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Implementation of Project Based Learning to Enhance Creativity in Elementary School Students

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ABSTRACT
The development of 21st-century education requires elementary schools to equip students with creative, critical, collaborative, and communicative thinking skills. Creativity is a crucial skill that must be developed early through learning strategies that provide space for students to experiment, explore, and produce tangible products. One effective approach is Project-Based Learning (PJBL), which places students at the center of learning and teachers as facilitators, emphasizing ongoing investigation, collaboration, and reflection. The purpose of this article is to analyze and describe the implementation of PJBL in enhancing elementary school students' creativity and to identify factors influencing its effectiveness. The method used is a literature review, examining scientific research, national and international journals, proceedings, and credible academic sources published between 2021 and 2025. The analysis is conducted through categorization, comparison, and synthesis of research findings to gain a comprehensive understanding of the concept, implementation strategies, and impacts on creativity, as well as challenges and necessary support. The analysis results show that PJBL significantly improves students' creativity, including fluency, flexibility, originality, and elaboration, through contextual, relevant, and challenging projects. PJBL also contributes to the development of collaborative skills, communication, and students' learning motivation. Despite facing obstacles such as limited facilities, time, and teacher competence, appropriate implementation strategies, school policy support, and ongoing training can optimize the effectiveness of this model. Overall, PJBL has proven to be a learning approach capable of stimulating creativity and 21st-century skills in elementary school students.

Keywords: *project based learning, creativity, students, elementary School, learning strategy*

INTRODUCTION

The development of 21st-century education requires elementary schools to equip students with creative, critical, collaborative, and communicative thinking skills as core competencies that will support their future success. Creativity is a crucial skill because it is related to the ability to generate new ideas, find alternative solutions, and build a more meaningful understanding of a concept (Shofiyah et al., 2024). In the context of elementary education, creativity cannot be taught solely through lectures or routine exercises it requires learning strategies that provide space for students to experiment, explore, and produce tangible products. In line with the Independent Curriculum, which emphasizes experiential learning, elementary schools are required to implement approaches that can stimulate creative potential from an early age (Farida et al., 2025). Therefore, selecting the right learning model is crucial to ensuring that the learning process can actively and meaningfully engage students.

One widely recommended model for developing student creativity is Project-Based Learning (PJBL), as it provides students with the opportunity to work independently or in groups to produce work relevant to real life. This model encourages students to engage in investigative, exploratory, and problem-solving activities, thereby fostering critical and creative thinking skills (Hermansyah et al., 2025). In PJBL, teachers no longer act as information centers but as facilitators who guide the learning process through guidance and prompting questions. Various studies have shown that well-designed projects can build intrinsic motivation while increasing students' sense of ownership of the learning process (Nikolaos et al., 2024). With its student centered approach, PJBL also aligns with the cognitive developmental characteristics of elementary school-aged children, who learn more effectively through concrete experiences and hands-on activities.

Previous research findings indicate that the implementation of project-based learning can significantly increase the creativity of elementary school students through the integration of challenging, collaborative, and context-relevant tasks. Fariza & Kusuma (2024) emphasized that active participation in projects makes students more courageous in proposing new ideas, experimenting, and trying innovative solutions while completing assignments. Sitepu (2025) showed that students involved in project-based learning (PJBL) experienced improvements in fluency, flexibility, originality, and elaboration, compared to students learning through conventional methods. A classroom action study (Lolotandung, 2023) also showed an increase in creativity demonstrated by students' ability to produce unique products such as planting media from used materials. Another study by Mentari & Rosiyanti (2024) proved that student creativity indicators increased by up to 35% after the implementation of PJBL in science learning. Overall, empirical evidence shows that PJBL has high effectiveness in creating a learning environment that encourages creativity in elementary school students.

In addition to enhancing creativity skills, project-based learning also contributes to the development of social skills, collaboration, and student motivation. Solissa et al (2024) found that student involvement in contextual projects not only improves conceptual understanding but also builds a sense of responsibility and the ability to work collaboratively in groups. This is in line with research by Maros et al (2023), which states that students involved in projects have higher motivation and interest in learning because they can relate the subject matter to real life. International research conducted by Chen et al (2022) shows that PJBL can develop creative thinking skills through design-based tasks that require students to create original products. Active student involvement in discussions, experiments, and reflection is an important factor that enriches the learning experience and strengthens creativity. Thus, project-based learning focuses not only on the final result but also on the learning process that encourages students to be more independent, creative, and collaborative.

