

The Effect of Blended Learning on Student Learning Outcomes and Interest in Class 5 Ecosystems

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Abstract: Blended Learning is a combination of offline and online learning methods that allows the learning process to run optimally because the advantages of the two methods will be able to complement each other. The purpose of this study was to analyze the effect of blended learning on learning outcomes, to analyze the effect of blended learning on learning interest, to analyze how much influence blended learning has on learning outcomes in Harmony in the Ecosystem of class 5, Sale District, Rembang Regency. This research is a quantitative research design by experimental research types. The population in this study were all 5th grade students in the Sale district. The research was conducted at SD 1 Negeri Mrayun as the control class and SD Negeri 2 Wonokerto as the experimental class as the sample. This research was carried out in 3 stages, namely, preparation, implementation, processing and data analysis. Sources of research data come from questionnaires and tests. Data analysis in this study used the mean difference test and N Gain with a significance level test of 0.05 using SPSS. From the research, it was found that there was a positive and significant relationship in the use of the blended learning model on student learning outcomes. There is a positive and significant relationship in the use of blended learning on students' learning interest. There is a significant increase in student learning outcomes with a large increase in the N Gain value of 33.37.

Keywords: Blended Learning, Learning Outcomes, Learning Interest.

1. Introduction

Good quality education is needed to facilitate and help create smart people and be able to compete in the era of globalization (Setiadi et al., 2016). Education has a very large role in shaping character, developing potential in the field of science and mentality of a child, who will later grow into an adult who will interact and do many things with his environment, both individually and as a social being.

Teachers are educators and instructors who play a very important role in the education process (Setiadi, 2021). Teachers must be role models in the school environment, society and even the nation and state. Therefore, the teacher must meet several criteria such as being responsible, disciplined, authoritative, helpful and so on. In fact, the number of teachers in schools is still not sufficient so that learning is still not optimal because they teach in two classes at once. Learning is carried out spontaneously and lacks preparation if it continues to occur.

Meeting the needs of teachers is a complex joint problem because it involves individuals, institutions and government agencies. The lack of teachers can affect the delivery of learning and the mastery of the subject matter (Khamdun et al., 2021). Another thing that was found in the field was the inappropriate teacher workload (Arifin, 2022). Many additional tasks are assigned to teachers, especially in elementary schools which do not have special administrative staff. Teachers in elementary schools are burdened with being school operators, treasurers of School Operational Costs (BOS), inventory officers of goods and buildings and librarians. The large number of tasks that must be done makes the teacher overwhelmed in completing the learning material that must be delivered so that students must be given a lot of homework.

The beginning of learning usually occurs in July in each new school year. Effective days are calculated in detail but in August in elementary schools there are often annual agendas such as hiking, scouting day commemorations and camping activities as well as carnivals and competitions to commemorate the Republic of Indonesia's Anniversary. The role of science and technology (IPTEK) in the world of education is something that is considered important in this 21st

century education (Astuti et al., 2021). Learning activities that were previously carried out face-to-face at school have changed to virtual learning from home using applications such as *Google Meet*, *Google Classroom*, *WhatsApp* and *Microsoft Teams* (Mendikbud Circular Letter Number 4 of 2020). The application has features such as discussion forums, curriculum, learning resources, quizzes, assignments, questionnaires, academic information, and student data management, so that these features can make it easier for educators and students in the learning process (Biantoro, 2022). This requires school principals and educators in schools to carry out learning innovation methods. To overcome this problem, it is necessary to have a learning method that is able to improve learning outcomes and students' interests as well as theoretical understanding. This learning method is a method based on interaction between educators and students, namely by using the blended learning method.

Blended learning is a combination of face-to-face learning in class and online learning in enhancing active learning by minimizing face-to-face learning in class. According to (Firdaus, 2020) stated that blended learning is a learning that mixes various strategies that provide, learning models, and various technological media. Students are will be able to understand learning well and be active.

So, the Blended Learning learning model is a learning model that combines and online and offline through e learning to become a medium that has an great role in the learning process. (Permana et al., 2021) Through the nature of Blended Learning learning which is more flexible than conventional or face-to-face learning, students can learn according to their own pace of understanding and can stimulate the activeness of students get more involved in the learning process with the availability of various facilities in accessing material and learning activities.

