

IMPLEMENTATION OF THE MERDEKA CURRICULUM THROUGH THE APPLICATION OF THE PROJECT-BASED BLENDED LEARNING MODEL IN MATHEMATICS LEARNING

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Abstract

This study aims to determine the effect of the implementation of the project-based blended learning model on improving students' mathematics learning outcomes as the implementation of the independent curriculum in mathematics learning. The research method used is quasi-experimental which consists of an experimental class and a control class. The experimental class applied the project-based blended learning model in learning mathematics, and the control class did not use the project-based blended learning model in learning mathematics. The instrument used is the test of students' mathematics learning outcomes given before and after the implementation of learning. The data analysis used was descriptive statistical data analysis and inferential statistical data analysis which consisted of the normality test, homogeneity test, and independent sample t-test for hypothetical testing using the N-gain value. The results of the data analysis show that the significance obtained is $0.000 < 0.05$ or in other words, H_0 is rejected, so it can be concluded that there is a significant effect of applying the project-based blended learning model to improving students' mathematics learning outcomes.

Keywords: Merdeka Curriculum, Project-Based Blended Learning, Mathematics Learning

IMPLEMENTASI KURIKULUM MERDEKA MELALUI PENERAPAN MODEL PROJECT-BASED BLENDED LEARNING DALAM PEMBELAJARAN MATEMATIKA

Abstrak:

Penelitian ini bertujuan untuk mengetahui pengaruh implementasi kurikulum merdeka melalui penerapan model projec-based blended learning dalam pembelajaran matematika. Metode penelitian yang digunakan yaitu quasi eksperimen yang terdiri dari kelas ekperimen dan kelas kontrol. Kelas eksperimen diterapkan model project based blended learning dalam pembelajaran matematika, dan di kelas kontrol tanpa model project based blended learning dalam pembelajaran matematika. Instrumen yang digunakan yaitu tes hasil belajar matematika peserta didik yang diberikan pada saat sebelum dan setelah implementasi pembelajaran. Analisis data yang digunakan yaitu analisis data statistik deskriptif dan analisis data statistik

inferensial yang terdiri dari uji normalitas, uji homogenitas, dan uji independent sample t-test untuk pengujian hipotesis dengan menggunakan nilai N-gain. Hasil analisis data menunjukkan bahwa signifikansi yang diperoleh yaitu $0,000 < 0,05$ atau dengan kata lain H_0 ditolak, sehingga dapat disimpulkan bahwa terdapat pengaruh yang signifikan dari penerapan model project based blended learning terhadap peningkatan hasil belajar matematika peserta didik.

Kata Kunci: Kurikulum Merdeka, Project Based Blended Learning, Pembelajaran Matematika

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INTRODUCTION

The independent curriculum was established by the government as an effort to achieve the National Education goal, namely to form students with the values of the Pancasila Student Profile. Efforts are currently being made to implement the independent curriculum from PAUD to higher education with the hope that Indonesian education can produce the nation's next generation who will become lifelong learners by upholding the values of Pancasila within themselves. The implementation of an independent curriculum essentially provides an opportunity for education units to develop their curriculum to implement learning by taking into account the characteristics of students, the education unit, and the area where the education unit is located. This is intended so that students can get the opportunity and treatment according to their learning needs. In this case, the teacher acts as a facilitator who facilitates the needs of students, this is because each student has a different character, so all of them cannot be given the same treatment (Wahyuni, 2022).

The implementation of learning carried out in the independent curriculum begins with conducting a formative assessment at the beginning of learning so that teachers can design learning that truly suits the needs of students. The differences in abilities and characteristics of students who differ from one another provide challenges for teachers to be able to design learning that can accommodate the differences in characteristics and needs of these students. An independent curriculum is essentially an education that adapts to

the times and nature, where students have their interests and potential (Cholilah, Tatuwo, Rosdiana, & Fatirul, 2023).

Therefore, the implementation of learning that is carried out should also pay attention to developments in the times that are filled with technological advances, therefore one of the aspects that is also considered in the implementation of independent learning is digitalization. One of the learning implementations that can be used in implementing the independent curriculum is the project-based blended learning model.

The project-based learning model is a learning model related to focusing on meaningful questions and problems, problem-solving, decision-making, the process of searching from various sources, and collaboration between group members which will then produce work that will be presented (Hartini, 2017). It is hoped that the application of project-based learning will provide students with the opportunity to think, search for information, and solve the problems they face. Meanwhile, blended learning is a combination of face-to-face learning systems with IT-based learning (e-learning) by combining face-to-face and online elements that are integrated and ideal in implementation (Rachman, Sukrawan, & Rohendi, 2019).

Based on the results of observations in class VIII of SMP Negeri 5 Wonomulyo, it was found that students were less enthusiastic about participating in learning, there were still students who carried out other activities besides learning activities, including sleeping, telling stories with friends, and other activities. In addition, it was identified that the mathematics learning outcomes of students in class VIII were still relatively low. This is because the learning carried out has not allowed students to experiment, try to solve problems, and construct their knowledge. Based on the background of the problem, the formulation of the problem in this study is "Does the project-based blended learning model affect students' mathematics learning outcomes?"