Despite its many advantages, the implementation of PJBL in elementary schools is not without challenges that require serious attention. Hermansyah et al (2025) identified several obstacles, such as limited facilities, lack of teacher training, and time constraints, which make project implementation less than optimal. Another challenge arises from teachers' difficulty in selecting relevant project themes that can stimulate student creativity, especially in classes with large numbers of students. Some teachers are also still accustomed to conventional methods, requiring adaptation and a change in mindset to implement more open and flexible learning (Zahra & Masyithoh, 2024). Furthermore, evaluating student creativity is often problematic because it requires comprehensive instruments that are sensitive to the processes and products produced by students. These obstacles highlight the need for policy support, ongoing training, and improvements in teacher pedagogical competency for PJBL to be effectively implemented in elementary schools.

Amidst these challenges, the implementation of Project-Based Learning (PJBL) remains an urgent need due to its relevance to the demands of modern education and national curriculum policies. Farida et al (2025) demonstrated that the integration of PJBL into the Independent Curriculum (Kurikulum Merdeka) can create a more flexible, creative, and hands-on learning environment. Research by Puspita et al (2025) also confirmed that continuous improvement in project planning and implementation can encourage increased student creativity, leading to optimal learning outcomes. Theoretically, PJBL aligns with a constructivist pedagogical approach that positions students as knowledge builders through interactions with the learning environment. Therefore, strengthening teachers' capacity to design and facilitate projects is a key factor in optimizing project-based learning in elementary schools. With these empirical and theoretical foundations, research on the application of PJBL to enhance elementary school students'

creativity is crucial for enriching learning practices and providing more comprehensive recommendations for educators.

This article aims to analyze and describe the implementation of Project-Based Learning (PJBL) as a strategy to enhance creativity in elementary school students, while identifying factors that influence its effectiveness in the classroom. By synthesizing the findings of various previous studies, this article is expected to provide a comprehensive overview of how PJBL is able to stimulate aspects of creativity such as fluency, flexibility, originality, and elaboration, as well as how the role of teachers, the learning environment, and school support contribute to the success of this model. In addition, this article is expected to be a reference for elementary school teachers in designing project activities that are relevant, contextual, and interesting for students so that learning becomes more meaningful. Thus, this article is expected to not only enrich academic studies on PJBL but also provide practical recommendations to improve the quality of learning and the development of student creativity in elementary schools.

METHODOLOGY

The method used in this article is a literature review that focuses on collecting, analyzing, and synthesizing various studies related to the application of Project-Based Learning (PJBL) in enhancing the creativity of elementary school students. The data collection process was carried out by reviewing scientific articles, national and international journals, proceedings, and other trusted academic sources published between 2022 and 2025. Source selection was carried out purposively, namely by establishing certain criteria such as topic relevance, suitability to the elementary education context, and publication quality. Each article was analyzed to identify concepts, findings, implementation approaches, and indicators of creativity used in project-based learning. The analysis was carried out through a process of categorization and comparison to produce a deep understanding of general patterns and differences between studies.

Data from various sources were synthesized to obtain a comprehensive picture of the effectiveness of PJBL in enhancing elementary school students' creativity, while also identifying challenges and supporting factors for its implementation. The synthesis was conducted by examining the relationships between findings, linking theoretical approaches to learning practices, and interpreting the consistency of research findings. This process also involved a critical evaluation of the reviewed research methodologies, ensuring that the conclusions drawn are well-founded and scientifically sound. With this literature review approach, the article is expected to present a comprehensive analysis that not only describes the findings but also broadens understanding of the role of PJBL in developing elementary school students' creativity.

RESULT AND DISCUSSION

Project-Based Learning Concept

Project-Based Learning (PJBL) is a learning approach that emphasizes active student involvement in designing, implementing, and evaluating projects relevant to real life (Nikolaos et al., 2024). This model places students at the center of learning activities, encouraging them to think critically, creatively, and collaboratively. Theoretically, PJBL is rooted in constructivism, which emphasizes that knowledge is built through experience and interaction with the environment, not simply transferred by teachers (Markula & Aksela, 2022). In the context of elementary education, this argument is particularly relevant because children learn more effectively through concrete experiences and activities that challenge their ability to experiment and try out various ideas (Shofiyah et al., 2024).

According to Yuwono (2022), project-based learning is a learning model that provides students with opportunities to create works, both individually and in groups. The process standards explain that to develop students' abilities to produce contextual products, the use of a project-based approach is highly recommended. Through project-based learning (PJBL), students are actively involved in producing meaningful work that relates to real-world problems in their environment. This approach provides hands-on learning experiences and encourages a learning process that focuses not only on knowledge but also on its application in everyday life.

