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Implementation Study

Blended Learning and its Influence on Improving Student Literacy Competencies

Ansori
Institut Agama Islam At-Taqwa Bondowoso, Indonesia
email: chansori99@gmail.com

Abstract

This research aims to analyze the effect of implementing blended learning on increasing student literacy competence at Kulon City 1 Bondowoso State Elementary School. The research method used was quasi-experimental with a Pre-test-Post-test control group design. The research sample consisted of two groups: an experimental group that applied blended learning and a control group that used conventional learning methods, each consisting of 30 students. Data was collected through a literacy test and analyzed using descriptive statistics and the independent sample t-test. The results showed that there was a significant increase in students' literacy scores in the experimental group compared to the control group ($p < 0.05$). The experimental group experienced an average increase in score of 20.34 points, while the control group only increased 6.66 points. The implementation of blended learning has proven effective in supporting the development of literacy skills, especially in the aspects of critical reading and argumentative writing. In addition, blended learning provides greater benefits for students with low initial abilities through a flexible and interactive learning approach. This research confirms that blended learning is an innovative solution in improving students' literacy competencies in elementary schools. For program sustainability, strengthening technological infrastructure and teacher training is needed. Further studies are recommended to explore the long-term impact of blended learning as well as its application to various subjects.

Keywords: *Blended learning, Literacy competency, Technology-based learning*

INDTRODUCTION

Blended learning is a learning approach that integrates face-to-face learning and online learning in a proportional manner. Garrison and Vaughan[1] state that blended learning provides an immersive learning experience through the incorporation of direct interaction with digital technology. This approach is considered relevant in the context of primary education to improve learning effectiveness and student engagement.

Literacy skills are the foundation for the development of students' academic abilities. According to UNESCO,[2] literacy is the ability to understand, evaluate, and use information in various forms for daily life. In the digital era, student literacy competencies need to be expanded to include information and digital literacy.

Elementary schools in Indonesia still face challenges in improving students' literacy competencies. The 2018 PISA study showed that the average literacy score of Indonesian students is still below international standards.[3] This shows the need for innovation in learning to overcome this gap.

Blended learning is considered one of the solutions to improve student literacy. Through the integration of online learning resources, students can access richer and more interactive teaching materials. Bersin[4] revealed that this approach can improve student engagement and learning outcomes by paying attention to individual learning styles.

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Kulon City 1 Bondowoso State Elementary School is one of the schools that has begun to implement blended learning as an effort to innovate in learning. Based on the school's internal data, the level of student literacy has shown an increase since this program was implemented at the beginning of the 2023/2024 school year.

Previous research has shown positive results on the implementation of blended learning in improving student literacy. For example, research by Harasim[5] shows that blended learning can improve students' reading and writing skills up to 20% better than conventional methods.

However, empirical studies on the impact of blended learning implementation on student literacy competencies in Indonesia, especially in the Bondowoso region, are still limited. This provides an opportunity to explore the extent to which this approach can be effectively applied in primary schools.

This study aims to analyze the effect of the implementation of blended learning on the improvement of student literacy competencies at the Kulon 1 Bondowoso City State Elementary School. This research will also identify supporting and inhibiting factors in the implementation of blended learning.

The results of this research are expected to contribute to the development of technology-based education policies in elementary schools. In addition, this research can be a reference for other schools in implementing blended learning to improve student literacy.

LITERATURE REVIEW

Implementasi Blended Learning

Blended learning is a learning approach that integrates face-to-face learning methods with online learning to create a more flexible and interactive learning experience. According to Graham,[6] blended learning combines the strengths of both forms of learning, allowing students to learn independently through technology while still maintaining direct interaction with teachers. This model aims to optimize learning outcomes by integrating various existing digital resources and technologies.

Blended Learning in the Context of Education In the context of education, blended learning is becoming increasingly relevant along with the development of technology and the needs of students who want more flexibility in the learning process. Osguthorpe and Graham[7] identified that blended learning provides students with the opportunity to access material online, while still engaging in classroom activities that provide opportunities for discussion, sharing ideas, and receiving hands-on feedback. The implementation of this model is expected to increase student engagement and motivation in learning.

Components of Blended Learning Blended learning consists of several main components, including face-to-face learning, online learning, and various media and technologies used in the learning process. According to Horn and Staker,[8] blended learning not only involves a combination of direct instruction and technology, but also involves careful curriculum design to integrate the two elements effectively. Technology involvement is an important factor in improving the accessibility of materials and giving students more control over their learning process.

