

Implementation Of Blended Learning During Covid-19 Pandemic On Learning Interests And Outcomes

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Abstract

This research aims to determine the effect of *blended learning* on students' learning interests and outcomes in musculoskeletal system subjects. The research benefit proved that blended learning could be a practical alternative learning approach during the pandemic. This research was carried out in October 2021. The research design was experimental and used a quantitative approach through *pre-tests* and *post-tests*. Sampling data collection employed *cluster random sampling* technique. The research sample consisted of 21 students from the experimental group and 21 students from the control class. The control class was given a *full online* learning treatment, and the experimental class was given a *blended learning* treatment. A hypothesis testing data analysis was performed using the ANCOVA test. Then, online learning was conducted over four meetings and offline learning was conducted in one meeting. The average learning interest in the experimental class was 124.3, and the control class was 117.62, which was categorized as *sufficient*. The average percentage increase in learning outcome scores in the experimental class was 70.57%, while it was only 60.48% in the control class. Data processing outcomes on learning interest obtained a value of 0.009 with $\alpha = 0.05$. Meanwhile, values processed on learning outcomes obtained a value of 0.02 with $\alpha = 0.05$. The increase in students' interest and learning outcomes was caused by varied learning styles using the *blended learning* approach. Hence, based on these data, *blended learning* significantly affected students' learning interests and outcomes.

Keywords: Blended learning; Student Learning Outcomes; Students' Learning Interest.

1. Introduction

The 2019 Novel Coronavirus (2019-nCov) outbreak, which continues to spread, has caused the COVID-19 pandemic worldwide and resulted in a health crisis occurring in the current millennium era. The Covid-19 case began in Wuhan, China. Then, on February 11, 2020, the disease caused by SARS-Co-2 was called *Coronavirus disease 2019* by WHO. It was not the first pandemic experienced by the world. A similar pandemic also occurred in 1918, i.e., *Spanish Flu*.

Health experts predicted this pandemic would not end for two or three years. Hence, it triggered panic in the United Nations (UN) organization. The largest international organization realized that the education sector was one of the critical sectors that was severely affected during this pandemic. UNESCO states that there are approximately 290.5 million students worldwide whose learning activities have been disrupted.

The government and the Minister of Education jointly issued a policy written in Circular Letter Number 4 of 2020 concerning learning from home using an online system as an effort to break the chain of COVID-19 spread. The prohibition of *face-to-face* learning was expected to minimize the spread of the Covid-19 pandemic. This policy has also been

implemented by other countries affected by the COVID-19 pandemic to limit community interaction, which was believed to be the chain of *coronavirus* spread.

Online learning, which was carried out simultaneously in Indonesia, caused various challenges and difficulties for teachers and students. All levels of educational institutions in Indonesia, from primary education to tertiary education, whether under the auspices of the Indonesian Ministry of Education and Culture or the Indonesian Ministry of Religion, experienced the negative impacts of online learning. In fact, students have not been fully accustomed to carrying out learning activities entirely online. Some teaching staff still arduously adapted to teaching with internet technology learning media, especially teaching staff in rural areas.

The learning activities primarily aim to create a fun and attractive learning atmosphere, attracting students' interest and enthusiasm. Education creates a learning atmosphere and learning process; thus, students actively develop their potential. However, during the online learning period, this objective was disrupted. The students' low interest was caused by a lack of understanding of the material and facilities for participating in learning activities, such as internet accessibility and quotas. Therefore, students could not attend learning activities and submit assignments given by the teacher. Moreover, it also affected student learning outcomes which tended to decline.

In this case, teachers and schools during the pandemic are required to be well-prepared to teach online with competency, fast, and precise requirements. Conventional *face-to-face* (offline) learning was a familiar and comfortable learning style for Indonesian students. During the pandemic, the online learning process must be implemented forcefully. Inevitably, whether people are ready or not, the demand for online learning must be implemented. Thus, teachers, as educators, must design good plans in the learning process, i.e., when determining appropriate and effective learning strategies, especially during this pandemic.

