APPLICATION OF BLENDED LEARNING MODEL FLIPPED CLASSROOM IN VOCATIONAL LEARNING STRATEGY COURSES.

(The Case Study in Automotive Engineering Education Department Students during the Covid-19 Pandemic)

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Abstract. *This study aims to describe the blended learning process of the flipped classroom model, learning outcomes, and student responses. This study uses a descriptive method by taking the subject of active students of the Department of Automotive Engineering, FT UNM who are programming the vocational learning strategy courses for the 2020/2021 academic year, totalling 26 people. Observational and questionnaire-based data collection methods. The data analysis technique is in the form of descriptive statistics. The variables of this study are the blended learning model of a flipped classroom and student learning outcomes. The research instruments used were observation sheets and student response questionnaires. According to the normal curve grouping, the average value of student learning outcomes, which is transformed into the category of student learning outcomes, was 73.19, or the high category. The statistics showed that the overall success rate of learning was 92.06%, or in the high category. The student responses were in the very good category which showed an average score of 5,96. Referring to these results, it can be seen that the learning process is in the very good category.*
Keywords— Blended Learning, Flipped Classroom.

I. INTRODUCTION

The coronavirus outbreak shook the world's population from the end of 2019 until now. This virus started in Wuhan and spread all over the world. It spread very quickly and caused thousands of people to die. In January, the World Health Organization (WHO) declared the world to be in a global emergency regarding the coronavirus (cnbcindonesia.com, 2020). The disease known as Coronavirus Disease 2019 (Covid-19) is caused by a brand-new coronavirus called Sars-CoV-2, which was first detected in Wuhan, China, on December 31, 2019. (kemkes.go.id, 2020).

On March 2, 2020, the first Covid-19 case in Indonesia was confirmed, resulting in a total of two cases (Amboro, 2020: 91). To prevent its widespread in Indonesia, the government issued a policy to encourage people to practice social distancing. To stop the spread of Covid-19, policies on working from home, worshipping at home, and studying from home must be implemented. (Kompas.com, 2020). The spread of the Covid-19 pandemic throughout the world, especially in Indonesia, has had a major impact on the activities of human life. Many companies have closed and employees are working from home, including the world of education, which has also been affected. All schools and colleges were closed and the learning system was also carried out at home.

Following up on the Covid-19 pandemic, the Ministry of Education and Culture (Kemendikbud) of the Republic of Indonesia has released Circular Letter Number 4 of 2020 about the implementation of educational policies during the emergency Covid-19 pandemic era. Then, learning takes place via distance learning or online. (Kemdikbud.go.id, 2020). The Chancellor of UNM also issued a Circular to prevent its spread by implementing an online learning system using the blended learning method (unm.ac.id, 2020). *Blended learning is learning that uses face-to-face learning model syntax by integrating online applications in each model syntax used in learning. The term blended learning was originally used to describe courses*

that combine face-to-face learning with online learning.

According to Rusman (2015), the words "blended learning" and "learning" have different etymologies. Learning is what is meant by the word blend, which signifies a mixture. Thus, the term "blended learning" refers to instructional strategies that incorporate components of pattern mixing or pattern combination. Istiningsih (2015) stated that to accomplish the goals of the learning process, blended learning combines two or more methodologies and strategies. Amin (2017) Combining face-to-face instruction with ICT tools including computers (both online and offline), multimedia, virtual classrooms, the internet, and other tools is known as blended learning.

Following up on the Circular of the Minister of Education and Culture and the Chancellor of UNM regarding preventing the spread of Covid-19, the Automotive Engineering Education Department has implemented online learning using the blended learning method during the pandemic.

Learning is carried out in a blinded manner with the flipped classroom model. Learning during this pandemic combines synchronous learning and asynchronous learning. Muhtadi (2019) stated that there are many models that educators can use to apply blended learning activities. The Clayton Christinsen Institute has identified several models that are used quite frequently. Some of these blended learning models can be illustrated in the image below.

Illustration of Blended Learning Model (Muhtadi, 2019). Muhtadi (2019) The cycle that often occurs is reversed by the flipped classroom learning approach. Before students start class, they will receive live teaching via online video. So that when class starts, students can start working on and completing their assignments and can ask for help through discussion activities in class.

