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Blended Learning Model Implementation Study to Improve Learning Outcomes Elementary School Student Mathematics

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Abstract

The background of this study is the low completion of student learning outcomes against five competencies in Mathematics lessons at the elementary school level. The use of teacher strategies is undoubtedly a critical consideration in overcoming the low learning outcomes of Mathematics at the elementary school level. Learning strategies using technology-based media that combine face-to-face learning in schools and remote online education expect to be a solution for teachers in overcoming the low outcomes of learning Mathematics at the elementary school level. Therefore, the author's purpose in researching this article is to examine implementing the Blended Learning model to improve mathematics learning outcomes for elementary school students. The method used by the author in this study is the systematic literature review method. Researchers reviewed 5 research articles on the Blended Learning model's implementation in mathematics published from 2019 to 2021 in elementary schools. The technique applied by the author in collecting data is the documentation technique. Then the instrument used by the author in this study is in the form of a list of classification order of research materials based on a research study focus and the format of research notes. This study resulted in a significant increase in the completeness of student learning outcomes in 5 different elementary schools from 5 researchs caused by teachers choosing to implement the Blended Learning model in Mathematics lessons.

Keywords: blended learning, learning outcomes, mathematics

INTRODUCTION

Nowadays, technology development attracts teachers' attention to be applied to the learning process from elementary school to the tertiary level. Learning strategies using technology expect to make it easier for teachers and students to achieve an indicator of learning objectives. One learning model at the elementary level that applies technology is the Blended Learning model. The Blended Learning model is an amalgamation of the benefits of a component of face-to-face and online learning with technology (Geng et al., 2019)(Rasheed et al., 2020). The Blended Learning model requires traditional learning strategies in face-to-face interactions and other learning strategies using technology to convey material information to students (Gaol & Hutagalung, 2020). The Blended Learning model combines a conventional and an online learning environment (Yang et al., 2021). Based on these various expert opinions, the Blended Learning model has the meaning of combining the components of the face-to-face

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learning environment with the learning components using online-based technology in conveying material information to students.

The Blended Learning model has advantages, including delivering workable subject matter in various places by utilizing online-based media. Students are given the freedom to learn independently. The purpose of learning indicators can be conveyed to students effectively, making it easier for students to access the subject matter. Students become familiar with technology (Maulana et al., 2020)(Tanjung et al., 2021). The Blended Learning model motivates teachers to change the approach to learning that was initially teacher-centered to student-centered learning (Ahmad et al., 2021). Thus, the Blended Learning model makes it easier for teachers to deliver material and more accessible for students to access a variety of meaningful material references through online media to achieve the objectives of learning indicators optimally.

This blended learning model will positively affect learning activities, including elementary mathematics lessons. Mathematics is a science related to abstract logical reasoning using various number symbols arranged systematically (Sari et al., 2022). Based on this description, Mathematics lessons can develop students' logical reasoning using number symbols. Sourced from the results of a study by Indah (2022), the Blended Learning model can make it easier for grade 4 elementary school students to understand the concept of mathematical material. This is also by the results of research by Rohmawati et al. (2021), which states that the Blended Learning model can cause an increase in elementary mathematics learning outcomes.

In elementary level education, problems often arise in mathematics lessons, including students who do not understand the subject matter. Therefore, the author studied several articles to hope that the Blended Learning model can be a solution for students who do not understand the material of the five competencies of Mathematics lessons. So that the focus of this paper is the study of the Implementation of the Blended Learning model to improve the learning outcomes of Elementary Mathematics. This study aims to determine the implementation of the Blended Learning model to improve elementary mathematics learning outcomes.

METHOD

This research uses the systematic literature review method, namely the accumulation of various research results based on studies that have been published through the procedure of searching, collecting, and analyzing available reference sources (Hezam & Nayeem, 2021).