Blended learning is a learning approach that combines *face-to-face* learning activities with online/networked learning. Elizabeth's research revealed that the effectiveness of blended learning for English language learners resulted in a high percentage of scores at the reading level. The increasing interest in reading indicated that blended learning could be used as a viable option to increase students' interest in reading. Other research also stated that the learning process with blended learning was in the excellence category, and student learning outcomes were in the sufficient category.

In addition, *blended learning* is a learning process that combines conventional (face-to-face) and online (distance) learning styles. This learning aims to determine a harmonious balance by offering an effective and efficient learning process, using online learning (internet) with direct face-to-face interaction. Blended learning is online-based learning that combines classroom learning. Nowadays, the blended learning approach is an alternative learning strategy that can be employed by teachers; *blended learning* can be done anytime and anywhere, at the same time, and in different places. Hence, this strengthens learning in the classroom by utilizing current learning technology.

Due to *full online learning* problems, the teacher's task became more challenging in monitoring students remotely, and students also arduously understand and carry out the lessons given. Therefore, these obstacles could be overcome by combining the blended learning model with face-to-face learning in the classroom. The blended learning strategy was one strategy that could be used; thus, students could understand learning optimally

during the current pandemic. The blended learning approach combines conventional face-to-face learning and distance learning using the internet (online).

2. Material and Method

This research employed a quasi-experimental research design with a *pretest-posttest* control class. The research sample was class VIII, totaling 42 people (21 people in the experimental class and 21 people in the control samples), located at MTs. (Islamic Junior High School) Nahdlatul Mujahideen. The research instrument used test questions and twin questionnaires. The questions were arranged in multiple choice form and filled in related to musculoskeletal system material. Tests and questionnaires were given to students in the experimental and control classes before (*pre-test*) and after (*post-test*) the treatment. This technique aimed to obtain data on students' interests and learning outcomes. The research was carried out by providing treatment to the experimental class using blended learning, while the control class was given full online learning. Hypothesis testing data analysis employed the ANCOVA formula with a significance level of $\alpha = 0.05$ to measure the effect of blended learning on interest variables and learning outcomes.

3. Results and Discussion

a. Learning Implementation

Before the *blended learning* was implemented, guidance on the *Zoom* application feature was already provided. Students downloaded the *Zoom* application and then joined the learning process using the ID and password that had been prepared. In this stage, the teacher also conveyed the learning objectives and provided explanations and examples of learning material taken from daily life. The learning process was conducted over five meetings, with details of four online learning sessions and one offline session, to evaluate students' understanding of the experimental class. There were five online meetings in the control class. The detailed learning schedule can be seen in Table 1.

Group	Activity	Time Allocation	Day/ Date
1	2	4	4
Control (<i>full online</i>)	<i>Pre-test</i> and fill out the interest questionnaire	2 x 35 minutes	Friday, September 24, 2021
	Learning I	2 x 35 minutes	Saturday, September 26, 2021
	Learning II	2 x 35 minutes	Tuesday, September 28, 2021
	Learning III	2 x 35 minutes	Thursday, September 30, 2021
	Learning IV	2 x 35 minutes	Saturday, October 2, 2021
	Learning V	2 x 35 minutes	Tuesday, October 5, 2021

Experimental (blended learning)	Post-test and fill out the interest questionnaire	2 x 35 minutes	Wednesday, October 6, 2021
	Pre-test and fill out the interest questionnaire	2 x 35 minutes	Friday, September 24, 2021
	Learning I (online)	2 x 35 minutes	Saturday, September 26, 2021
	Learning II (online)	2 x 35 minutes	Tuesday, September 28, 2021
	Learning III (online)	2 x 35 minutes	Thursday, September 30, 2021
	Learning IV (online)	2 x 35 minutes	Saturday, October 2, 2021
	Learning V (offline)	2 x 35 minutes	Tuesday, October 5, 2021
	Post-test and fill out the interest questionnaire (offline)	2 x 35 minutes	Wednesday, October 6, 2021

1) Learning Process in Control Class (*Full Online*)

