Alternative Use of Blended Learning Model in Mathematics Learning for Elementary School Education

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Abstract

Technological developments in the 21st century have played a major role in advancing the quality of learning in education. This technological development is realized through various efforts and the use of available technology, such as the SIDIKMU digital application at SD Muhammadiyah 1 Paron. The application is used as a learning medium and can be used in blended learning. The benefits of using the SIDIKMU application in learning mathematics at SD Muhammadiyah 1 Paron show that students are given space to study independently, access applications to find materials, and send personal work results. This study uses a field research approach or field research, the subjects of this research are students of classes V-a and V-b, totaling 19 and 20 participants. The instruments used are observation, discussion notes, questionnaires, student learning outcomes data, and interviews. Research data shows that 70% of the experimental class students stated that they responded as “very interested” in participating in learning with a digital-based blended learning model as a learning resource and the results of the post-test in this class had an average score of 76.78.

Key words:

Introduction

Technological advances in the 21st century have had a major influence on various areas of life, one of which is the quality of education. Education aims to continuously improve competence and quality training for better quality and to be able to compete. Education, in general, is growing with technological advances, in this case, better, creative, innovative, and quality learning strategies can be applied to the education sector for quality and quality human resources competition. One of the implementations of technology in the world of education is e-learning. E-learning is one of the breakthroughs in the world of education, innovation from technological developments and education combined into one as evidence of the progress of the times. Learning by combining learning and the internet to keep up with the times in this digital era that uses the services of electronic devices such as computers and the internet. Bezhovski, (2016) revealed that the e-learning teaching and learning process is given using a computer or mobile device that can support learning.

E-learning can be an alternative learning method under certain conditions if face-to-face learning cannot be carried out with the help of internet-based learning or distance learning. Online learning is a learning activity by
utilizing the internet network, and local area network as a method of interacting in learning such as delivering material (Mustofa et al, 2019). Online learning can be done with a computer, laptop, or smartphone facilities that are connected to the internet network. With these facilities, teachers and students can study together at the same time using platforms such as WhatsApp, Telegram, Zoom, Meets, and Google Classroom (Fitriah, 2020).

However, online learning does not always have a good impact on students, many obstacles or problems occur during learning. Students do not understand the material explained by the teacher, feel bored with the learning carried out and the social spirit of students is reduced because they do not directly meet the teacher and their colleagues.

With this, innovation in the world of education is needed, especially to reduce negative impacts on elementary school students, one of which is by applying the Blended Learning learning model.

Chaeruman, (2017) blended learning is a learning system that combines synchronous learning strategies and asynchronous learning strategies to create a learning experience to achieve optimally determining learning outcomes. Blended learning has the following characteristics: Combining the two best strategies, namely synchronous in the classroom and asynchronous outside the classroom, the weaknesses of traditional learning can be integrated into online learning, aiming to achieve optimum learning effectiveness. The blended learning model is an innovation of the learning model, which teachers can apply to elementary school students. To provide a new learning innovation that is fun and more effective, efficient, and innovative so that students also have a passion for learning.

The blended learning model has the aim of facilitating learning by providing various learning media by taking into account the characteristics of students in learning. This learning can also encourage participants to make the best use of face-to-face contact in developing knowledge. However, what happens is that the use of the blended learning model is different from face-to-face activities in the classroom, Blended learning offers better learning, either separately or in groups and at the same or different times. Learning materials can be visualized in a more interesting and dynamic form. Using various learning variations can increase students' enthusiasm for learning.

Learning is a process in the administration of education. Learning is the key to the success of a goal in the world of education which is characterized by relatively positive changes in student behavior as a form of interaction with the environment. Learning shows activities that are carried out by someone conscious or intentional. This activity refers to a person’s activeness in carrying out mental aspects that allow changes to occur in him. Learning activities are also interpreted as individual interactions with their environment. The environment in this case is other objects that allow individuals to gain experiences or knowledge, both new experience or knowledge or something that has been obtained or discovered before but raises attention back to the individual so that interaction is possible.

The teaching and learning process is essentially a process of delivering messages from the introductory (teacher) to the recipient (student) which is delivered orally or in writing. According to Wahyulestari (2018), Learning is a human process to achieve various kinds of competencies, skills, and attitudes, all of which are usually done by everyone from birth to the end of life. In the Big Indonesian Dictionary, etymologically learning means “trying to gain intelligence or knowledge". While learning is a conscious effort to manage the teaching and learning process. Learning is a process of communication, between a teacher and students which is carried out in a room or building. Teachers as facilitators who provide and provide learning materials to students while students as recipients who can capture and digest what the teacher conveys. Learning can be done anywhere and anytime because knowledge has no limits and is endless. However, good learning is carried out in an organized and coordinated manner so that it can give birth to effective and optimal learning.

