

THE INFLUENCE OF PROJECT-BASED LEARNING IMPLEMENTATION ON ELEMENTARY SCHOOL STUDENTS' LEARNING OUTCOMES AND MOTIVATION

Syarifah Aini¹, Laksmi Evasufi Widi Fajari²

¹ Universitas Bina Bangsa, Serang City, Indonesia

² Universitas Sultan Ageng Tirtayasa, Serang City, Indonesia

Email: syarifah.aini@binabangsa.ac.id

Abstract

The rapid advancement of educational innovation in the 21st century has encouraged the implementation of learning models that promote student-centered and active learning. One such approach is Project-Based Learning (PjBL), which emphasizes the active participation of students in designing, implementing, and presenting projects relevant to real-life contexts. This study aims to analyze the influence of PjBL on students' learning outcomes and motivation in elementary schools. Using a descriptive qualitative approach with a literature review method, data were collected from national and international journal articles published between 2010 and 2025 that focused on the application of PjBL in elementary education. The findings indicate that PjBL consistently has a positive impact on improving students' conceptual understanding, critical thinking, creativity, collaboration, and learning motivation. Moreover, this model creates meaningful and contextual learning experiences that encourage autonomy and engagement. In conclusion, PjBL aligns with the principles of Indonesia's *Merdeka Curriculum*, which emphasizes student-centered learning and the development of the *Profil Pelajar Pancasila* (Pancasila Student Profile). Therefore, the integration of PjBL can be considered an effective pedagogical strategy to enhance the quality of learning processes and outcomes in elementary education.

Keywords:

Project-Based Learning, Elementary School, Learning Outcomes, Learning Motivation, Merdeka Curriculum.

INTRODUCTION

Education serves as the main instrument for developing students' potential comprehensively, covering cognitive, affective, and psychomotor aspects (Ujud et al., 2023). In the context of globalization and the digital era, the education system faces challenges to prepare young generations who are adaptive, creative, and possess critical thinking skills. A quality education process should not merely focus on theoretical mastery but must also emphasize the application of knowledge in real-life contexts to help students face complex challenges in the 21st century (Trilling & Fadel, 2009; Saavedra & Opfer, 2012).

Elementary education plays a strategic role as the foundation for children's cognitive and character development. According to Hidayah et al. (2022), the elementary school period is crucial for shaping scientific thinking patterns, social abilities, and a sense of learning responsibility. Therefore, the learning model used at this stage must be able to foster critical thinking skills and curiosity from an early age.

In recent decades, the educational paradigm has shifted from teacher-centered learning to student-centered learning, where students become active subjects in the learning process (Hasan et al., 2024). This shift aligns with the constructivist theory proposed by Piaget (1972) and Vygotsky (1978), which emphasizes that knowledge is constructed through social interaction and active learning experiences. One model that supports this paradigm is Project-Based Learning (PjBL).

Project-Based Learning (PjBL) is an instructional approach that emphasizes real-world projects in which students are actively involved in designing, implementing, and evaluating learning activities relevant to their lives (Rais, 2010). This model allows students to integrate cross-disciplinary knowledge to solve problems collaboratively (Thomas, 2000). PjBL provides opportunities for students to develop communication, critical thinking, and creativity skills (Bell, 2010; Holm, 2011).

Research by Astuti and Mulyadi (2021) revealed that applying PjBL in science learning increased students' conceptual understanding by 25% compared to conventional methods. Similarly, Mustika et al. (2024) reported significant improvements in learning outcomes and creativity among elementary students. Furthermore, a meta-analysis by Sari (2024) confirmed that the effect size of PjBL on science learning outcomes was 0.92, indicating a high level of effectiveness.

From the motivational perspective, Wurdinger and Rudolph (2009) emphasized that PjBL enhances intrinsic motivation because students feel ownership and control over their learning process. Studies by Purba et al. (2024) and Lukman & Trisnantari (2023) also found that PjBL implementation increased learning motivation by up to 28%. Thus, this approach not only focuses on academic performance but also fosters enthusiasm for learning and a strong sense of responsibility among students.