Notably, before learning began at this stage, students promptly filled out the attendance list prepared by the teacher on the *Google Form* link. The teacher provided apperception to students by giving motivational sentences and examples of several benefits of the human musculoskeletal system. To determine the extent of students' initial knowledge about the material to be taught, namely musculoskeletal system material, the teacher gave *pre-test* questions and then conveyed the learning objectives. The teacher then provided treatment by explaining and delivering concrete learning material using *PowerPoints* that had been prepared entirely online using the *Zoom* meeting platform. Students listened to the explanation given by the teacher and wrote down important points in their respective notebooks. In addition, the teacher provided example questions and held questions and answers to students about the material that had just been taught. After the teacher explained the material, students held discussions by asking and responding to each other's questions. The teacher carried out five meetings, with details of one meeting completing two learning objectives. The learning material carried out at meetings I and V, respectively, included the function of the skeletal system and the types of bones that made up the skeletal system, types of bones based on their shape and properties, the concept of rectilinear motion based on reference points, distance, and displacement, and the concept of rectilinear motion and distance and displacement.

The student learning process through *home learning* and *full online* assignments ran smoothly during five meetings. At the last meeting, the teacher gave a *post-test* to be done by each student at the end of the lesson.

2) Learning Process in Experimental Class (*Blended Learning*)

The experimental class learning process at meetings I to IV was carried out online with detailed structured learning stages. In the initial lesson, the teacher provided a general overview of how to learn using the blended learning method. The teacher guided the students to open the Zoom platform using the ID and shared password. Then, they followed the learning process for 40 minutes. In the first stage, the teacher fostered positive attitudes towards learning and then oriented students by reminding them to fill in the attendance list prepared by the teacher on the *Google Form* link on time. Students entered the meeting room, and the learning process began at the same time as the teacher provided motivation to the students and conveyed the learning objectives. The teacher explained the learning material concretely using prepared *PowerPoints*. At the end of the material explanation session, the teacher allowed students to ask questions. The teacher then coordinated with students to carry out discussions by asking and responding to each other's questions and the questions given by their classmates. The learning process was carried out in five meetings, with detailed material successively including the function of the skeletal system and the types of bones that made up the skeletal system, bones' types based on their shape and properties, the concept of rectilinear motion based on reference points, distance, and displacement, and the concept of rectilinear motion, distance, and displacement.

b. Learning Outcomes

Data on student learning outcomes in the experimental and control classes before and after learning are shown in Table 2.

Table 2. Pretest-Posttest Data for Control and Experimental Classes

Description	Pretest		Posttest	
	Control Score	Experimental Score	Control Score	Experimental Score
Minimum Score	46	54	68	73
Maximum Score	78	81	88	90
Range	32	27	20	17
Mean	63.381	67.333	77.333	81.048
Variance	59.748	54.233	24.533	26.648
Standard Deviation	7.7297	7.3643	4.9531	5.1621

Data processing on student learning outcomes in the experimental and control classes experienced an increase after being treated with blended learning.

The increase in student learning outcomes in the experimental class could be seen from the average *pre-test* score of 67.333, increasing to 81.048, with a corrected average percentage increase of 70.57% *post-treatment* using blended learning. The increase in learning outcomes also occurred in the control class, indicated by the average *pre-test* score of 63.381, which increased to 77.333, with a corrected average percentage increase of 60.48% after the learning process was carried out. The difference in the average increase in *pre-test* and *post-test* in the experimental class was 13.71%. The increase in student learning outcomes in the experimental and control classes can be seen in the bar chart of average scores in Figure 1.

