects (Zuldafrial, 2012: 4). The data contained in this study used a questionnaire and learning outcome test method, which was used to obtain information about the effect of LMS-based blended learning models on learning motivation and student learning outcomes in subjects in class XI TKJ network infrastructure administration at SMK Sakti Gemolong. The population in this study were students of class XI TKJ, with the number of samples used was 68 students. This study's sampling technique is to use random cluster sampling, which is a method of selection by group (Jakni, 2016: 68).

## 3. RESULT

Testing the validity of the questionnaire instruments in this study was carried out on 34 students. Of the 30 statements that passed the validity test, there were 28 valid statements and two invalid statements. The questions that are tested for reliability are valid statements, from the reliability test (Cronbach's Alfa) obtained a reliability value of 0.867 so that it can be categorized as having a very high-reliability value. While the results of testing the instrument of learning achievement tests, pretest questions that passed the validity test were 24 items out of 30 questions, and the number of posttest questions that passed the validity test was 22 items out of 30 questions. Means that removed as many as 14 questions. The reliability test results obtained pretest questions 0.897 and posttest problems obtained 0.850. Then hypothesis testing can be done. In this study, the analysis technique used is the Independent Sample t-test to test Hypothesis 1 and Hypothesis II, while the analysis technique used to determine the effectiveness of learning outcomes improvement in class XI TKJ students on the application of the blended learning model in network infrastructure administration subjects using the Test Gain. The following is Table 1. The results of the average learning motivation of students consisting of 28 statements obtained from the questionnaire pretest results before being given treatment and post-questionnaire after treatment in the form of blended learning.

Tabel 1. The average learning motivation results

<b>Data</b>	<b>Kategori</b>	<b>Rata-rata</b>
Pretest	Experimental Class	69,88
	Control Class	65,53
Posttest	Experimental Class	78,24
	Control Class	72,06

Table 1 shows the average results of the initial learning motivation (pretest) of the experimental class obtained at 69.88, and the control class pretest was obtained at 65.53. Whereas the practical class's posttest was 78.24 and the control class's posttest was 72.06. The initial learning motivation questionnaire (pretest) results were used to test the balance of the two classes using the independent sample t-test, the results of which were Sig. 0.786 > 0.05, which means far from the level of error. So it can be concluded that both classes have a balanced initial ability.

Average data from learning outcomes of students consisting of 34 students obtained from the pretest results before being given treatment and posttest after treatment is done in the form of blended learning. Can be seen in Table 2.

Tabel 2. Average results of learning outcomes

<b>Data</b>	<b>Kategori</b>	<b>Rata-rata</b>
Pretest	Experimental Class	64,29
	Control Class	66,68
Posttest	Experimental Class	82,12
	Control Class	74,03

Table 2. the average results of learning the initial ability (pretest) of the experimental class obtained at 64.29 and the pretest of the control class obtained at 66.68. As for the final ability (posttest), the experimental class received an average of 82.12, and the posttest of the control class questionnaire accepted 74.03. The results of the initial ability test (pretest) are used to test the balance of the two classes using the independent sample t-test, Sig's results. 0.510 > 0.05, which means far from the level of error. So it can be concluded that both classes have a balanced initial ability. After that, a hypothesis test is carried out with the following results:

### First Hypothesis Testing

Ho: There is no influence on student learning motivation on applying blended learning model class XI-TKJ in SMK Sakti Gemolong on Network Infrastructure Administration subjects.

Ha: There is an influence of student motivation to apply blended learning model class XI-TKJ at SMK Sakti Gemolong on Network Infrastructure Administration subjects.

Table 3. Result of the First Hypothesis Analysis

<b>Equation</b>	<b>Levene's Test</b>		<b>t-Test</b>	
<b>Variance</b>	<b>F</b>	<b>Sig.</b>	<b>t</b>	<b>Sig (2-tailed)</b>
Equal variances assumed	1.610	209	6.373	0,000
Equal variances not assumed			6.373	0,000

Table 3. The results of the first hypothesis test obtained F is equal to 1,610 with Sig. Amounted to .209, which means more significant than the level of error (0.05), there is no variance in the two classes. For the Sig (2-tailed) value in the assumed line is 0,000, which means the value is less than the error level (0.05), has a significant difference, then H<sub>0</sub> is rejected. So it can be concluded that there is an influence of the blended learning model on students' motivation in Network Infrastructure Administration class XI-TKJ in SMK Sakti Gemolong.

