

Project-Based Learning in the Merdeka Curriculum in Terms of Primary School Students' Learning Outcomes

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ABSTRACT

The purpose of this research is to support and strengthen the analysis of the effectiveness of the project-based learning model for application in elementary schools. This study employs the Systematic Literature Review (SLR) method. The sources of the research articles are databases from Google Scholar and CrossRef. Each article is analyzed based on its research findings. The results of the analysis indicate that project-based learning can increase students' learning motivation, enhance problem-solving skills, improve collaboration, and develop students' skills. It can be concluded that Project-Based Learning has been proven effective in improving elementary school students' learning outcomes, not only in terms of knowledge but also skills. Furthermore, the Project-Based Learning (PjBL) model can increase students' motivation, self-confidence, tolerance, cooperation, and understanding of the material, ultimately leading to a comprehensive improvement in students' learning outcomes. This learning model will continue to be recommended for educators in the learning process in accordance with the Merdeka curriculum.

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1. INTRODUCTION

Educating the nation is one of the ideals of Indonesian independence. To achieve this, an effective education system is necessary. The purpose of education is to improve and create quality human beings, as well as to build a dignified nation respected by other nations. This aligns with the function of national education as stated in Law No. 20 of 2003, article 3, which outlines the function of the national education system. The law aims to develop the abilities, character, and civilization of a dignified nation to educate the nation's life. It seeks to develop the potential of students to become individuals who believe in and fear Tuhan Yang Maha Esa, possess noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. The education system is closely related to the curriculum. The curriculum is a set of educational programs that have been designed and implemented to achieve educational goals, consisting of interrelated and mutually supportive

components (Fikri, et al., 2023). To improve the quality of education in a country, curriculum development is crucial. Curriculum development must start from a strong foundation, including aspects of need, relevance, effectiveness, continuity, and purpose.

The Merdeka Curriculum is a curriculum concept introduced by the Indonesian Ministry of Education and Culture. The Minister of Education and Culture, Nadiem Makarim, revised and established the Merdeka Curriculum as an enhancement of the 2013 Curriculum. The Merdeka Curriculum embraces the concept of "Merdeka Belajar" (Independent Learning), which differs from the 2013 Curriculum. According to Sherly et al. (2020), Merdeka Belajar entails granting autonomy to schools, teachers, and students to innovate, learn independently, and be creative, with this autonomy initiated by teachers as the driving force. A conducive and enjoyable learning environment is essential, given the numerous complaints from parents and students regarding the requirement to achieve minimum competency standards, particularly during the pandemic. The Merdeka Curriculum does not impose the necessity to meet minimum competency standards but emphasizes quality learning to cultivate quality students, who embody the characteristics of the Pancasila Student Profile and possess the competencies required to become Indonesian human resources capable of facing global challenges.

Curriculum changes inevitably modify or improve previously implemented teaching methods. Conventional methods that have been applied thus far have revealed learning barriers experienced by students. These barriers include monotonous teaching models that make students feel bored and disinterested in the subject matter, resulting in the failure to achieve learning success indicators. Research by Taupik and Fitria (2021) found that some schools still conduct learning activities that do not actively involve students in acquiring knowledge. The conventional teaching model is still in use, the utilization of educational media is not optimal, and there is a lack of cooperative learning activities that encourage students to construct their knowledge independently, mediated by their peers. This leads to difficulties for students in understanding the learning material, a lack of active participation in questioning, and passive acceptance of the information presented by the teacher. Students are not accustomed to collaborating or working in groups, sharing ideas, or engaging in discussions to acquire knowledge. Such learning approaches negatively impact student learning outcomes, resulting in low academic achievement.