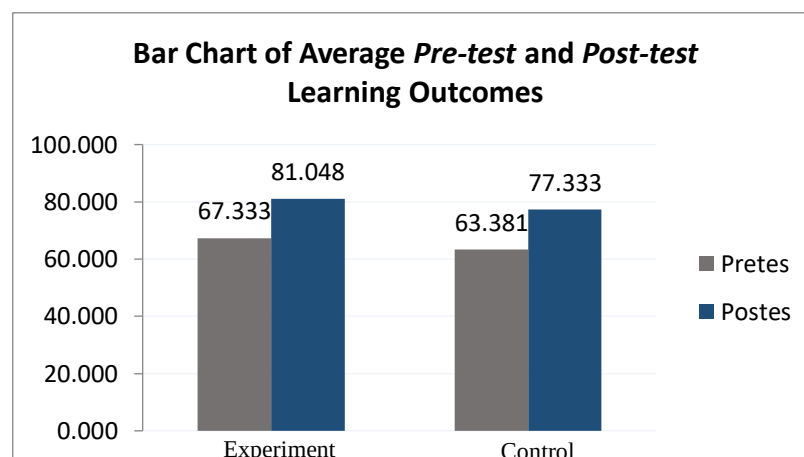


Figure 1. Average *Pre-test* and *Post-test* Scores for Control and Experiment Class Learning Outcomes

Based on the learning outcomes data obtained, the average scores for the control and experimental classes before being given treatment were 63.381 and 67.333. This value implied that students' understanding of the learning material was still lacking. After being given treatment in the experimental class using blended learning and the control class using full online, student learning outcomes increased with an average score of 77.333 and 81.048 in the control class and experimental class. The difference in scores indicated that the understanding of students who used blended learning has increased.

c. Students' Interest

Students' interest data from the experimental and control classes pre- and post-treatments can be seen in Table 3.

Table 3. Interest Score Data on *Pre*-and *Post*-treatments

Description	Experimental Score		Control Score	
	Pre	Post	Pre	Post
Number of Respondents	21	21	21	21
Maximum Score	144	139	138	134
Minimum Score	104	112	101	103
Range	40	27	37	31
Mean	121	124.3	122	117.62
Variance	132.5286	53.53333	97.05714	73.64762
Standard Deviation	11.51211	7.316648	9.851758	8.581819

Based on Table 3, the average learning interest score in the experimental class *post-treatment* was 124.3. Meanwhile, the interest score in the control class *post-treatment* was 117.62. After conducting an analysis test, the average in the two classes was categorized as *sufficient*.

Discussion

Measurement of students' interest and learning outcomes was obtained by providing *pre-test* and *post-test* questions before and after *blended learning* was implemented. The answering time was 40 minutes, consisting of 10 multiple-choice items and five descriptions. The students' *pre-test* results showed that there was an insignificant difference in scores between the control class and the experimental class. There was no difference because the two classes had not received learning materials; thus, the students' *pre-test* results were low. Meanwhile, students' *post-test* results indicated a significant difference between the control class and the experimental class. These differences showed that this *blended learning* had a significant effect on student learning outcomes in musculoskeletal system material.

The increase in student learning outcomes in the experimental class was caused by the teacher's teaching style, which was felt to be new for the students. The learning process using the Zoom application was the first time for students, causing students to be interested in learning and pay close attention to the teacher's explanations.

Through *blended learning*, students can learn remotely or *face-to-face* in a classroom. The learning process could also take place at any time without time limitations, i.e., students could carry out the learning process according to their wishes. Students with a lack of understanding of the learning material could re-study the material that the teacher shared by opening the material file provided on the learning platform. In addition, a *face-to-face* evaluation of learning materials was carried out; hence, students could think concretely and easily about studying the material and answering questions.

Furthermore, the *blended learning* in online and offline sessions was carried out at live events. In blended learning, students can learn independently but the teacher can still monitor students' understanding. Students who were reluctant to ask questions or were embarrassed during *face-to-face* learning would not experience difficulties because, in the online learning process, students could ask questions via the chat room in the Zoom application. The effect of *blended learning* had a positive impact on student learning

outcomes; thus, there was an increase in the average student learning outcomes. The increase in average learning outcomes was also proven by Apriliya's research, which showed that blended learning could increase average grades.

The learning outcomes were less than optimal in the control class, which was carried out entirely online. It was because *full online* learning had several disadvantages; students tended to be passive, teachers found it challenging to know students' level of understanding, learning material was often completed in one meeting, and if the teacher did not have good communication skills, then students would feel bored.