### Second Hypothesis Testing

H<sub>0</sub>: There is no effect of learning outcomes on the application of blended learning model class XI-TKJ in SMK Sakti Gemolong on Network Infrastructure Administration subjects.

H<sub>a</sub>: There is an effect of learning outcomes on the application of blended learning model class XI-TKJ in SMK Sakti Gemolong on Network Infrastructure Administration subjects.

Table 4. Result of the Second Hypothesis Analysis

Equation	Levene's test		t-Test	
	F	Sig.	t	1. Sig (2-tailed)
Equal variances assumed	.152	.698	4.354	0,000
Equal variances not assumed			4.354	0,000

Table 4. The first hypothesis test results, the F is equal to .152 with Sig. that is equal to .698, which means more significant than the level of error (0.05), which means that there is no variance in the two classes. For the Sig (2-tailed) value equal to 0,000, which means that the value is less than the error level (0.05), it has a significant difference, then H<sub>0</sub> is rejected. So it can be concluded that there is an influence of the blended learning model on student learning outcomes in the subjects of Network Infrastructure Administration class XI-TKJ in SMK Sakti Gemolong.

### The Effectiveness of the Blended Learning Model on Improving Student Learning Motivation

The effectiveness of the blended learning model on learning motivation is categorized using the Normalized Gain index (g), according to Hake (1999). It can be seen in Table 5—the results of the Gain Test for the two classes.

Table 5. Gain test result Data Learning motivation

Class	Average Pretest	Average Posttest	Gain Score	Note
Experimental	69,88	78,24	0,2000	Enough
Control	68,53	72,06	0,0735	Bad

Table 5. the gain test results data in the experimental class obtained a value of 0.2000 with enough categories. As for the control class, a value of 0.0735 was obtained with the less category. So, it can be concluded that the effectiveness of the blended learning model on increasing student learning motivation is higher than using conventional learning.

### The Effectiveness of the Blended Learning Model on Improving Student Learning Outcomes

The effectiveness of the blended learning model on learning outcomes is categorized using the Normalized Gain index (g), according to Hake (1999). It can be seen in Table 5—the results of the Gain Test for the two classes.

Table 6. Data Gain Test Result study

Class	Average Pretest	Average Posttest	Gain Score	Description
Experimental	64,29	82,12	0,4810	Good
Control	66,68	74,03	0,2176	Enough

Table 6. the gain test results data in the experimental class obtained a value of 0.4810 with either category. In contrast, the control class brought a value of 0.2176 with a good category. So, it can be concluded that the effectiveness of the blended learning model on improving student learning outcomes in higher than using conventional learning.

#### 4. DISCUSSION

##### **The Influence of Students Learning Motivation on the Implementation of the Blended Learning Model**

The LMS-based blended learning model can influence students' learning motivation in understanding and accepting the teacher's subject matter because students feel happy with the learning media used; they can access material that has been provided in various formats (pdf, MS Word, PowerPoint). This helps students always to get material anytime and anywhere when they want to learn, unlike the control class that only gets material when learning in class or face to face only. The influence is obtained from the results of the experimental class learning motivation questionnaire that uses blended learning and control classes using conventional learning.

The first hypothesis testing uses the t-test of the results of the posttest scores of the experimental class motivation questionnaire and the control class, which shows that there is an influence on the learning motivation of the practical class students before and after the implementation of the blended learning model. The calculation results in a value (Sig.) Of 0,000, which indicates that the value is less than 0.05. Then it can be concluded that there is an influence of a blended learning model of learning motivation on learners in subjects Network Infrastructure Administration class XI-TKJ in SMK Sakti Gemolong.

This study's results are supported by the statement of Hosam Al-Samarraie and Noria Saeed (2018) that there is a significant influence in blended learning on students' learning motivation. The study of Baiq Nila Sari Ningsih (2016) states that blended learning is better than face-to-face learning, which is associated with students' learning motivation.