Through the Blended Learning learning system, students and educators are required to get more pro-active in learning the course in the class. Educators must be more creative in making and delivering material, namely by providing stimuli that provoke students to communicate actively during the learning process. Then from the student side, will be able to faster for responsibility in a competitive atmosphere through the interactions that are presented during the learning process with the Blended Learning system (Syafitri et al., 2022).

The blended learning system has been used in all subjects. This also happens to Material Harmony in Ecosystems. So far, the learning process for Harmony in Ecosystems in Class 5 is still carried out conventionally. Educators have not carried out active and creative learning. In the process of learning Harmony in the Ecosystem, it is often found that teacher-centered learning is so that the implication of students during the learning process is still lacking. Understanding of the subject matter is great to realize the stride of students in learning, especially the understanding of Harmony in Ecosystems.

Based on the above, professional educators are needed who are able to get over the problems that appear in the learning process. For example, students wait more for educators to present than seek and find knowledge on their own and there is no involvement of learning practices in the learning process, learning becomes monotonous so that students do not interact and work together in solving problems.

In the future, to ensure the readiness of students will be able to see from the interest in learning the students themselves. With an interest in students in learning a lesson will help these students to achieve success in learning. The success achieved is not only in the form of grades or achievements but also changes in behavior in these students. If students are interested in Harmony in Ecosystems material, they have been diligent and happy to study it, which in the end will satisfy their achievements, not only that, but also experience from the content. Actually, in reality prove that students have low learning interest, they are consider learning activities to be unpleasant, they prefer to do activities outside such as hanging out and playing with peers.

As well as learning outcomes, which can have a huge impact on determining the level of student comprehension. If the learning outcomes of students are above the average value, then it can be said that students understand the Harmony in Ecosystem material. Vice versa, if students find scores below the average, it can be said that students do not understand Harmony in Ecosystems material. According to Rusmono (2017) learning outcomes are changes in the behavior of individual students which include several domains, namely the psychomotor, affective and cognitive domains. Learning outcomes greatly determine students' understanding during learning and learning outcomes also determine whether or not learning objectives are achieved.

Several research have conducted this study. One of them Fatimah et al., (2021) conducted a study, and the result show that there is an influence on students' learning interest by applying the blended learning learning model. Hypothesis test result gleaned a significant value. (2-tailed) of $0.000 <$ from a significant level of 0.05. It's mean that H_1 is accepted and H_0 is rejected, so there is an influence of the blended learning model on the learning interest.

Research conducted by Umami (2022) based on research that has been done, prove that the Sig. The use of the blended learning model (X) on interest (Y1) is $0.00 < 0.05$, which means that the blended learning model has significant and positive effect for student in learning interest. While the significant value use of blended learning models.

Meanwhile, research by Dannisih et al., (2022) The finding of the study stated that the Blended Learning learning model improved the quality of learning and had an effect on student learning outcomes. Applying the Blended Learning learning model, teachers will be able to diversify teaching and learning, analyze learning problems, and find optimal solutions in improving student learning outcomes.

Based on the background above, the objectives of this study are to analyze the effect of blended learning on learning outcomes, to analyze the effect of blended learning on learning interest, to analyze how much influence blended learning has on learning outcomes in Harmony in the Ecosystem of class 5, Sale District, Rembang Regency.

Conceptual framework

During the COVID-19 pandemic, new problems were found in teaching and learning activities. Activities carried out must be based on the concept of online and virtual communication. The problem is that online learning tools and facilities are not supported, especially for students, the majority of whom do not have a device and lack network accessibility and connectivity in rural schools. (Setiadi,2021)

Blended learning is a combination of face-to-face learning in class and online learning in enhancing active learning by minimizing face-to-face learning in class. According to (Firdaus, 2020) stated that blended learning is a learning that mixes various strategies that provide, learning models, and various technological media. Students are will be able to understand learning well and be active (Permana, et al., 2021). Through the nature of Blended Learning learning which is more flexible than conventional or face-to-face learning, students can learn according to their own pace of understanding and can stimulate the activeness of students get more involved in the learning process with the availability of various facilities in accessing material and learning activities.

According to Rusmono (2017) states that learning outcomes are changes in individual behavior which includes the cognitive, affective, and psychomotor domains. This change in behavior is obtained after students complete their learning program through interaction with various learning resources and learning environments. Learning outcomes are behaviors that can be observed and show one's abilities (Numertayasa et al., 2022). Student abilities which are changes in behavior as a result of learning can be classified in certain dimensions. From the several opinions above, learning outcomes can be interpreted as the result of the teaching and learning process both cognitive, affective, and psychomotor with an assessment that is in accordance with the educational institution's learning curriculum.