According to Baron, Project Learning (PjBL) is a learning that provides opportunities for students to solve practical problems given through stimulus in learning (Niswara, Fita, & Untari, 2019). Other opinions state that the project-based learning model is a learning model that makes the project a goal and involves students in solving problems and tasks that have other meanings, allowing students to learn independently by constructing the knowledge they have and being able to produce works that have value and is realistic (Mayuni, Rati, & Putrini, 2019).

According to Thomas, the project-based learning model can also be interpreted as a learning model related to the centralization of meaningful questions and problems, problem-solving, decision-making, the process of seeking from various sources, and collaboration between group members which will then produce a work that will be presented (Hartini, 2017). In the application of project-based learning, students will be faced with a problem or it can also be in the form of a project then students are given the task to solve the problem given or by making a project that has been assigned then proceed with the stages of searching, investigating and finding themselves so that students can construct complete knowledge by using new ideas obtained from theories, concepts, and information obtained which has been developed into something new (Natty, Kristin, & Anugraheni, 2019). So that through the implementation of project-based learning will hone students' abilities to choose strategies, solve problems, and make conclusions which will have an impact on students' ability to solve problems encountered every day.

Blended learning is a strategy that can be used in carrying out learning that can improve critical thinking skills and optimize the use of information technology to improve learning outcomes (Ferdiansyah, Zulkifli, & Yakub, 2021). Blended learning is also a combination of direct teaching (face-to-face with online learning and being part of social interaction (Arifin & Abduh, 2021).

The benefits of implementing blended learning in learning include: (1) Learning activities are more flexible and time-efficient because they can be done in various places. (2) Make learning activities easier because students are more cheerful and save energy. (3) The budget for learning is more efficient because student activities usually use paper. Then, it is more economical because you don't have to pay fees to the learning location (Suci, Indrawan, Wijoyo, & Kurniawan, 2020).

One alternative that can be used to carry out learning in implementing the independent curriculum is to implement project-based learning combined with blended learning. Implementing the project-based learning model provides opportunities for students to learn independently. Previously conducted research found that the application of the blended learning model with the help of Google Classroom influenced improving students' mathematics learning outcomes (Yahya, Nurhidayah, Nurjannah, & Saharuddin, 2022).

Previous research found that the application of the project-based blended learning model to students resulted in increased cognitive and psychomotor abilities, and the implementation of learning was also classified as effective (Perangin-angin, Ambiyar, & Kusumaningrum, 2021). The current implementation of the independent curriculum focuses on implementing a student-centered learning method and training students' independence, namely through the project-based learning model (Fahlevi, 2022). The results of another research state that the application of a blended learning model based on project-based learning affects students' critical thinking abilities (Perangin-angin, Ambiyar, & Kusumaningrum, 2021). Meanwhile, other research found that on average students' creative thinking abilities were in a good category after implementing the project-based blended learning model in learning (Ayu, Tri, & Hartati, 2019).

METHODS

In this study the design used was quantitative which is quasi-experimental, this study aims to determine the increase in students' mathematics learning outcomes before and after the application of the project-based blended learning model. The research population was students at SMP Negeri 5 Wonomulyo. SMP Negeri 5 Wonomulyo was chosen randomly from various educational units in Polewali Mandar Regency which have implemented an independent curriculum independently. Meanwhile, samples were taken from class VIII students. Sampling was carried out using simple random sampling on students so that class VIII A students were selected as the experimental class and class VIII B as the control class.

The variables in this research consist of the independent variable and the dependent variable, the independent variable is the application of the project-based blended learning model, while the dependent variable is the student's mathematics learning outcomes based blended learning referred to in this research as a combination of project-based blended learning and blended learning models, students solve problems based on the tasks given and carry out learning in a mixture of synchronous and asynchronous.

The data in this study are students' mathematics learning outcomes obtained through students' mathematics learning outcomes tests given before and after the application of the project-based blended learning model. Data on students' mathematics learning outcomes were analyzed using SPSS 22. The research data were analyzed using descriptive statistical analysis techniques

and inferential statistical analysis. Descriptive statistical analysis is used to see a picture of data on improving students' mathematics learning outcomes. While inferential statistical analysis is used to test the research hypothesis, before testing, prerequisite tests are first carried out, namely the normality test and data homogeneity test with a significance level of test $\alpha = 0.05$. If the data is normal and homogeneous, then proceed with testing the hypothesis using the independent sample t-test with the conclusion criteria being if the $p\text{-value} \geq \alpha$ (0.05) then H_0 is accepted, otherwise if the $p\text{-value} < \alpha$ (0.05) then H_0 is rejected.

RESULTS AND DISCUSSION

The implementation of the independent curriculum in education units in carrying out learning begins with conducting an initial assessment, an initial assessment is carried out to find out the extent of the student's initial abilities and learning needs. Based on the initial assessment given, 3 categories of students' initial abilities were obtained, namely high, medium, and low. For students who have high initial abilities will be given more challenging assignments and the provision of assistance to students will be reduced. Students with moderate abilities will be given treatment, providing material, doing assignments, and so on. For students with low abilities, more assistance is given to students so that they can catch up on what students are experiencing.