Based on the survey results and field data collected by Sumarni and Manurung (2023), the low academic achievement of students is attributed to the teaching methods employed by teachers. This is evident from the lack of instructional models that actively involve students in the learning process. In light of this issue, teachers are expected to analyze students' needs, tailored to their environment, conditions, and learning objectives, when determining the methods or even the media used in the teaching process (Masliah & Nirmala, 2023). According to research by Saragih et al. (2023), many students still struggle with solving word problems in mathematics. Students face difficulties in solving mathematical word problems regardless of whether they have high, medium, or low abilities. The difficulties are not limited to writing mathematical models but extend to the entire problem-solving process and the final answers. This issue may also stem from students' low mathematical literacy skills, making it challenging for them to solve mathematical problems.

To address this problem, a different teaching method is needed. One method that aligns with the Merdeka Curriculum is Project Based Learning (PjBL). The Project Based Learning (PjBL) model is a student-centered instructional method. In this model, students are free to express their ideas and concepts through projects, which fosters creativity and active participation in task completion. Project Based Learning is an innovative instructional model with numerous advantages, including increasing student motivation, enhancing student performance, improving student skills, developing communication skills in collaborative workgroups, and providing students with opportunities to learn how to better organize projects (Puspitasari & Wahyuni, 2023).

Projects are conducted based on practical problems relevant to the curriculum topics. In this context, teachers play a crucial role in ensuring that this method aligns with and supports the smooth progress of the students' learning process. The Project Based Learning (PjBL) model is expected to be effective in

enhancing students' learning outcomes. Previous research conducted by Fiana, Relmasira, and Hardini (2019) found that the implementation of the PjBL model at the elementary school level could bring about positive changes in improving students' learning outcomes. The Project Based Learning strategy provides students with the opportunity to work independently and complete tasks or solve problems on their own (Rosmana et al., 2022).

This is also supported by other research findings, such as the study by Nurhadiyati et al. (2021), which showed that the Project Based Learning (PjBL) model influences the learning outcomes of fourth-grade elementary school students. By using project-based learning, students gain experience in organizing projects, allocating time, and managing resources such as equipment and materials to complete tasks. According to the study by Natty et al. (2019), there is an increase in creativity and learning outcomes through the implementation of the Project Based Learning model for third-grade elementary school students. This is evidenced by the increase in the average creativity scores of students from the initial or pre-cycle condition, which showed an average score of 52% in the low category, rising to 68% in the moderate category in cycle I, and in cycle II, the average score was 81% in the high category.

Research on the Project Based Learning model has also been conducted by Anwar et al. (2021), revealing that the project-based learning model significantly influences students' learning outcomes in geography education. Pretest results showed that the majority of students were in the categories of poor and below average, but after implementing Project Based Learning and conducting post-tests, the average scores exceeded the minimum passing grade criteria. Improved learning outcomes were also evidenced in Cahyadi et al.'s study (2019), which demonstrated that using the Project Based Learning model, coupled with experiments or trials in integrated thematic learning based on the 2013 curriculum, could enhance the learning outcomes of fifth-grade students at SDN Dukuh 02. One form of Project Based Learning involves using the literacy tree media. In Azizi et al.'s research (2023), the implementation of the Project Based Learning model assisted by the literacy tree media significantly increased the vocabulary of fifth-grade students. This model provides a different and engaging learning experience, thereby enhancing students' motivation and academic performance in expanding their vocabulary. Additionally, another media that can be utilized is creating mind maps. According to the findings of Faturrohman et al. (2023) at Menanggal Elementary School in Surabaya, creating mind maps has been found to help improve students' literacy understanding in writing descriptive essays because mind maps help students focus on what they will describe in their essays.