Interest is what he calls subject-related affect, which includes interest in and attitude toward the subject matter. Interests are always on the move but even so he wants activity. He often bases his activities on his own choice and can prefer to work on certain things than others (Arikunto, 2006) Interest is not only based on activities that a person likes and chooses himself, but interest is also based on a person's cognition of an object. This is explained according to Interest is a person's cognition of an object, a problem or a situation that has something to do with him.

Blended learning maybe one of the most suitable solutions for Indonesia teachers who haven't joined the training and haven't conducted the research. They don't only need the training but also need the facilitator to guide them to conduct the research. Using blended learning can motivate self-directed learning and enhance the research skills. (Setiadi G,2016: 713)

Research objectives

This study was to analyze the effect of blended learning on learning outcomes, to analyze the effect of blended learning on learning interest, to analyze how much influence blended learning has on learning outcomes in Harmony in the Ecosystem of class 5, Sale District, Rembang Regency.

2. Methodology

Research design

The type of this research is a quantitative with an experimental research design, therefore the implementation uses experimental group students and control group students whose selection is not random (as is). In the experimental group, the researcher gave a learning treatment using realistic, which aims to see the symptoms or the impact on students related to problem-solving skills. Furthermore, to see the symptoms that appear in the subjects being treated, a group of comparison subjects called the control group is required. This is done to see if there is a difference, or to compare the average value of problem-solving abilities in the experimental group with the control group.

The research design was a non-equivalent control group. The non-equivalent control group is almost the same as the pretest-posttest control group design, only in this non- equivalent design the control and experimental group in a structured manner selected (Sugiyono, 2016). In this study, there were two groups that were not taken at random, but the researchers accepted the subject as is, namely the experimentak and control group, as well as the presence of posttest and pretest in each group.

Assessment of learning outcomes is only related to the final product and has not been based on product standards. While the pre-test questions contain material questions to be observed, namely related to Harmony Materials in Ecosystems. After getting the treatment, a final test (posttest) was carried out to see the capability of blended learning on the results and interest in student learning in Harmony in Ecosystems material, whether it is more influential with the blended learning approach or more influential with the conventional approach.

Respondents of the study

The population in this study were all 5th grade elementary school students in Sale District. The reason for the population restriction is related to the effectiveness of the research implementation, where the characteristics of this study are very dependent on the research subjects taken. The sample in this reserch was the 5th grade students at SD Negeri 2 Wonokerto as the experimental class and class V at SD Negeri 1 Mrayun as the control class.

3. Findings and Discussion***Findings***

The research data were obtained from the posttest and pretest values of the experimental class and the control class. Data on interest in learning were also obtained from distributing questionnaires to the experimental and the control class, which consisted of 10 questions. Data on independent T test learning outcomes in the experimentak class and control class are shown in table 1

Table 1. Test t Independent Sample Test learning outcomes

	Significance	Significance		Mean Difference	Std. Error Difference
		One-Sided p	Two-Sided p		
Hasil Belajar	Equal variances assumed	<,001	<,001	15,348	3,491
	Equal variances not assumed	<,001	<,001	15,348	3,491

Based on the "Independent Sample Test" output table, the sig. value is 0.001 <0.05, so it can be concluded that there is a significant difference between the learning outcomes of the experimental class and the control class in the Science Subject of grade 5 students in Sale District, Academic Year 2023/2024.

To find out how much influence the application of blended learning has, the data is processed using SPSS, namely the N Gain test shown in the table 2.

Table 2. N-Gain Score Test Calculation Results

	Kelas Eksperimen	Kelas Kontrol
Rata - rata	69,70	36,33
Maksimal	100,00	56,90
Minimal	34,00	13,79
N Gain	Sedang	rendah
Efektivitas	Cukup Efektif	Tidak Efektif
Peningkatan N Gain	33,37	

Based on the group statistical output table, it is known that the average N Gain value for the experimental class is 69.70. This score is included in the moderate category which can be said to be quite effective in improving student learning outcomes. While the average value of N Gain in the conventional class is 13.79. This score is in the low category and can be said to be ineffective in improving student learning outcomes. Statistically descriptively it can be said that there are differences in the effectiveness of applying conventional models to blended learning.