The implementation of learning with the project-based blended learning model was carried out in the control class for 6 meetings with details of 1 pretest meeting, 4 model implementation meetings in learning, and 1 posttest meeting. The Pretest data of students in the experimental class and control class are presented in table 1 below.

Table 1. Pretest Result Data

Category	Score	Experiment Class		Control Class	
		Frecuency	Persentage	Frecuency	Persentage
Very High	81-100	-	-	-	-
High	61-80	-	-	-	-
Middle	41-60	2	8,33	-	-
Low	21-40	22	91,67	25	100
Very Low	0-20	-	-	-	-

Based on table 1, shows that the average pretest results of students in the control class and experimental class tend to be the same, this shows that it is proven that the initial abilities of students are homogeneous or that the two samples are in a homogeneous population. Meanwhile, data on students' post-test results after being treated with the project-based blended learning model in the experimental class and without the project-based blended learning model in the control class are presented in table 2.

Table 2. Posttest Result Data

Category	Score	Experiment Class		Control Class	
		Frecuency	Percentage	Frecuency	Percentage
Very High	81-100	5	20,83	2	8
High	61-80	19	79,17	23	92
Medium	41-60	-	-	-	-
Low	21-40	-	-	-	-
Very Low	0-20	-	-	-	-

Based on table 2, data shows that the average mathematics learning outcomes of students taught using project-based blended learning are higher than the learning outcomes of students taught without using the project-based blended learning model.

The increase in student learning outcomes scores before and after implementing the project-based blended learning model can be measured by calculating the gain value. The results of students' gain scores in the control class and experimental class are presented in table 3.

Table 3. N-gain Experiment Class and Control Class

Category	N-gain	Experiment Class		Control Class	
		Frecuency	Percentage	Frecuency	Percentage
High	$N - gain \geq 0,7$	17	70,83	10	41,67
Medium	$0,3 \leq N - gain < 0,7$	7	29,17	15	58,33
Low	$N - gain \leq 0,3$	-	-	-	-

Based on table 3 above, shows that the increase in scores of students' learning outcomes in the experimental class is higher than the score of increasing students' mathematics learning outcomes in the control class. The

next step is to test the hypothesis. The test requirements that need to be carried out before carrying out a hypothesis test are carrying out a normality test and an N-gain homogeneity test in the experimental class and the control class. The results of the normality test in the experimental class and control class are presented in table 4 below.

Table 4. N-gain Normality Test Results

Class	Frequency	Significance	Conclusion
Experimental Class	24	0,083	Normal Distribution
Control Class	25	0,200	Normal Distribution

Table 4 above proves that by using the Kolmogorov Smirnov normality test, it is found that the increase in the scores of students' mathematics learning outcomes in the experimental class and the control class are proven to be normally distributed, or in other words, the distribution of data on the increase in mathematics learning outcomes forms a normal curve. The next prerequisite test is to test the homogeneity of the data for the gain value data in the experimental class and in the control class.

The results of the homogeneity test show that the score data for increasing students' mathematics learning outcomes in the experimental class and the control class are homogeneous, or in other words, the data for increasing students' mathematics learning outcomes in the experimental class and in the control class come from the same population. Because the score for increasing students' mathematics learning outcomes is proven to be normal and homogeneous, it will be continued with hypothesis testing. The hypothesis testing used is the independent sample t-test. The results of testing the hypothesis obtained a p-value of $0.000 < 0.05$. This shows that H_0 is rejected, or in other words, the average gain value or the average score for improving students' mathematics learning outcomes in the experimental class is higher than the average score for improving students' mathematics learning outcomes in the control class. So it can be concluded that the application of project-based blended learning as an independent curriculum implementation affects improving students' mathematics learning outcomes.

This is also in line with previous research which stated that learning using project-based blended learning affects students' creative thinking

abilities (Suzanna, 2023). Other research also suggests that the application of blended learning and project-based learning can be an alternative to improve higher-order thinking skills (Eliyasni, Kenedi, & Sayer, 2019). The application of blended learning hones students' disciplinary, creative, and responsible abilities for the tasks given so that it leads to increased learning outcomes (Sulyantari, 2023). Meanwhile, project-based work makes students work on assignments based on the problems given so that it requires students to plan, solve problems, make decisions, investigate, and provide opportunities for students to work independently (Azizah & Wardani, 2019). So with a combination of project-based learning and blended learning models, you can improve students' mathematics learning outcomes.

CONCLUSION

The implementation of the independent curriculum through the application of project-based blended learning is carried out by providing different treatments according to students' learning needs by combining it with the project-based blended learning model. Implementation of the independent curriculum with a project-based blended learning model has been proven to improve student mathematics learning outcomes. Future research could focus on implementing project-based blended learning by considering learning styles in addition to paying attention to students' cognitive abilities.

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