Moving on from this reality, the author was compelled to conduct research on Automotive Engineering department students during the Covid-19 pandemic. the results of this study to improve learning outcomes in Automotive Engineering Education Department Students during the Covid-19 Pandemic

II. RESEARCH METHODS

This study is a descriptive research. This study was located at the Department of Automotive Engineering Education, Faculty of Engineering, Makassar State University, Jalan Daeng Tata Raya Parangtambung, Makassar. This study was conducted in the odd semester of the 2020/2021 academic year. The population in this study were students of the Automotive Engineering Education Department from 2014 to 2018 who had or were programming vocational learning strategy courses and the sample of this study was 2018 students who were programming vocational learning strategy courses. The variables of this research are the blended learning model of flipped classrooms and student learning outcomes.

Data collection techniques in this study include, (1) observing the implementation of learning during the learning process to obtain data regarding the implementation of learning using the blended learning model of the flipped classroom, (2) Questionnaire student responses after all teaching and learning activities have been completed to obtain data regarding responses. students on the application of blended learning model flipped classroom in vocational learning strategy courses,

The research instruments used were observation sheets and student response questionnaires. The observation sheet consists of perceiving the teaching and learning process, organizing the teaching and learning process, and evaluating the teaching and learning process. The student response questionnaire consisted of interest, learning awareness, and motivation. Data analysis in this study was used to describe the teaching and learning process, learning outcomes, and student responses after participating in the teaching and learning process. This analysis includes mean, median, mode, maximum value, minimum value, and frequency distribution table.

III. RESEARCH RESULT

A. Learning process

The learning process in this study was carried out nine times with details six times through google classroom and three times via google meet. The results of the learning process in this study are data on the implementation of the learning process. This data was obtained from filling in the observation sheet of the observer during the lesson.

After processing the data using SPSS, the statistics of the learning process were obtained with a mean value of 12.89; median value 13; mode value 14; standard deviation value is 1.167; minimum value 11; and the maximum value is 14. The statistical table for data processing uses SPSS as follows.

TABLE 1
Data processing statistics

Statistics				
		Learning process	Results	Student Response
N	Valid	9	26	26
	Missing	0	0	0
Mean		12.89	73.942	5.96
Median		13.00	70.000	6.00
Mode		14	65.0	7
Std. Deviation		1.167	110.719	1.216
Minimum		11	62.5	3
Maximum		14	95.0	7

TABLE 2
Learning process

Learning process					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	11	1	11.1	11.1	11.1
	12	3	33.3	33.3	44.4
	13	1	11.1	11.1	55.6
	14	4	44.4	44.4	100.0
	Total	9	100.0	100.0	

The implementation of activities in each online learning through Google Classroom is 100% successively; 85.71%; 100%; 78.57%; 92.85%; and 85.71%. This percentage indicates that the asynchronous learning process is in the very high, high, very high, high, high, and high categories. The implementation of activities in each synchronous learning using virtual face-to-face through google meet in a row is 100%; 100%; and 85.7%. This percentage indicates that the virtual face-to-face learning process is in the very high, very high, and high categories, respectively. The learning process category table 3.

TABLE 3
Category of the learning process

Meeting	Type of Learning	The number of arning activitie carried out	Number of Learning Activities observed	Percentage of Execution
1	*Classroom*	14	14	100%
2	*Classroom*	12	14	85,71%
3	*Classroom*	14	14	100%
4	*Classroom*	11	14	78,57%
5	*Classroom*	13	14	92,85%
6	*Classroom*	12	14	85,71%
7	Online	14	14	100%
8	Online	14	14	100%
9	Online	12	14	85,71%
Total		116	126	92,06%

Based on the results of the analysis, the overall implementation of learning activities is 92.06%. From this percentage and by referring to the normal curve grouping, it can be seen that the learning process is in the high category.

B. Learning outcomes

Data on student learning outcomes were obtained from lecturers who were effective in the vocational learning strategy course after carrying out the mid-semester exam. These findings represent an evaluation of learning as a whole as it relates to blended learning and the flipped classroom approach. The number of students in this course program is 26 people.