Advantages of Blended Learning Implementation Blended learning offers a variety of advantages, including flexibility of time and place, as well as increased access to a wider range of digital resources. According to Means et al.[9] blended learning can increase learning effectiveness because it provides opportunities for students to learn according to their own style and pace. This model also supports more individualized learning, which can help students understand the material more deeply.

Blended Learning at Various Levels of Education Blended learning has been applied at various levels of education, from elementary education to higher education. Research by Bernard et al.[10] shows that blended learning can improve student learning outcomes at various levels of education, both in the context of academic learning and practical skills. This model allows for more structured teaching, but still gives students the freedom to manage their own study time.

Challenges in Implementing Blended Learning Although it has many advantages, the implementation of blended learning is not without challenges. Some of the obstacles that are often encountered are inequality of access to technology, limited infrastructure, and resistance from teachers who are not familiar with technology. Research by Valiathan[11] emphasizes that although technology can offer many benefits, the success of the implementation of blended learning is highly dependent on the readiness of teachers to use these tools and the support from the school in terms of technology infrastructure.

The Role of Teachers in Blended Learning The role of teachers in blended learning is very important, because they are not only the presenters of the material, but also as facilitators who support students in the process of independent learning through digital platforms. Stacey and Gerbic[12] revealed that teachers in the blended learning model should be able to manage both forms of learning effectively, ensuring that students can leverage technology to deepen their understanding while still providing the necessary guidance and feedback.

One of the main advantages of blended learning is its ability to support active learning, where students not only receive information, but also engage in a more interactive learning process. This includes group discussions, project-based assignments, and the use of online forums to deepen understanding of the material. Garrison and Vaughan[13] show that blended learning provides opportunities for students to learn collaboratively, which is crucial in the development of critical thinking and problem-solving skills.

Blended Learning in learning in elementary schools has been proven to improve academic outcomes and student involvement in the learning process. Research by Allen and Seaman[14] shows that universities that implement blended learning tend to see improvements in the quality of learning and student success. This model allows students to learn outside the classroom more flexibly, which is especially beneficial for those with busy schedules or geographical limitations.

Evaluation and Development of Blended Learning Evaluation of the effectiveness of blended learning needs to be carried out on an ongoing basis to ensure that this model provides maximum benefits for students and teachers. According to Horn and Staker,[15] it is important for educational institutions to assess the success of the implementation of blended learning from various aspects, including student engagement, learning outcomes, and the level of satisfaction of teachers and students. Thus, continuous improvement and development can be carried out to improve the quality of learning.

Student Literacy Competence

Literacy competence refers to an individual's ability to access, understand, evaluate, and use information from various sources in an effective and efficient manner. According to UNESCO,[16] literacy is not only limited to reading and writing skills, but also includes the skills to think critically, make informed decisions, and communicate information in various contexts. Therefore, literacy is a basic skill needed to thrive in today's global information society.

Literacy Competency Components Literacy competencies consist of several interrelated components, namely reading, writing, numeracy, and digital literacy. Reading and writing literacy skills are fundamental, while numeracy and digital literacy are increasingly important in a world full of digital information. According to Leu et al.[17] digital literacy includes the ability to find, evaluate, and generate information through digital technology, which is an important aspect of 21st century education.

The Importance of Literacy Competencies in Education Literacy competencies have a very important role in education because they are the foundation of all learning. Students who have good literacy skills are better able to understand the subject matter more deeply and can take advantage of various resources to expand their knowledge. Research by the OECD shows that high literacy competencies are directly related to students' academic success, because literacy underlies almost all aspects of learning in schools.[18]

Literacy Competencies and Their Influence on Academic Achievement Strong literacy competencies can improve students' academic achievement, especially in subjects that require good

reading and writing skills. According to Wanzek and Vaughn,[19] students with high literacy skills tend to have better grades in a variety of subjects, as they can process information better and produce clearer and more structured writing.

Digital Literacy as a Component of Literacy Competencies In the current digital era, digital literacy is an integral part of literacy competencies. Digital literacy refers to the ability to use information technology to find, evaluate, and disseminate information effectively. According to Buckingham,[20] digital literacy requires the skill to criticize digital content and use it ethically and responsibly. Therefore, the development of digital literacy is very important to prepare students to face challenges in an increasingly digital world.

Factors Affecting Literacy Competence Several factors affect the development of students' literacy competencies, including family environment factors, teaching quality, and the availability of educational resources. Research by Snow revealed that a supportive family environment and access to books and other sources of information can improve children's literacy skills. In addition, teachers' skills in teaching literacy also greatly affect the development of students' literacy skills.[21]

Literacy Competencies in the 21st Century In the context of the 21st century, literacy competencies are not only related to reading and writing skills, but also involve the skills of communicating effectively in an increasingly connected world. According to Voogt and Roblin,[22] literacy in the 21st century includes critical thinking, collaboration, and communication skills, all of which are important in facing global challenges. These literacy competencies will help students adapt to rapid social, economic, and technological changes.