However, in the field, it has been found that there are challenges faced by teachers in implementing the Project Based Learning model. According to the research by Wardhan et al. (2023), the factors causing difficulties for teachers at Pagerjuran State Elementary School in implementing the Project Based Learning (PjBL) model include students' lack of high awareness and effort to explore sources, lack of focus, reluctance to ask questions, insufficient mastery of the material, students merely relying on teacher explanations, inadequate pouring of ideas, project task steps not being communicated well in advance, students not taking notes on important aspects of the learning activities, needing assistance from other classes, the need to understand each student's character, low collaboration among students, lack of understanding regarding the tasks being worked on, disruptions from other classes affecting learning concentration, students not understanding presentation systems, unclear voices during presentations, students appearing disappointed when given feedback on project work shortcomings, and the authentic assessment not being maximally implemented.

In addition, according to the research by Mufidah et al. (2020), it is shown that 63% of teachers still face difficulties in planning the Project Based Learning model, and 59% of teachers encounter challenges in implementing Project Based Learning. However, 91% of teachers state that this model can support student learning. The challenges faced by teachers in implementing the Project Based Learning model include limitations in infrastructure, difficulties in applying this model to different characteristics of students, struggles in adjusting themes, some parents' limited participation, and the need for cooperation with people around the students, as many children still require assistance. Based on the description above, there is a gap identified, where Project Based Learning is a suitable model according to the Merdeka

curriculum and is beneficial for implementation in learning, but there are still difficulties for teachers that can hinder its implementation. Therefore, further review is needed to assess whether the Project Based Learning model is effective and can have a significant impact, especially on student learning outcomes.

That descriptive proves that despite many difficulties and challenges faced by teachers, PjBL has a positive impact on student learning outcomes. This research aims to strengthen the analysis of the effectiveness of the PjBL model for implementation in schools. The goal is to achieve that, despite the difficulties and challenges, PjBL continues to be implemented while improvements are continuously made for ease of implementation.

2. METHOD

This research uses the Systematic Literature Review (SLR) method. This research uses three stages of systematic literature review (SLR), including: planning, conducting, and reporting. The planning stage is done first by determining the research topic then determining the criteria for finding journal articles. The criteria for articles in this study include: articles published in national journals from the period 2020 to 2023. Articles in the form of empirical research, namely quantitative, qualitative, classroom action research and experiment. The keyword used is project-based learning on the learning outcomes of elementary school students. The source of this research article is the google scholar database and crossreff downloaded on the Publish or Perish (PoP) application.

Furthermore, the conducting stage is to start searching for articles according to predetermined criteria and keywords. In searching for articles in the Publish or Perish (PoP) application, 100 articles from national journals were obtained. This article was used as the research population. After selection from the population, 18 articles were selected. The inclusion criteria applied in this study are sinta indexed journals, google scholar, or national journals with a clear ISSN. Then the reporting stage, this is the last stage, which is to present the results of the analysis and evaluation of the journal article review in descriptive form in accordance with the writing format.

3. RESULT AND DISCUSSION

The results of the research are outlined based on the SLR method from the results of the analysis of articles on the effectiveness of PjBL in the independent curriculum on student learning outcomes, seen from the improvement of student learning outcomes. From the results of the article analysis, 10 articles were obtained that examined the application of project-based learning (PjBL) in improving student learning outcomes at the elementary school level. The results of the article search are presented in the following table.

Tabel 1. Article Selection Result

| No | Title | Author and Year | Method | Result |
|----|---|--|---|---|
| 1 | Implementation of the PjBL model of 2-dimensional artwork material to improve grade 3 learning outcomes in elementary schools in the independent curriculum | Dila & Restian (2023) https://doi.org/10.23969/jp.v8i1.7861 | Classroom Action Research with quantitative and qualitative | There was an increase in the learning outcomes of grade students in elementary schools, in phase 1 research results with 60.71% completeness and phase 2 research increased by 92.85%. According to these results by applying the Project Based Learning model can improve the learning outcomes of grade III students on the material of 2-dimensional artworks. |
| 2 | Analysis of the application of PjBL in IPAS learning for grade 4 students with an | Puspitasari & Wahyuni (2023) https://doi.org/10.21070/ups.2007 | Qualitative | The PjBL model is appropriate to be applied in IPAS subjects with an independent curriculum and can increase student creativity. As evidenced by interview and |