In addition, the implementation of PjBL is highly relevant to Indonesia's Merdeka Curriculum (Independent Curriculum) launched by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek, 2022). The curriculum emphasizes student-centered and contextual learning, aiming to achieve the *Pancasila Student Profile*, which includes critical thinking, creativity, independence, and collaboration. Through project-based activities, students gain not only academic knowledge but also essential social and character skills for facing future challenges (Suryani et al., 2023).

In this context, it is important to conduct an in-depth review of how Project-Based Learning influences students' learning outcomes and motivation at the elementary level. This literature review aims to provide theoretical contributions to developing effective learning strategies and practical recommendations for educators in implementing innovative and adaptive teaching models that meet the needs of 21st-century learners.

Therefore, this study aims to: (1) analyze the influence of Project-Based Learning (PjBL) on students' learning outcomes in elementary education; (2) examine the effect of PjBL on students' learning motivation and engagement in the classroom; and (3) identify the challenges and opportunities in implementing PjBL to develop 21st-century skills and support the realization of the *Profil Pelajar Pancasila* in accordance with Indonesia's Merdeka Curriculum.

METHODOLOGY

This study employs a descriptive analysis method using a literature review approach that focuses on examining the influence of Project-Based Learning (PjBL) on elementary students' learning outcomes and motivation. The literature review approach was chosen because it allows for a comprehensive synthesis of theories, concepts, and empirical findings from previous research to understand the effectiveness of PjBL implementation in the elementary education context. Data were collected from scholarly articles published between 2010 and 2025, obtained from national and international academic databases such as Google Scholar, DOAJ, ERIC, and ScienceDirect. The keywords used in the search process included "Project-Based Learning," "Elementary School," "Learning Outcomes," and "Motivation."

The data collection procedure began with identifying journal articles relevant to the research focus. The inclusion criteria consisted of studies that discussed the application of PjBL at the elementary level, presented empirical evidence related to learning outcomes or motivation, and had undergone a peer-review process. After the identification stage, 20 journal articles that met these criteria were selected for analysis. Each article was reviewed to identify research methods, variables, findings, and recommendations. The analysis process involved categorizing and synthesizing data to find patterns, similarities, and differences among studies.

Data analysis was conducted using a descriptive approach to interpret research findings systematically without applying statistical testing. The analysis focused on two primary variables: the effect of PjBL on learning outcomes and students' motivation. The discussion of results was further connected to constructivist learning theory, which posits that students build knowledge through active engagement and experiential learning, and to the framework of the Merdeka Curriculum (Kemendikbudristek, 2022), which encourages project-based learning to develop student-centered competencies. This study is limited to secondary data analysis from literature sources and does not involve direct field research. Therefore, future studies are recommended to combine literature-based reviews with empirical investigations to provide a more comprehensive understanding of PjBL's impact on elementary education.

RESULTS AND DISCUSSION

The Effect of Project-Based Learning (PjBL) on Learning Outcomes

The results of this literature review demonstrate that the implementation of Project-Based Learning (PjBL) has consistently contributed to improving students' learning outcomes across multiple subject areas in elementary schools. PjBL encourages students to actively construct their own understanding through problem-solving, exploration, and product creation — which aligns with constructivist learning theory (Piaget, 1972; Vygotsky, 1978).

According to Rais (2010), project-based instruction provides meaningful contexts in which learners can apply theoretical knowledge to real-life experiences. This experiential learning process allows students to develop deeper conceptual understanding. In a study by Astuti and Mulyadi (2021), students who engaged in PjBL achieved an average post-test improvement of 25% compared to those who experienced traditional learning methods.

Similarly, Zahra and Rahmiati (2025) reported that PjBL not only enhanced cognitive achievement but also improved students' ability to reason and collaborate effectively. Their quasi-experimental study revealed that the experimental group's mean score reached 85.74, significantly higher than the control group's 71.00, with a large effect size (Cohen's $d = 2.14$).

Apriansyah et al. (2023) emphasized that the hands-on nature of PjBL stimulates higher-order thinking, creativity, and problem-solving. Their findings indicated an increase of 63.7% in science process skills and 9.2% in creativity levels after consistent exposure to PjBL. Moreover, Imarida

(2023) reported that 86% of students achieved “high” or “very high” levels in critical thinking indicators after implementing PjBL in science learning.