Table 3. Independent Samples Test

t-test for Equality of Means				
		Significance		Mean Difference
		One-Sided p	Two-Sided p	
Hasil Belajar	Equal variances assumed	<,001	<,001	-34,130
	Equal variances not assumed	<,001	<,001	-34,130

Based on the "Independent Sample Test" output table, the significant value is 0.001 <0.05, so it can be concluded that there is a significant difference between the learning interest of the experimental class and the control class in the Science Subject of grade 5 students in Sale District, Academic Year 2023/2024.

Discussion

Educators must have knowledge and skills in using learning tools and resources to help achieve learning objectives. Learning outcomes are important things that need to be considered achievement. Learning outcomes are influenced by many factors, including children's interests, teacher motivation, infrastructure, strategies and appropriate learning models and other factors.

According to Kusaeri, by entering the online world, educators can obtain various information needed to meet the needs of learning materials. Text, images, photos, videos, simulations are some examples of media that can be accessed on learning sites. In the current implementation of the Independent Curriculum, teachers are freed to teach according to the interests, talents and characteristics of their students. All teachers are equipped with a learning id to explore the Merdeka Teaching platform to find sources of material, inspiration, share and take part in training independently.

Basically, there is no best or less good learning model. Everything is adjusted to the learning objectives, material characteristics, student characteristics, available time allocation and other considerations. One effort that can be applied to improve student learning outcomes and interest in this digital era is blended learning.

This research on the application of the blended learning model was carried out in the control class and the experimental class. Class selection is based on observations of schools that have the same or nearly the same basic abilities so that later learning outcomes can be compared. Class selection is also based on the number of students who can later represent the data in the study. The research involved SD Negeri 1 Mrayun as the control class which applied the conventional learning model and SD Negeri 2 Wonokerto as the experimental class which used the blended learning model. The students used in the learning were grade 5 students with a total of 23 students from SD Negeri 2 Wonokerto and 23 students from grade 5 from SD Negeri 1 Mrayun.

Learning takes the Harmony in Ecosystem chapter because it is in accordance with the annual program and semester program which have been adapted to the Education calendar. This lesson has never been taught before so that the results of the posttest will be compared between the two classes. The Experimental Class applied blended learning mode where students were given learning videos and given the task of observing the surrounding environment and preparing tools and materials for practice the following day. Whereas the control class applied conventional learning with the teacher giving material, students listening to note the material and then working on the questions.

The two classes experienced different learning, after learning students were given the same posttest questions then the results were analyzed using the SPSS 29 application. After learning they were also given a learning interest questionnaire whose results were also processed using the SPSS 29 application to find out whether there were differences in the results from the experimental and control class.

The pretest and posttest questions for both classes are the same. The questions given have been tested in other schools, namely SD Negeri Rendeng. From the questions that have been tested for reliability, validity, distinguishing power and level of difficulty through the SPSS 29 application. The questions used are 12 questions.

The posttest and pretest results of the experimental and control class were tested for normality and homogeneity as prerequisite tests. From the results of SPSS 29 data processing, it can be seen that the values are normally homogeneous and distributed. From the posttest control class and the experiment, it was tested again using the independent sample T test to show that there was a significant difference. The results of data processing showed that there was an increase in the significance of the learning outcomes of the two classes being compared. To find out how much the increase in learning outcomes is then the N Gain test is carried out. From the results of N Gain through SPSS 29, an increase of 33.37 was obtained. All test results can be seen in the table and complete SPSS 29 output data can be seen in the attachment.

4. Conclusions and recommendations

From the results of this study, it can be concluded that the blended learning learning model has an effect on learning outcomes in Harmony in the Class 5 Ecosystem, Sale District, Rembang Regency, as evidenced by the results of the independent T test which shows significance. The significant level is $0.02 < 0.05$ which means H_0 is rejected. The blended learning learning model has an effect on learning interest in Harmony in the Ecosystem of class 5, Sale District, Rembang Regency, as evidenced by the results of the independent T test which shows significance. The significance level is $0.001 < 0.05$ which means H_0 is rejected. The blended learning learning model has a high effect on student learning outcomes in *Harmony* in the Ecosystem of class 5, Sale District, Rembang Regency, as evidenced by the N Gain results which have increased by 33.37.

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