Researchers reviewed 5 research articles on the Blended Learning model's application in mathematics published from 2019 to 2021 in elementary schools. The research data source obtained is secondary data, namely sources that do not directly provide data to the data collector through a document (Ade, 2019). The data collection technique in this study uses documentation techniques to look for a collection of various written data that matches research variables from book sources, photos, letters, articles, daily notes, and research reports (Anggito & Setiawan, 2018). The research instrument used is a sequence list of research material classifications based on a research study focus and the format of a research record (Saifuddin, 2020).

RESULTS AND DISCUSSION

Results

The procedure for identifying research is carried out so that the analysis of the data results found is avoided the error of a theory. Researchers conducted a study of 5 research articles that apply class action research methods to implementing the Blended Learning model to improve learning outcomes in Elementary Mathematics, namely as follows.

Table 1. Improving the Completeness of Learning Outcomes of Grade 6 Students of SD Negeri Jumputrejo

No	Description	Average Value	Completeness of Learning
1	Pre-cycle	69,28	10 Complete Students
2	Cycle 1	77,4	16 Complete Students
3	Cycle 2	86,1	24 Complete Students

Source: (Machfud, 2019)

Table 1 data is the result of research by Machfud (2019) on 28 grade 6 students of SD Negeri Jumputrejo on implementing the Blended Learning model to improve learning outcomes in Mathematics regarding fractional material.

Table 2. Improving the Completeness of Learning Outcomes of Grade 4 Students of SD Negeri Pisangan 01

No	Description	Average Value	Completeness of Learning
1	Pre-cycle	68	11 Complete Students
2	Cycle 1	80	23 Complete Students
3	Cycle 2	96	30 Complete Students

Source: (Roshonah et al., 2020)

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Table 2 data is the result of research by Roshonah et al. 2020 on 32 grade 4 students of SD Negeri Pingasan 01 on implementing the Blended Learning model to improve learning outcomes in Mathematics material regarding small guild multiples and multiples of large guilds.

Table 3. Improving the Completeness of Learning Outcomes of Grade 4 Students of SD Negeri 041 Tarakan

No	Description	Average Value	Completeness of Learning
1	Pre-cycle	44,17	3 Complete Students
2	Cycle 1	64,17	5 Complete Students
3	Cycle 2	81,25	22 Complete Students

Source: (Nurhasanah, 2020)

Table 3 data is the result of research by Nurhasanah (2020) on 24 grade 4 students of SD Negeri 041 Tarakan on implementing the Blended Learning model to improve learning outcomes in Mathematics regarding angle material.

Table 4. Improving the Completeness of Learning Outcomes of Grade 5 Students of Madrasah Ibtidaiyah Muhammadiyah 14 Pambon

No	Description	Average Value	Completeness of Learning
1	Pre-cycle	66,75	5 Complete Students
2	Cycle 1	86	6 Complete Students
3	Cycle 2	90	8 Complete Students

Source: (Nahdliyatin & Winata, 2021)

Table 4 data is the result of research by Nahdliyatin & Winata (2021) to 8 grade 5 students of Madrasah Ibtidaiyah Muhammadiyah 14 Pambon on the Implementation of the Blended Learning model to improve learning outcomes in the field of Mathematics regarding the material processing of a data.

Table 5. Improving the Completeness of Learning Outcomes of Grade 2 Students of SD Muhammadiyah 4 Surabaya

No	Description	Average Value	Completeness of Learning
1	Pre-cycle	<70	13 Complete Students
2	Cycle 1	84,64	20 Complete Students
3	Cycle 2	90	25 Complete Students

Source: (Islami et al., 2021)

Table 5 data is the result of research by Islami et al. (2021) on 28 grade 2 students of SD Muhammadiyah 4 Surabaya on implementing the Blended Learning model to improve learning outcomes in Mathematics regarding the material of a spacious building.

Discussion

Based on the data analysis, the five articles on implementing the Blended Learning model to improve learning outcomes in the field of Mathematics obtained the following data. The research results by Machfud (2019) in table 1, implemented on 28 grade 6 students of SDN Jumputrejo, increased learning outcomes regarding fractional material. This is based on the pre-cycle stage obtained data on the average score of 69.8, and 10 students achieved learning completion scores. Then Blended Learning was carried out so that in the setting of cycle 1, obtained an average score of 77.4, and 16 students achieved learning completion scores. After that, Blended Learning was carried out again so that at the stage of cycle 2, it received an average score of 86.1, and 24 students reached the learning completion score. Therefore, it is proven that the Blended Learning model can cause an increase in elementary mathematics learning outcomes.