Learning is a process in the administration of education. Learning is the key to the success of a goal in the world of education which is characterized by relatively positive changes in student behavior as a form of interaction with the environment. Learning shows activities that are carried out by someone conscious or intentional. This activity refers to a person’s activeness in carrying out mental aspects that allow changes to occur in him. Thus, it can also be understood that a learning activity is said to be good if the intensity of a person's physical and mental activity is higher. On the other hand, even though a person is said to be learning if his physical and mental activity is low, it means that the learning activity does not understand that he is doing Pane and Muhammad’s learning activities. (2017).

Method
The population in this study were fifth-grade students of SD 1 Muhammadiyah Paron Ngawi. The field research approach or field research is research carried out to understand social phenomena and prioritize data collection techniques through observing the surrounding conditions. While the type of research used is descriptive qualitative to explain and analyze the circumstances around when the implementation of mathematics learning takes place with Blended Learning in elementary schools. The subjects of this study were students of classes V-a and V-b, totaling 19 and 20 participants. The variable used is the dependent variable, namely learning mathematics in classes V-a and V-b. The research location is at Muhammadiyah 01 Paron Ngawi elementary school.

This study used observation instruments, discussion notes, questionnaires, student learning outcomes data, and interviews.
a. Observation instruments are used to collect data when the blended learning process is implemented.
b. Discussion notes and interviews are used to obtain information about the implementation of blended learning.
c. The questionnaire instrument was used to determine the participants' responses to Blended Learning using school applications as well as zoom and google meet.
d. Data on student learning outcomes is used to measure students' ability to capture material understanding during blended learning.

Results & Discussion

The implementation of the research used two classes that were sampled through the stages of learning (4 meetings) and 1 post-test. The learning model applied to the two classes is different, namely, the experimental class uses a digital-based blended learning model, and the control class uses conventional learning. Posttest was held to determine student learning outcomes after participating in learning.

Research Results

Teacher Performance

a. The performance of the experimental class teacher

In general, the teacher in planning the lesson has done well. At the first meeting, the teacher’s performance was 60% included in the "enough" criteria. In the second meeting, the percentage of teacher performance of 72% was included in the "good" criteria between teachers and students there was interaction so that teachers could balance the activities of students during learning. In the third meeting, the percentage of teacher performance is 84% which is included in the "good" criteria. In the fourth meeting, the percentage of teacher performance is 96% which is included in the "very good" criteria. The teacher always evaluates the shortcomings students are getting used to learning and students are very enthusiastic about participating in the learning process.

b. The performance of the control class teacher

At the first meeting, the teacher’s performance was 52% which was included in the "less" criteria where at the first meeting in the learning process the teacher was not used to teaching in this class so the interaction between teachers and students had not gone well. In the second meeting, the percentage of teacher performance shows that the percentage is 62%. This can be seen that there is an increase in the percentage of teacher performance compared to the first meeting. In the second meeting, the percentage of teacher performance included in the "sufficient" criteria between teachers and students has begun to adapt to the teaching and learning process. In the third meeting, the percentage of teacher performance based on the results of the study was 76%. In the fourth meeting, the percentage of teacher performance is 80% which is included in the "good" criteria. This shows that the teacher’s performance reaches the "good" criteria. The teacher always evaluates the shortcomings in each meeting and the students seem to be getting used to the learning that is taking place. The performance of this teaching teacher will affect student learning activities in the learning process.

Student learning activities

a. The results of observations of student learning activities in the experimental class

At the first meeting the results of student activities were 40% with the criteria of "enough" students were not familiar with the models and media used by the teacher in delivering the material. This can be overcome by the success and observations at the second meeting of 47.4% of the third and fourth meetings of 70%, this means that students are getting used to the learning model used by the learning teacher and it is fun. This shows that students are getting used to the models and media used by the teacher so that learning goes well and is fun. Students have new experiences in learning because in previous learning students only studied with conventional models, this could affect students' interest in understanding the material taught by the teacher, namely the material of building data and broken numbers.

b. The results of observations of student learning activities in the control class