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| | independent curriculum | | | observation data conducted by researchers, students look very active and enthusiastic in working on projects. |
| 3 | Implementation of the PjBL Model in the independent curriculum in improving concept understanding IPAS concept understanding in grade IV students | Rizkianida, et al. (2023) Jurnal Pendidikan Dan Konseling, 5(2), 1450–1456. | Qualitative | Students have increased understanding by using the project-based learning (PjBL) model seen from the cognitive tests conducted. Supported by interviews and student learning outcomes. |
| 4 | Effect of PjBL Model on student learning outcomes in elementary school | Nurhadiyati, et al. (2021) doi:10.31004/basicedu.v5i1.684. | Quasi Experiment | The Project Based Learning (PjBL) model affects the learning outcomes of fourth grade elementary school students because $t_{count} < t_{table}$ so that the initial hypothesis is rejected. |
| 5 | PjBL-Literacy in Improving Students' Mathematical Reasoning Abilities in Elementary School. | Abidin, et al. (2020) https://doi.org/10.32934/jmie.v4i1.170 | Experiment | Learning effectiveness includes minimum completion criteria, and learning completeness. Learning literacy projects have been effective in facilitating reasoning skills. It is because project-based learning literacy can present contextual material with literacy works made and invited to do the thinking process about the use of mathematical contexts in everyday life. Furthermore, students can connect mathematical material with real-life contexts and can make reasoning to interpret learning well. |
| 6 | The effect of the PjBL model on student learning outcomes in Integrated Thematic learning in Class IV SDN Gugus I, Batang Gasan District | Annisa & Yunisrul (2020) Journal of Basic Education, 3(2), 980–993. | Expeiment | There is a difference in student learning outcomes between experimental classes using the PjBL model compared to control classes using conventional learning. |
| 7 | The effect of the PjBL model on the learning outcomes of the perimeter and area of flat shapes in class IV elementary schools | Ariani & Zainil (2020) Jurnal Inovasi Pembelajaran SD, 8(5), 193–200. | Quasi Experiment | There is an effect of using the PjBL model on learning outcomes in the material of the perimeter and area of flat shapes of grade IV SDN cluster II students. |
| 8 | Implementation of the PjBL model to | Budi, et al. (2022) | Classroom Action | The quality of the student learning process in cycle I with an average of |

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| | improve the quality of the learning process student learning process on theme 4 subtheme 1 in grade III Ibtidaiyah Madrasah An-Nizham City Jambi | https://doi.org/10.36706/jisd.v9i1.17367 | Research with quantitative and qualitative | 65.48%, increased to 85.66% in cycle II. This means that the actions taken in cycle II in an effort to improve the quality of the learning process have met the target and reached the completeness criteria > 75%. |
| 9 | Application of PjBL model in learning short story writing grade VI SD Muhammadiyah 26 Surabaya | Adnan, et al. (2023) https://doi.org/10.36706/jisd.v10i1.20053 | Qualitative | The implementation of the PjBL model in learning short story writing is able to improve writing skills, critical and creative thinking skills of grade VI students in short story writing lessons. |
| 10 | Implementation of PjBL Model to improve learning outcomes learning outcomes of fifth grade students | Nurlatifah, et al. (2022) Journal of Innovation in Primary Education, 1(2), 99–106. | Classroom Action Research with quantitative and qualitative | Improved student learning outcomes from cycle 1 and cycle 2 by applying the PjBL learning model. |
| 11 | Application of Project Based Learning on Theme 3 Objects Around Me to Improve Creativity and Learning Outcomes of Grade III SD Negeri 4 Cindaga | Miftah, et al. (2024) Didaktika: Jurnal Kependidikan, 13(1), 219-230. https://jurnaldidaktika.org | Classroom Action Research | Learning outcomes and student creativity in class III SD Negeri 4 Cindaga increased. Project-based learning on thematic learning of Objects Around Me material in class III SD Negeri 4 Cindaga is also very suitable to be applied, because it is proven that students become more active and very enthusiastic about participating in learning which is also student-centered. |
| 12 | Project Based Learning Model to Improve Creative Thinking Ability and Science Learning Outcomes of Grade V Elementary School | Permana, et al. (2023) https://j-innovative.org/index.php/Innovative | Experiment with pretest-posttest nonequivalent control group design | There is a positive effect of Project Based Learning model on creative thinking ability and learning outcomes of fifth grade students. |
| 13 | Effectiveness of Project-Based Learning and Kumon Learning | Rohmah, R.S (2022) http://jurnal.anfa.co.id/index.php/seroja | Qualitative | Project-based learning is effective in improving students' understanding of mathematical concepts and their critical thinking skills. In addition, the |