The research results by Roshonah et al. (2020) in table 2, implemented to 32 grade 4 students of SDN Pingasan 01, showed increased learning outcomes regarding KPK and FPB materials. This is based on the pre-cycle stage obtained data on the average score of 68, and 11 students achieved the complete learning score. Then Blended Learning was carried out so that in cycle stage 1, obtained an average score of 80, and 23 students achieved learning completion scores. After that, Blended Learning was carried out again so that at the stage of cycle 2, obtained an average score of 96, and 30 students achieved the complete learning score. Therefore, it is proven that the Blended Learning model can cause an increase in elementary mathematics learning outcomes.

The research results by Nurhasanah (2020) in table 3, implemented on 24 grade 4 students of SDN 041 Tarakan, increased learning outcomes regarding angular material. This is based on the pre-cycle stage obtained data on the average score of 44.17, and 3 students achieved learning completion scores. Then Blended Learning was carried out so that at the scene of cycle 1, obtained an average score of 64.17, and 5 students reached the learning completion score. After that, Blended Learning was carried out again so that at the stage of cycle 2, obtained an average score of 81.25, and 22 students achieved learning completion scores. Therefore, it is proven that the Blended Learning model can cause an increase in elementary mathematics learning outcomes.

The research results by Nahdliyatin & Winata (2021) in table 4, implemented to 8 students of grade 5 MI Muhammadiyah 14 Pambon, showed an increase in learning outcomes regarding processing material. This is based on the pre-cycle stage obtained data on the average

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score of 66.75, and 5 students achieved learning completion scores. Then Blended Learning was carried out so that at the scene of cycle 1, obtained an average score of 86, and 6 students achieved learning completion scores. After that, Blended Learning was carried out again so that at the stage of cycle 2, obtained an average score of 90, and 8 students achieved learning completion scores. Therefore, it is proven that the Blended Learning model can increase elementary mathematics learning outcomes.

The research results by Islami et al. (2021) in table 5, implemented on 28 grade 2 students of SD Muhammadiyah 4 Surabaya, showed increased learning outcomes about a space building. Based on the pre-cycle stage, obtained the average score data of < 70, and 13 students achieved learning completion scores. Then Blended Learning was carried out so that at cycle stage 1, obtained an average score of 84.64, and 20 students completed learning completion scores. After that, Blended Learning was carried out again so that at the stage of cycle 2, obtained an average score of 90, and 25 students achieved learning completion scores. Therefore, it is proven that the Blended Learning model can cause an increase in elementary mathematics learning outcomes.

Based on five studies from the article's content, it is proven that the Blended Learning model can cause an increase in the learning outcomes of elementary school students in Mathematics learning. This is in line with the results of a literature review research from Rohmawati et al. (2021), which states that elementary schools that apply to learn using the Blended Learning model significantly influence students' mathematics learning outcomes. The Blended Learning model can cause an increase in student learning outcomes from the basic education level to the tertiary level, and students are easier to master the concept of material from the teacher's direction to trigger learning activities (Sukma & Priatna, 2021)(Lusa et al., 2021).

CONCLUSION

Many researchers obtained various trials from class action research based on the results and discussion. Implementing the Blended Learning model can trigger student activity in their learning process caused by conventional learning collaboration and technology-based online learning. This makes it easier for elementary school students to understand the material of the Mathematics lesson. Thus, it is proven that implementing the Blended Learning model in Mathematics lessons can increase learning outcomes for elementary school students. Researchers are recommended to further expand this research by analyzing more literature

studies from other online libraries to broadly investigate the implementation of the Blended Learning model for students and teachers related to learning outcomes in the field of elementary school mathematics in a particular region.

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