The conventional model is a learning model that is used by every teacher without using certain learning models and media. The teacher explains the material orally while the students explain the teacher’s explanation carefully. This does not provide new experiences to students, so students do not give a positive response in participating in learning. Student learning activities in the control class at the beginning of the fourth meeting were in the "active" criteria, the score increased at each meeting but only slightly. This means that the application of learning using conventional models has less effect on student activity.

c. The results of the questionnaire responses of the experimental class and control class

Students in the experimental class responded with "very interested" using a web-based blended learning model as many as 70% and students who stated "interested" as many as 20%. The results of the questionnaire analysis of student responses in the control class apply to learning using conventional models as shown in Table 5. Students...
who stated "interested" in using the conventional model were 55% and students who stated "very interested" were 25%, who stated "quite interested" 15%, and those who stated "less interested" 5%. So learning with digital–based blended learning models gets more positive responses from students than using conventional models.

d. Posttest Score
After the posttest was held, between the experimental class and the control class there was a significant difference in the acquisition of scores. The experimental class got an average of 70 while the control class average was 57.5. This strongly illustrates that the blended learning model can increase motivation and better student learning outcomes in the future.

![Figure 1. Control and Experiment Class Comparison Table](image)

Discussion

The blended learning model is a learning model that utilizes computer technology, especially the internet. The implementation of the digital–based blended learning model as a learning resource is carried out in class V–a as an experimental class. The teaching and learning process using a digital–based blended learning model as a learning resource is more suitable to be applied in teaching mathematics on the subject of geometric figures and fractions. This is because learning is not centered on the teacher so that student creativity can develop, besides that it will also create an effective teaching and learning process so that it can increase student interest and learning outcomes. The use of technology–based media allows learning to be carried out more varied so that it is not boring.

Judging from the observations of teacher performance, in general, it is included in the "good" criteria reaching 76%. This means that the teaching process carried out by the teacher is following the lesson plan. The application of learning with a digital–based blended learning model as a learning resource has a reciprocal relationship between students and teachers in the teaching and learning process. The teacher’s performance in teaching affects student learning activities in the learning process. Observation of students’ activities in participating in learning can be seen that in the experimental class students actively participate in the learning process. Each meeting shows an increase in student activity because the web–based blended learning model as a learning resource will encourage students’ motivation and curiosity about the material being studied.

After participating in the lesson, 70% of the experimental class students stated that they responded as "very interested" in participating in learning with a digital–based blended learning model as a learning resource and the post–test results in this class had an average score of 76.78. Learning in this experimental class can foster student interest in learning, eliminate student boredom in following the learning process, can help students understand what is being learned so that student learning outcomes can increase.

The implementation of conventional model learning is carried out in class V–b as a control class. Conventional model learning is not suitable to be applied to the material of building space and fractional numbers. This is because the material for broken numbers and geometric shapes is not only rote but also requires learning media in studying.
the material. This material is also directly related to the symptoms experienced in everyday life. The conventional model applied to the control class does not foster student activity. Students are active in learning when they receive a warning from the teacher. In the implementation of student behavior that tends to deviate. Students become indifferent to mathematics lessons, bored with the material being taught so they have the desire to make noise in class to seek attention. After being treated with a conventional model as many as 20 students responded that they were "quite interested" in this learning, it can be concluded that there are differences in learning outcomes between students who use web-based blended learning models as learning resources. With conventional learning in class V-b SD Muhammadiyah Paron Ngawi Regency for the 2020/2021 academic year. The average mathematics learning outcomes of students who are taught using a digital-based blended learning model are 70 while the average value of students who are taught using a conventional model is 57.5, it appears that the overall implementation of the learning process in the experimental class using a digital-based blended learning model is more supportive in mastering the material than in the classroom, control using conventional learning models.

Conclusion

Based on the discussion of the research results, the following conclusions can be drawn: (1) the implementation of learning that uses a digital-based blended learning model as a learning resource is better than learning using conventional models of building materials and fractions in fifth-grade students of SD Muhammadiyah 1 Paron Ngawi Regency in the teaching of 2020/2021 (2) there are differences in the results of learning mathematics in geometrical and fractional materials between learning using digital-based blended learning models and conventional learning models.

(3) The application of the blended learning model can be an alternative or a breakthrough for schools because it can make it easier for teachers and students if learning cannot be carried out face-to-face. The advice given is that teachers need to attend training on how to apply ICT-based learning media in mathematics subjects in particular, so that teachers can develop and use digital-based blended learning models in learning and for schools to provide infrastructure facilities to support smooth learning by completing tools in the multimedia room as well as in every classroom.

References