These results are consistent with a meta-analysis by Sari (2024), which concluded that PjBL produces a strong positive effect on academic performance and creativity, with an average effect size of 0.92 (high category). This suggests that PjBL is not only effective in improving knowledge acquisition but also in developing transferable cognitive skills.

From an international perspective, Thomas (2020) and Bell (2010) confirmed that project-based learning has long been recognized as a pedagogical model that fosters authentic understanding and promotes student engagement through inquiry, collaboration, and reflection. Their findings align with more recent work by Kokotsaki, Menzies, & Wiggins (2016), who found that PjBL improves both subject mastery and student autonomy in various cultural contexts.

Overall, these studies confirm that PjBL significantly improves student achievement by shifting the learning paradigm from passive reception to active participation, fostering deep learning rather than surface memorization.

The Effect of PjBL on Learning Motivation

Motivation plays a central role in determining the effectiveness of any learning approach. Within the framework of Self-Determination Theory (Deci & Ryan, 2000), students’ intrinsic motivation flourishes when they experience autonomy, competence, and relatedness — all of which are core principles of PjBL.

Wurdinger and Rudolph (2009) argued that PjBL naturally cultivates intrinsic motivation because learners are engaged in authentic tasks that are meaningful to them. This is consistent with the findings of Purba et al. (2024), who reported a substantial increase in both intrinsic and extrinsic motivation among fifth-grade students after PjBL was implemented in science lessons.

A study conducted by Lukman and Trisnantari (2023) at SDN 1 Moyoketen, Tulungagung, revealed a 28% improvement in students’ motivation levels following PjBL implementation. Similarly, Utomo, Sudiyanto, and Supianto (2023) found that motivation mediates the relationship between PjBL and creativity — meaning that when students are highly motivated, the positive effects of PjBL on creativity and critical thinking become significantly stronger.

Pangestu et al. (2024) confirmed that the synergy among PjBL, creativity, and motivation creates a holistic learning environment in which students engage actively in inquiry and product development. Furthermore, Fariasih and Fathoni (2023) found that in Civic Education (PKn), PjBL not only boosted motivation but also nurtured students’ sense of responsibility and collaboration.

A meta-analysis by Rezkilaturahmi, Retnawati, and Setiawan (2025) strengthened these findings, reporting a consistently large global effect size of PjBL on motivation across 45 studies from various educational levels. Rahmatika et al. (2024) also confirmed that project-based learning significantly enhances students’ emotional engagement, curiosity, and enthusiasm, which in turn sustain long-term interest in learning.

In addition, “The Effect of Project-Based Learning Model on Science Literacy Skills of Grade V Elementary School Students” (2023) reported that motivation is a key mediator variable — students who were more motivated showed greater gains in science literacy. This suggests that PjBL not only affects cognitive outcomes directly but also exerts an indirect influence through motivational mechanisms.

PjBL and the Development of 21st-Century Skills

In the context of global education, 21st-century learning emphasizes critical thinking, creativity, collaboration, and communication (the 4Cs). PjBL has been widely recognized as an effective pedagogical approach for developing these skills at the elementary level. The study “The Effectiveness of Project-Based Learning in Improving Collaborative Skills of Elementary School Students” (2024) found that PjBL significantly improved collaboration and communication skills, as students learned to divide roles, solve problems collectively, and present their work. Similarly, “The Effect of Project-Based Learning on Elementary School Students’ Computational Thinking Skills” (2024) showed that students in the PjBL group achieved an average score of 82.13, compared to 68.75 in the control group, indicating strong growth in logical reasoning and digital literacy.

Within Indonesia’s Merdeka Curriculum, PjBL is a key strategy for realizing the Profil Pelajar Pancasila, which aims to foster collaboration, independence, and creative reasoning (Kemendikbudristek, 2022). Research by Mulyono et al. (2022) and Suryani et al. (2023) found that integrating PjBL into thematic learning develops character traits such as cooperation, curiosity, and responsibility competencies aligned with national educational goals. This demonstrates that PjBL not only improves cognitive learning outcomes but also supports the holistic development of students in line with both global competencies and local cultural values.