These obstacles obstructed the students from understanding the lessons being taught; thus, students found it challenging to get good grades in the science learning process, especially in abstract concepts. The *full online* learning method applied in the control class made students to be passive and less optimal in engagement. Student engagement was limited to listening and noting the concepts given.

Hence, the description above implied that different treatments caused different final results between the experimental class, which used *blended learning*, and the control class, which used full online learning methods. Moreover, it confirmed that *blended learning* could improve student learning outcomes, as contained in the students' final results (*post-test*) in the experimental class, which were higher than those in the control class, which was taught using the *full online* learning method.

Furthermore, *blended learning* could increase the average student learning because the collaborative learning process between online and offline complemented each other's weaknesses. Time limitations during offline learning could be improved, and the lack of teacher supervision and control over student understanding in online learning could be enhanced during offline learning sessions. It caused blended learning to be used more effectively during the pandemic to increase students' interest and learning outcomes.

Hypothesis test outcomes used the ANCOVA test with $\alpha = 0.05$. The data-processed results on student learning outcomes were 0.02 from the significance level of 0.05. Thus, it emphasized that *blended learning* significantly affected student learning outcomes. These results could be strengthened by Ulya Mahfuza's research, which revealed that blended learning was more effective than *face-to-face* or online learning systems.

Interest is a feeling of preference and curiosity about something or an activity without anyone telling you to. Interest is the acceptance of a relationship between oneself and something outside oneself. The stronger or closer the relationship, the greater the interest generated. Learning interest activities significantly affect students' understanding and learning outcomes. Increasing students' learning interests greatly affects student learning outcomes. Indicators of students' learning interest can be seen in students' feelings of joy, interest, attention, and involvement. Measuring students' feelings can be seen from learning without force, liking their learning, and feeling at home with learning activities. Interest indicators can be seen in students' enthusiasm for learning and interest in working on questions. Attention indicators can be seen from students observing the teacher's explanation during learning, observing friends' explanations, and following the teacher's instructions. Engagement indicators can be seen in students responding to questions, asking if there is material they do not understand, and answering questions the teacher gives.

Students' responses to blended learning at meetings 1, 2, and 3 were enthusiastic. This indicator emerged because students never experienced *blended learning*, especially with Zoom meeting media. When the lesson started, the students were inquisitive and

needed enough time to guide them into the Zoom room. At the fourth meeting, students showed activities that indicated a stable learning interest. Students' enthusiasm for participating in learning using Zoom meetings showed that there was interest during the learning process. In the experimental class, students actively asked about material they did not understand and responded to the teacher's explanation.

The interest test results before and after learning reported that students' interest has increased from the experimental and control classes. Previously, students' learning process only relied on WhatsApp groups and independent study *post*-assignments by the teacher. These learning activities were carried out during the pandemic, which caused students to become bored because direct interaction between teachers and students was reduced. Therefore, learning using blended learning could increase students' interest, which is characterized by the attitude of the students who are enthusiastic and interested in learning.

The results of hypothesis testing on students' interest in using blended learning were 0.009 with a significance level of $\alpha = 0.05$. It indicated that *blended learning* significantly affected students' learning interests. Therefore, blended learning can increase students' interest in learning during the Covid-19 pandemic. The learning variations in blended learning were able to attract students' enthusiastic attitudes to participating in online learning at home using the Zoom meeting application. The online learning process using Zoom and offline evaluation caused students to understand the learning material better because they could interact directly with the subject teacher.

Conclusion

In short, the research regarding the effect of blended learning during the pandemic on students' interest and learning outcomes concluded:

1. The implementation of blended learning significantly affected students' learning interests. With a significance level of $\alpha = 0.05$, H_a was accepted, and H_0 was rejected.
2. The implementation of blended learning also significantly affected student learning outcomes. With a significance level of $\alpha = 0.05$, H_a was accepted, and H_0 was rejected.

This research conducted offline meetings for one meeting. It was still less optimal to implement blended learning. Therefore, it is recommended that further studies be carried out on student learning outcomes by maximizing offline meetings in subsequent learning.

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