After processing the data using SPSS, the statistical learning outcomes were obtained with a mean value of 73,942; median value 70; mode value 65; the standard deviation value is 110.719; minimum score 62.5; and a maximum value is 95. The statistical table for data processing uses SPSS as follows.

TABLE 4
Statistics

Statistics				
		Learning process	Learning outcomes	Student Response
N	Valid	9	26	26
	Missing	0	0	0
Mean		12.89	73.942	5.96
Median		13.00	70.000	6.00
Mode		14	65.0	7
Std. Deviation		1.167	110.719	1.216
Minimum		11	62.5	3
Maximum		14	95.0	7

TABLE 5
Learning outcomes

Learning outcomes					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	62.5	5	19.2	19.2	19.2
	65.0	7	26.9	26.9	46.2
	70.0	2	7.7	7.7	53.8
	75.0	2	7.7	7.7	61.5
	77.5	1	3.8	3.8	65.4
	82.5	2	7.7	7.7	73.1
	85.0	2	7.7	7.7	80.8

	87.5	2	7.7	7.7	88.5
	90.0	1	3.8	3.8	92.3
	92.5	1	3.8	3.8	96.2
	95.0	1	3.8	3.8	100.0
	Total	26	100.0	100.0	

Learning outcomes identify students who got an index of C value, which is the score between 61 and 65, where frequency is 12 and percentage is 46.15%; an index of C+ in the range of 66 to 70 where frequency is 2 and percentage is 7.6%; an index of B- in the range of 71 to 75 where frequency is 2 and percentage is 3.84%; an index of B in the range of 76 to 80 where frequency is 1 and percentage is 3.84%; and an index of B+ in the range of the following is a distribution table of the learning outcomes.

TABLE 6
Distribution of learning outcomes

Index	Score	Xi	Fi	Fi xi	Percentage	Category
A	91-100	95,5	2	191	7,6%	Pass
A-	86-90	88	3	264	11,53%	Pass
B+	81-85	83	4	332	15,38%	Pass
B	76-80	78	1	78	3,84%	Pass
B-	71-75	73	2	146	7,6%	Pass
C+	66-70	68	2	136	7,6%	Pass
C	61-65	63	12	756	46,15%	Pass
C-	56-60	0	0	0	0%	not pass
D+	51-55	0	0	0	0%	not pass
D	46-50	0	0	0	0%	not pass
D-	41-45	0	0	0	0%	not pass
E	0-40	0	0	0	0%	not pass
JUMLAH			26	1.903	100%	

The analysis's findings indicate that the average value of student learning outcomes is 73.19. It is clear from these data and the normal curve grouping that the learning outcomes are into the high category.

C. Student Response

Data from student responses to a questionnaire were collected from the 26 students that comprised the study's sample. After processing the data using SPSS, the statistical responses of students were obtained with a mean value of 5.96; median value 6; mode value 7; the standard deviation of 1.216; minimum value 3; and a maximum value of 7. The statistical table for data processing using SPSS is as follows.

TABLE 7
Statistics

Statistics				
		Learning process	Learning outcomes	Student Response
N	Valid	9	26	26
	Missing	0	0	0
Mean		12.89	73.942	5.96
Median		13.00	70.000	6.00
Mode		14	65.0	7
Std. Deviation		1.167	110.719	1.216
Minimum		11	62.5	3
Maximum		14	95.0	7

TABLE 8
Student response

Student response					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	2	7.7	7.7	7.7
	4	1	3.8	3.8	11.5
	5	4	15.4	15.4	26.9
	6	8	30.8	30.8	57.7
	7	11	42.3	42.3	100.0
	Total	26	100.0	100.0	

The results of the questionnaire showed students' responses to answer yes to statement number 1 as many as 24 (92.30%) number 2 as much as 22 (84.61%), number 3 as many as 21 (80.76%), number 4 as many as 19 (73.07%), number 5 is 24 (92.30%), number 6 is 23 (88.64%), and number 7 is 22 (84.61%). The distribution table of student responses is as follows.