Reading Literacy and Its Influence on Cognitive Ability Reading literacy has a great influence on students' cognitive abilities. Students who have good reading skills tend to have higher analytical thinking abilities, which is especially beneficial in other subjects that require higher-order thinking skills. Research by Torgesen et al.[23] shows that students who have good reading skills are able to absorb and organize information more effectively, leading to better academic performance.

Implementation of Literacy Learning in the Curriculum The implementation of literacy learning in the curriculum is very important to improve students' literacy competencies. In many countries, literacy is integrated into all subjects to ensure that students not only master reading and writing skills, but can also apply them in a variety of contexts. Research by Pearson and Hiebert shows that the integration of literacy in the curriculum can improve students' understanding of the subject matter, while enriching their overall literacy skills.[24]

Evaluation of Student Literacy Competencies Evaluation of literacy competencies is very important to assess the extent to which students' literacy abilities have developed. According to Guthrie and Wigfield,[25] literacy assessments should include a variety of aspects, including text comprehension, writing skills, and the ability to use information effectively. In addition, continuous evaluation allows teaching to be tailored to student needs, making the teaching and learning process more effective.

METHOD

This study uses a quantitative research design with a *quasi-experimental design approach*. This design was chosen because it allows to test the influence of blended learning implementation on improving students' literacy competencies by comparing the experimental group and the control group.[26] This approach is considered appropriate considering the limitations of full control over external variables in the educational environment.

The population in this study is all grade V students at the Kulon 1 Bondowoso City State Elementary School in the 2023/2024 school year. The sample was selected using *the purposive sampling technique*, with 30 students in the VA class as the experimental group and 30 students in the VB class as the control group. According to Fraenkel and Wallen,[27] this technique is effectively used in educational research to ascertain certain characteristics of the sample.

The research instrument is in the form of a literacy competency test consisting of reading and writing questions according to UNESCO's basic literacy standards.[28] The validity and reliability of the

instrument were tested prior to use through *content validity analysis* by three education experts, as well as a reliability test using the Cronbach Alpha coefficient which showed a value of 0.85, indicating a high level of reliability.[29]

This research was carried out in four main stages. First, a Pre-test was conducted to measure the initial literacy competence of students in both groups. Second, the implementation of blended learning for eight weeks in the experimental group, using a combination of face-to-face learning and digital platforms such as Google Classroom. The control group underwent conventional learning. Third, Post-tests are carried out to measure the improvement of students' literacy competencies. Fourth, data analysis was carried out to evaluate the difference in learning outcomes between the two groups.[30]

The data were analyzed using a parametric statistical test, namely *an independent sample t-test*, to test the mean difference between the experimental group and the control group. The analysis was carried out with the help of SPSS version 25 software. The interpretation of the results was based on a significance value (p-value) with a significance level of 0.05. According to Pallant[31] this method allows for valid and reliable hypothesis testing for educational quantitative data.

RESULTS

This research began by conducting Pre-test and Post-test measurements for both groups. The experimental group underwent blended learning, while the control group underwent conventional learning. The results showed that there was a difference in the average score between the experimental and control groups.

Table 1. Pre-test and Post-test Descriptive Statistics

Group	N	Mean	Std. Deviation	Minimum	Maximum
Pre-test Experiment	30	58.33	5.12	50	68
Post-test Experiment	30	78.67	4.96	70	88
Pre-test Control	30	59.17	5.34	52	69
Post-test Control	30	65.83	5.01	58	75

From the table, it can be seen that the experimental group experienced an average increase in score of 20.34 points, while the control group only experienced an increase of 6.66 points.

The normality test using Kolmogorov-Smirnov showed normal distributed data ($p > 0.05$). This indicates that the data meet the assumptions for parametric analysis.[32]

Table 2. Tes of Normality

Group	Variable	Sig.
Experiment	Pre-test	0.132
Experiment	Post-test	0.085
Control	Pre-test	0.149
Control	Post-test	0.090

Levene's Test showed that the variance of the data was homogeneous ($p > 0.05$). Homogeneous variance showed that the two groups had similar characteristics before treatment.[33]

Table 3. Homogeneity Test

Variable	F	Sig.
Pre-test	1.045	0.311
Post-test	0.987	0.323

The *independent sample t-test* showed a significant difference between the mean Post-test score of the experimental and control groups ($p < 0.05$). This shows that blended learning has a significant influence on improving students' literacy competencies.