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| | Model in Improving Mathematics Learning Outcomes in Elementary Students | | | implementation of the Kumon learning model with manipulative media provides positive results in improving students' mathematics learning outcomes. |
| 14 | Implementation of Project Based Learning Model to Improve Students' Learning Outcomes | Sahid, et al. (2024) https://doi.org/10.24929/lensa.v14i1.336 | Classroom Action Research consisting of 3 cycles | There was an increase in the percentage of learning activeness and the average learning outcomes of students with the application of project-based learning models. |
| 15 | Improving Mathematics Learning Outcomes Through Project Based Learning Model for Fourth Grade Students in Elementary School | Salwa, et al. (2023) https://doi.org/10.56393/sistemamong.v3i2.1812 | Classroom Action Research consisting of 2 cycles | The results showed a significant increase in students' mathematics learning outcomes after applying the Project Based Learning Model. |
| 16 | The Effectiveness of Problem Based Learning and Problem Posing Models in Improving Critical Thinking Ability of Elementary School Students | Sasmita & Harjono (2021) https://doi.org/10.31004/basicedu.v5i5.1313 | Quasi experiment design | The Problem Based Learning model is proven to be more effective in improving critical thinking skills in thematic learning in students than using the Problem Posing model. |
| 17 | Analysis of the Application of Project Based Learning Model and Problem Based Learning Models for Elementary School Learners | Setiawan, et al. (2022) https://doi.org/10.31004/basicedu.v6i6.4161 | Qualitative | Both PjBL and PBL learning models can increase the activeness of students in learning activities but when compared between the two models, the PjBL model is found to be more active in the process of learning activities and good from the cognitive learning outcomes of students. |
| 18 | Effectiveness of Project Based Learning Model on Social Studies Learning Outcomes Learning Social Studies Class IV | Dari, et al. (2021) https://doi.org/10.31004/innovative.v2i1.2845 | True Experimental Design | The use of project-based learning model is effective on social studies learning outcomes of grade IV SDN 83 Palembang. |

The results of the review analysis in the table above, show that the PjBL learning model is able to improve students' learning outcomes compared to conventional learning. Project Based Learning (PjBL) is a learning model that encourages students to develop and produce products or works both individually and in groups. The principle of this learning model emphasizes aspects of theoretical study and application. PjBL is in accordance with the objectives of the independent curriculum, namely student centered learning.

The characteristic of project-based learning is that there is collaboration between teachers and students, so that learning is not teacher-centered. So that by using this method, students are involved in choosing learning topics that attract attention and want to know more deeply can be done individually or in groups. By using this project learning, students feel directly involved so that learning is more meaningful and memorable for students, meaningful learning is easily stored in long-term memory. The knowledge gained from doing it yourself, makes students able to remember the experience, build a deeper understanding, foster curiosity, and get their own appreciation for the child.