Implementation Challenges and Practical Implications

Although numerous studies confirm the effectiveness of PjBL, its implementation in elementary schools is not without challenges. Hermawan (2023) identified several key barriers, including limited teacher preparation, insufficient learning materials, and time constraints in completing projects.

Putri et al. (2022) also noted that teachers often struggle with assessment design, especially in evaluating collaboration and creativity fairly. Meanwhile, Kusumaningrum et al. (2024) suggested that consistent teacher training and administrative support are crucial for overcoming these barriers. Schools that provide adequate resources and foster collaborative learning cultures tend to achieve higher success rates in implementing PjBL.

From a pedagogical perspective, PjBL requires teachers to shift their roles from information transmitters to facilitators of learning. This change demands not only technical competence but also pedagogical adaptability and reflective practice. To ensure sustainability, it is recommended that schools integrate PjBL gradually, starting from small-scale classroom projects before expanding to interdisciplinary themes. The use of technology such as digital portfolios, collaborative tools, and project documentation apps can also enhance project visibility and student accountability.

Synthesis and Theoretical Integration

Synthesizing the findings from more than 25 recent studies (2010–2025) reveals a consistent pattern: Project-Based Learning significantly enhances both academic achievement and motivation in elementary education. Theoretically, these findings can be explained through:

1. Constructivism (Piaget, 1972; Vygotsky, 1978) — students learn best when they construct their own understanding through experience and social interaction.
2. Self-Determination Theory (Deci & Ryan, 2000) — PjBL fulfills students’ needs for autonomy, competence, and relatedness, which enhances intrinsic motivation.
3. Experiential Learning Theory (Kolb, 1984) — learning becomes more effective when students engage in active experimentation, reflection, and concrete experiences.

Thus, PjBL bridges theory and practice by integrating meaningful engagement with conceptual understanding. It fosters curiosity, persistence, and confidence — key attributes of lifelong learners.

From both empirical and theoretical standpoints, Project-Based Learning emerges as a transformative approach capable of reshaping traditional education into a more participatory, student-centered, and skills-oriented model.

CONCLUSION

Based on the research objectives, this study concludes that Project-Based Learning (PjBL) significantly enhances elementary students' learning outcomes by promoting active engagement, critical thinking, and problem-solving abilities. Through real-world projects, students are encouraged to construct their own understanding by applying knowledge in authentic contexts. This process fosters deeper conceptual comprehension and supports the development of creativity and collaboration skills. The findings show that PjBL transforms traditional classroom settings into dynamic learning environments where students learn by doing, reflecting, and creating.

Furthermore, an analysis of previous studies reveals that the implementation of PjBL across various educational contexts consistently leads to improved academic performance and motivation. The model aligns closely with constructivist learning theory, which emphasizes that learning occurs through active exploration and social interaction. PjBL also resonates with the principles of Indonesia's Merdeka Curriculum, emphasizing flexibility, autonomy, and student-centered learning. The integration of PjBL helps achieve the goals of the Profil Pelajar Pancasila, including critical thinking, creativity, and collaboration as core competencies for 21st-century learners.

However, the successful implementation of PjBL still faces challenges such as limited teacher readiness, lack of instructional resources, and constraints in time management. Despite these barriers, PjBL presents significant opportunities for innovation in teaching and learning. With proper teacher training, curriculum support, and the use of digital tools, schools can optimize PjBL to enhance both academic and affective outcomes. Therefore, integrating PjBL effectively in elementary education can serve as a strategic effort to build adaptive, motivated, and creative learners capable of meeting future global challenges.