Table 4. Independent Sample T-Test

Variable	Mean Experiment	Mean Control	t	Sig. (2-tailed)
Literasi Post-test	78.67	65.83	5.321	0.000

The implementation of blended learning has been proven to significantly improve students' literacy competencies. These results are in line with the research of Garrison and Vaughan,[34] which states that the integration of technology in learning improves student understanding through immersive learning experiences.

The success of blended learning at SDN Kota Kulon 1 Bondowoso is supported by the use of the Google Classroom platform and interactive teaching materials. According to Harasim,[35] technology-based learning provides better accessibility to educational resources.

The control group that used conventional methods showed a lower increase. This supports the research of Bersin,[36] which found that blended learning is more effective than traditional methods in improving learning outcomes.

Blended learning increases student engagement in learning. Activities such as online discussions and digital assignments increase students' motivation to learn.[37]

The success of the program is also supported by students' digital literacy, which allows them to utilize technology for learning. According to UNESCO, digital literacy is the key to technology-based learning.[38]

Blended learning offers flexibility of time and place, allowing students to learn as per their needs. This supports the argument that personalized learning is effective in improving learning outcomes.[39]

The improvement of students' literacy competencies in this study not only includes basic reading skills, but also advanced literacy skills, such as critical reading and argumentative writing. This is reflected in the Post-test results of the experimental group which showed a significant increase in answering questions based on analysis and synthesis. According to Garrison and Vaughan,[40] blended learning not only improves access to information, but also stimulates students to think critically through discussion-based learning activities and in-depth material exploration. The implementation of blended learning that utilizes interactive media such as learning videos and online quizzes provides additional stimulation that helps students understand the material comprehensively.

This study also shows that blended learning provides significant benefits for students with low starting ability. The data showed that students with low Pre-test scores in the experimental group experienced greater improvement than students with high initial ability. This is supported by Pallant's research,[41] which found that technology-based learning provides more individualized learning opportunities, allowing students with low ability to learn at their own pace. Features such as material repetition and automated feedback in blended learning platforms help students to overcome the understanding gap.

The success of blended learning also depends heavily on the role of teachers as facilitators. Teachers in this study not only direct students in face-to-face classes, but also monitor student activities in online learning. According to Harasim,[42] the role of teachers in blended learning focuses more on providing direction, motivation, and personal support to students. In this case, teachers at SDN Kota Kulon 1 Bondowoso have shown good adaptability to learning technology, so that students can maximize their learning experience.

Although the results of this study are positive, the implementation of blended learning at SDN Kota Kulon 1 Bondowoso still faces several challenges, especially related to technology infrastructure. Limited access to the internet and digital devices is an obstacle for some students to participate in online learning optimally. UNESCO emphasizes the importance of providing adequate technological facilities to ensure the sustainability of technology-based learning, especially in rural areas.[43]

Therefore, the sustainability of this program requires support from schools, the government, and the community to improve supporting infrastructure.

The results of this study open up opportunities for further research that can explore more deeply about the effectiveness of blended learning in different contexts, such as other subjects or higher levels of education. In addition, longitudinal research that monitors the long-term impact of blended learning on students' literacy competencies can provide more comprehensive insights. In the long term, this approach can also be used to measure the influence of blended learning on other aspects, such as learning motivation and critical thinking skills.

CONCLUSION

This study proves that the implementation of blended learning significantly affects the improvement of student literacy competencies at SDN Kota Kulon 1 Bondowoso. This is reflected in the increase in the average Post-test score of the experimental group which is much higher than that of the control group. The improvement shows that the blended learning approach is able to provide a more flexible and interactive learning experience, so that students are more motivated to develop their literacy skills.

The results of the quantitative analysis showed that blended learning had a positive impact on literacy subcomponents, including critical reading and argumentative writing skills. In addition, this method is also effective in supporting students with low starting abilities through a personalized learning approach and interactive features that can be accessed at any time. Thus, blended learning plays a role as an innovative solution to improve the quality of education, especially in the field of literacy.

However, the success of the implementation of blended learning also depends on the readiness of technology infrastructure, the active role of teachers as facilitators, and full support from schools and the government. Therefore, to ensure the sustainability of this program, greater investment is needed in the development of technological infrastructure and teacher training.

The results of this study make a significant contribution to the development of technology-based learning strategies at the elementary school level. Further research is suggested to explore the impact of blended learning on other aspects of learning, such as learning motivation, collaboration skills, and critical thinking skills, as well as to monitor its long-term effects on student competency development.

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