Project-based learning is an innovative learning method that uses problems as the first step in the problem as the first step in collecting and integrating new knowledge based on his experience in real activities (Ardi, 2024). According to Hanifah & Indarini (2021) problem solving ability is education that focuses students on being able to create, examine, analyze, and be able to share solutions to problems related to modules in education. Therefore, problem-solving skills are needed because sharing a problem is like teaching material for students to better master learning at school. The application of PjBL positively affects student learning outcomes, because learning is more contextual and integrated with everyday life. Students not only remember facts, but are also able to apply that knowledge in practical projects, increasing retention and understanding of concepts (Fitriani, et al., 2023).

This is supported by research by Rizkianidaa, et al (2023), this learning model can help students understand the material in a different, interesting, and meaningful way. Learning by prioritizing practical activities rather than theory will make it easier for teachers and students to understand material concepts. Students will master the concept according to the real experience they have during the practical learning process. PjBL is considered effective in improving student learning outcomes characterized by increased understanding of concepts in students and an increase in cognitive scores. This model is appropriate and effective to help foster students' understanding independently and create student-centered learning in accordance with the principles of the independent curriculum.

In addition, this learning model requires students to design, solve problems, make decisions, conduct investigative activities, and provide opportunities for students to work independently. In relation to the learning experience, project activities are expected to increase student involvement in the learning process. One of the things that can be influenced is metacognition which plays an important role in problem solving. In addition, students will gain knowledge by communicating with their group to provide explanations or express opinions. This activity is the main characteristic of the PjBL learning model.

Based on the review of the articles above, it is known that the advantages of project-based learning include: a. Increase motivation, because in learning it goes through several processes that encourage students to think more creatively. b. Improve problem solving skills. c. Improve collaboration. The importance of group work in the project requires students to develop and practice communication skills. d. Improving resource management skills. Well-implemented project-based learning provides students with learning and practice in organizing projects, and making allocations of time and other resources such as supplies to complete tasks.

Disadvantages of project-based learning include: a. Each subject has its own difficulties, which cannot always be met in projects. (e.g. in religious studies) because students' activities are focused on work similar to the actual situation. b. It is difficult to choose the right project. c. Preparing the assignment is not an easy task. d. It is difficult to find appropriate reference sources. It is difficult to find appropriate reference sources. In addition to these shortcomings, according to Ramadianti (2021), in delivering learning materials with this project-based learning method, teachers are required to be

harder to use tools that can make it easier for students to understand the material so that in its implementation the teacher must be able to help students understand mathematics material through certain learning models, media and props. This is what makes not all teachers able to do it.

Although there are some obstacles and shortcomings to the implementation of Project Based Learning, based on the studies that have been conducted, it is proven that this PjBL model is effective to be applied and has a positive effect on improving student learning outcomes. According to Dila & Restian's research (2023), overall the results of the study can be used as a recommendation for all educators to apply the Project Based Learning model in learning activities to improve student learning outcomes. Not only learning outcomes in terms of knowledge but also skills. In addition, the Project Based Learning (PjBL) learning model will be able to increase motivation, self-confidence, tolerance, cooperation and also understanding of student material, so that it will lead to an increase in student learning outcomes as a whole (Nurlatifah., et al, 2022). So based on the explanation above, Project Based Learning is proven to be effective and recommended to continue to be applied in learning activities in schools and continue to make improvements and evaluations to minimize existing obstacles.

4. CONSLUSION

Based on the findings and discussion, it can be concluded that Project Based Learning is proven effective in improving the learning outcomes of elementary school students, not only learning outcomes in terms of knowledge but also skills. In addition, the Project Based Learning (PjBL) learning model will be able to increase motivation, self-confidence, tolerance, cooperation and also understanding of student material, so that it will lead to an increase in student learning outcomes as a whole. This learning model will continue to be used as a recommendation for educators in the learning process. This research strengthens the analysis of the effectiveness of the Project Based Learning model to continue to be applied in elementary schools and become one form of learning model in accordance with the Merdeka curriculum.

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