TABLE 9
Distribution of student responses

No	Statement	Yes	No
1.	The application of blended learning in learning strategy courses is an interesting thing for me.	92,30 %	7,69%
2.	With the application of blended learning, it is easier for me to understand the subject matter of vocational learning strategies.	84,61 %	15,38 %
3.	With the application of blended learning, the time I spend in learning vocational learning strategies becomes more and is not limited to learning time in class.	80,76 %	19,23 %
4.	With the application of blended learning, I can learn vocational learning strategies	73,07 %	26,92 %

	by adjusting my learning speed.		
5.	With the application of blended learning, I am motivated to learn vocational learning strategies.	92,30 %	7,69%
6.	The application of blended learning is useful for me in learning vocational learning strategies.	88,46 %	11,53 %
7.	I agree if blended learning is applied in the PTO Department of FT UNM.	84,61 %	15,38 %

Based on the results of the analysis, the average value of student responses was 5.96. From these results and by referring to the normal curve grouping, it can be seen that students' responses to the blended learning model of the flipped classroom are in the very good category.

IV. DISCUSSIONS

A. *Learning process*

Referring to the results of the analysis of the learning process in the appendix, the percentage of the implementation of the planned learning process, both for each meeting and the overall implementation of the blended learning model of the flipped classroom, is obtained. The implementation of activities in each online learning through Google Classroom in a row is 100%; 85.71%; 100%; 78.57%; 92.85%; and 85.71%. This percentage indicates that the asynchronous learning process is in the very high, high, very high, high, high, and high categories. The implementation of activities in each synchronous learning using of virtual face-to-face through google meet in a row is 100%; 100%; and 85.7%. This percentage indicates that the virtual face-to-face learning process is in the very high, very high, and high categories, respectively.

The percentage of implementing asynchronous learning through Google Classroom is higher than synchronous learning by virtual face-to-face through Google Meet, it can be inferred from the overall percentage of asynchronous learning through Google Classroom and synchronous virtual face-to-face through Google Meet. Each plan for implementing learning through Google Classroom or face-to-face through Google Meet is made to include a learning process that involves interaction between lecturers and students.

Based on the results of the analysis, the overall implementation of learning activities is 92.06%. From this percentage and by referring to the normal curve grouping, it can be seen that the blended learning process with the flipped classroom model assisted by google classroom and google meet in the vocational learning strategy course at the Department of Automotive Engineering, FT UNM in the odd semester 2020/2021 is in the high category.

B. *Learning outcomes*

Referring to the results of data analysis on student learning outcomes, the average learning outcomes that can be achieved by students after participating in learning with the blended learning model of the flipped classroom at the Department of Automotive Engineering, FT UNM for the 2020/2021 academic year in the vocational learning strategy course, shows the number 73.19. The learning process is in the high category when this figure is interpreted into the category of student learning outcomes using the normal curve grouping.

C. *Student Response*

Based on the results of the questionnaire data analysis of student responses to the application of the blended learning model of the flipped classroom, it can be seen that the percentage of student responses to the application of blended learning shows an average value of 5.96. Referring to the normal curve grouping, it can be seen that the learning process is in the very good category. Everyone who participates in studying the blended learning model of the flipped classroom with the assistance of Google Classroom and Google Meet will have an impression of what he has encountered. Blended learning is a new methodology in learning in the 21st century, which combines synchronous and asynchronous learning.

V. CONCLUSIONS

The conclusions of this study are as follows.

- The learning process uses the blended learning model of the flipped classroom in the Department of Automotive Engineering, FT UNM for the 2020/2021 academic year in the vocational learning strategy course, which is in the high category with a figure of 92.06%.
- Student learning outcomes after applying the flipped classroom blended learning model in the Automotive Engineering Education Department, FT UNM for the 2020/2021

academic year in the vocational learning strategy course, are in the high category with an average score of 73.19.

- Student responses to the application of the flipped classroom blended learning model in the Automotive Engineering Education Department, FT UNM for the 2020/2021 academic year in the vocational learning strategy course, are in the very good category with an average score of 5.96.

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