##### **The Influence of Student Learning Outcomes on the Implementation of the Blended Learning Model**

The LMS-based blended learning model can influence student learning outcomes because before face-to-face learning is done, the experimental class students (XI TKJ A) can learn independently by utilizing the teacher's material uploaded online at SMK SPADA. The process helps students always to try to gain lessons by effort or self-study, unlike the control class (XI TKJ B), which only gets material when learning in class or face to face only. The influence is obtained from the experimental class learning outcomes that use blended learning and control classes using conventional learning.

The second hypothesis testing uses the t-test of the results of the posttest scores of the experimental class and the control class, which shows an influence on the learning outcomes of the experimental class students before and after using the blended learning model. The calculation results in a value (Sig.) Of 0,000, which indicates that the value is less than 0.05. Then it can be concluded that there is an influence of the blended learning model on student learning outcomes in the subjects of Network Infrastructure Administration class XI-TKJ in SMK Sakti Gemolong.

The results of this study are supported by the statement of Meng Tan, and Khe Foon Hew (2016). Blended learning models affect the learning outcomes of students compared with students taught by using conventional learning. This method is very relevant to be applied in Indonesia to support students learning independently, discuss with their peers to solve problems, encourage teachers to apply mixed learning methods, and use various learning media such as LMS (Zainuddin & Keumala, 2018).

##### **The Effectiveness of the Blended Learning Model on Learning Motivation**

With the blended learning model application to experimental class, students can hold discussions with teachers outside of class time when there is material they do not yet understand. Unlike students in the control class, when there is a material that is not understood, they can only discuss it with the teacher in the classroom. Using the help of LMS, students can also do the assignments given online and can collect assignments on time according to the agreed deadline. Learners only have to access online classes and see the tasks assigned by the teacher. So that makes them more eager to learn and can learn independently and organize their learning. This is evidenced by the results of testing

that has been done, where there are differences in the increase in learning motivation of experimental class students before and after using the blended learning model. The conclusion is reviewed from the results of the Gain test scores in both classes. It can be seen that the gain score in the experimental class obtained a value of 0.2028 with a good category. Whereas the control class gain score obtained a value of 0.735 with fewer categories. So in this study, it can be concluded that the effectiveness of the blended learning model towards increasing student learning motivation is higher than using conventional learning.

The results of this study are supported by the statement of Bibi and Jati (2015) that students' learning motivation has increased significantly due to the application of the blended learning model. Anindia's research (Rahmana & Yuliani, 2015) also stated that students tend to be more motivated to learn and seek information by using a combined learning model.

### **The Effectiveness of the Blended Learning Model on Learning Outcomes**

The application of the blended learning model is an effort to more effectively and optimize student learning activities; with blended learning, students' motivation to learn increases so that student learning outcomes also increase. Students become happy to learn and become more intense in paying attention when the learning process. This is evidenced by the results of testing that has been done, where there are differences in the improvement in learning outcomes of experimental class students before and after using the blended learning model. The conclusion is viewed from the Gain test scores in the practical class and the control class. It can be seen that the gain score in the experimental class obtained a value of 0.4810 which means the effectiveness of increasing student learning outcomes in either category. As for the gain score of the control class, a value of 0.2176 is obtained with the sufficient category. So in this study, it can be concluded that the effectiveness of the blended learning model on improving student learning outcomes is higher than using conventional learning.

The results of this study are supported by the statement of Fauziyah (2019) that blended learning is significantly more effective in improving student learning outcomes compared to conventional learning. The blended learning model can produce student success towards increased learning outcomes, and blended learning ranks first in the effectiveness of student learning environments (Dziuban et al., 2018).

## **5. CONCLUSION**

Based on the results of research and discussions that researchers have conducted, it can be concluded that the application of blended learning has effectiveness in learning because it can increase students learning motivation so that it affects learning outcomes. There are significant differences in learning motivation and learning outcomes between conventional learning and LMS-based blended learning models—increased learning motivation in the experimental class that is equal to 0.2000 and the control class 0.0735. While the increase in student learning outcomes in the experimental class is 0.4810, and the control class is 0.2176.

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