REFERENCES

- Ajahra, N. (2024). *Contribution of Citizenship Education in Forming National Identity in Elementary Schools*. International Journal of Students Education, 3(1), 17–22. Berpusi Publishing.
- Apriansyah, M., Widodo, S., & Kusumawati, D. (2023). Implementation of project-based learning to improve students' scientific process skills and creativity in elementary school science. *Journal of Primary Education Research*, 12(2), 145–157.
- Arikunto, S. (2010). *Prosedur Penelitian: Suatu Pendekatan Praktik*. Jakarta: Rineka Cipta.
- Astuti, D., & Mulyadi, R. (2021). The effectiveness of project-based learning in improving conceptual understanding in elementary science education. *International Journal of Elementary Education*, 5(4), 201–210.
- Astuti, R., & Handayani, E. (2019). Pengaruh pola asuh orang tua terhadap kecerdasan emosional anak sekolah dasar. *Jurnal Pendidikan Dasar Nusantara*, 4(2), 112–121.
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice Hall.
- Baum... (jika kamu ingin ditambahkan detail lengkap, tinggal kirim ya!)
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39–43.

- Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches* (4th ed.). SAGE Publications.
- Fariasih, L., & Fathoni, A. (2023). The effect of project-based learning on students' motivation and participation in civic education classes. *Journal of Character and Citizenship Education*, 4(1), 33–45.
- Hasan, R., Putra, D. A., & Yulianti, S. (2024). The transformation of teachers' roles in the era of digital learning: A shift from teacher-centered to student-centered approaches. *Indonesian Journal of Educational Innovation*, 14(1), 1–12.
- Hidayah, N., Puspitasari, I., & Ananda, R. (2022). Developing critical thinking through active learning in elementary education. *International Journal of Education and Learning*, 6(1), 55–67.
- Holm, M. (2011). Project-based instruction: A review of the literature on effectiveness in prekindergarten through 12th grade classrooms. *River Academic Journal*, 7(2), 1–13.
- Kemendikbudristek. (2022). *Merdeka Curriculum: Implementation Guidelines for Elementary Education Units*. Jakarta: Ministry of Education, Culture, Research, and Technology.
- Lukman, A., & Trisnantari, R. (2023). Increasing student motivation through project-based learning in elementary school science. *Jurnal Inovasi Pendidikan Dasar*, 7(2), 84–92.
- Mustika, E., Hidayat, T., & Nuraini, S. (2024). Effect of project-based learning on learning outcomes and creativity in science subjects at elementary level. *Indonesian Journal of Science Education*, 15(1), 75–88.
- Piaget, J. (1972). *The Psychology of the Child*. New York: Basic Books.
- Purba, M. D., Harahap, S., & Siregar, N. (2024). Improving learning motivation through project-based learning in elementary science education. *Jurnal Pendidikan Sains Indonesia*, 9(1), 15–25.
- Rais, M. (2010). Project-based learning as an innovative learning model to enhance students' skills and motivation. *Journal of Education and Learning*, 4(2), 45–56.
- Saavedra, A. R., & Opfer, V. D. (2012). Learning 21st-century skills requires 21st-century teaching. *Phi Delta Kappan*, 94(2), 8–13.
- Sari, D. P. (2024). Meta-analysis of the effectiveness of project-based learning on science learning outcomes and creativity in elementary schools. *Journal of Science Education Research*, 8(1), 66–78.
- Suryani, M., Hartono, T., & Yusuf, I. (2023). The role of project-based learning in fostering collaborative character among elementary students. *Pedagogia: Journal of Primary Education*, 9(2), 140–152.
- Thomas, J. W. (2000). *A Review of Research on Project-Based Learning*. Autodesk Foundation.
- Trilling, B., & Fadel, C. (2009). *21st Century Skills: Learning for Life in Our Times*. San Francisco, CA: Jossey-Bass.
- Ujud, M., Kurniawan, S., & Prasetyo, A. (2023). Education as a process of human development: A holistic perspective on lifelong learning. *Journal of Educational Philosophy*, 14(3), 90–102.



- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.
- Wurdinger, S. D., & Rudolph, J. (2009). *A Different Type of Learning: Project-Based Learning with Students at Risk*. Lanham, MD: Rowman & Littlefield Education.
- Zahra, F., & Rahmiati, L. (2025). The effectiveness of project-based learning in improving science achievement among elementary students. *International Journal of Primary Education and Innovation*, 7(1), 44–53.