The main principles of PJBL include the use of provocative questions, student engagement in in depth investigations, group collaboration, and ongoing reflection on the project process and outcomes (Hermansyah et al., 2025). With these principles, students not only understand the subject matter theoretically but also relate it to real-world contexts, making learning meaningful. This aligns with the Independent Curriculum, which emphasizes experiential learning and contextual projects to stimulate student creativity. PJBL allows students to explore various solutions, express new ideas, and produce real products that are relevant to their needs (Farida et al., 2025).

The development of creativity through PJBL has been widely studied. Creativity encompasses fluency, flexibility, originality, and idea elaboration (Sitepu, 2025). PJBL provides space for students to express these four aspects through real-life activities that require problem-solving, collaboration, and exploration. Active participation in projects fosters students' confidence to experiment and try innovative ideas, thereby enhancing creativity and learning motivation (Fariza & Kusuma, 2024). Empirical evidence demonstrates the effectiveness of PJBL in elementary education. Research by Lolotandung (2023) found that students were able to produce innovative products, such as planting media from used materials, which indicates the development of creativity through fluency, flexibility, and originality. Meanwhile, Mentari & Rosiyanti

(2024) reported an increase in creativity indicators of up to 35% after implementing PJBL in science learning. Overall, PJBL provides meaningful learning experiences, stimulates creativity, and equips students with 21st-century skills that are important for their future (Nikolaos et al., 2024).

Project-Based Learning Implementation Strategy in Elementary Schools

Implementing PJBL in elementary schools requires careful planning so that the project can stimulate students' creativity and critical thinking skills (Shofiyah et al., 2024). The initial stage includes selecting a project theme relevant to students' daily lives and the subject matter. A contextual theme increases learning motivation and provides real meaning, thus encouraging students to be more actively involved (Farida et al., 2025). Once the theme is determined, the teacher and students plan the project activities and establish objectives and steps for completion and assign tasks if the project is carried out in groups (Hermansyah et al., 2025). Careful planning helps students understand the workflow, fosters responsibility, and fosters time management.

Project implementation is the core stage of PJBL. Students conduct investigations and experiments and develop ideas according to the project plan (Nikolaos et al., 2024). The teacher acts as a facilitator, providing direction, prompting questions, and offering guidance when students encounter difficulties. The emphasis on exploration, experimentation, and reflection encourages students to try various alternative solutions and develops creative thinking skills (Markula & Aksela, 2022). Furthermore, students learn to work collaboratively in groups, respect the opinions of their peers, and combine ideas to produce original and useful products (Solissa et al., 2024).

Assessment in PJBL emphasizes both process and product aspects. Teachers can use assessment rubrics that encompass creativity, collaboration, problem-solving, and communication skills (Taliak et al., 2024). Observations, journals, portfolios, and project presentations are important instruments for holistically assessing student achievement. Process-focused assessments encourage students to think critically, experiment with innovation, and learn the consequences of each decision they make (Fariza & Kusuma, 2024).

PJBL also adapts to the characteristics of elementary school-aged children, who learn more effectively through concrete experiences, hands-on experiments, and fun activities (Shofiyah et al., 2024). Group collaboration fosters social and communication skills, while project reflection and presentations strengthen systematic and evaluative thinking skills (Mentari & Rosiyanti, 2024). With the right strategies, PJBL creates active, creative, and meaningful learning for elementary school students (Hermansyah et al., 2025).

Project-based learning has several characteristics that emphasize active student involvement in the learning process. This model requires students to make decisions regarding the project framework while addressing the problems or challenges presented. To solve these problems, students design appropriate solution steps and collaborate in gathering and organizing the necessary information. Throughout the process, continuous evaluation is carried out, accompanied by periodic reflection activities so that students can assess their progress and learning experiences. The final project results are then assessed qualitatively to determine the quality of the product, while the learning environment is created to be flexible, tolerant of errors, and open to change so that students feel safe to experiment and develop their creativity (Yuwono, 2022).

The implementation procedures for Project-Based Learning (PJBL) are designed to ensure that learning activities are systematic, directed, and provide meaningful learning experiences for students. Each stage in this procedure is interconnected and serves to guide students from understanding the problem to planning solutions to producing a product relevant to real life (Benlaghrissi & Ouahidi, 2024). Through a series of structured steps, Project-Based Learning (PJBL) not only encourages students to be active and creative but also fosters critical, collaborative, and reflective thinking skills. By understanding each implementation stage, teachers can implement PJBL effectively, ensuring optimal achievement of learning objectives (Yuwono, 2022). The following figure shows the steps for implementing project-based learning:

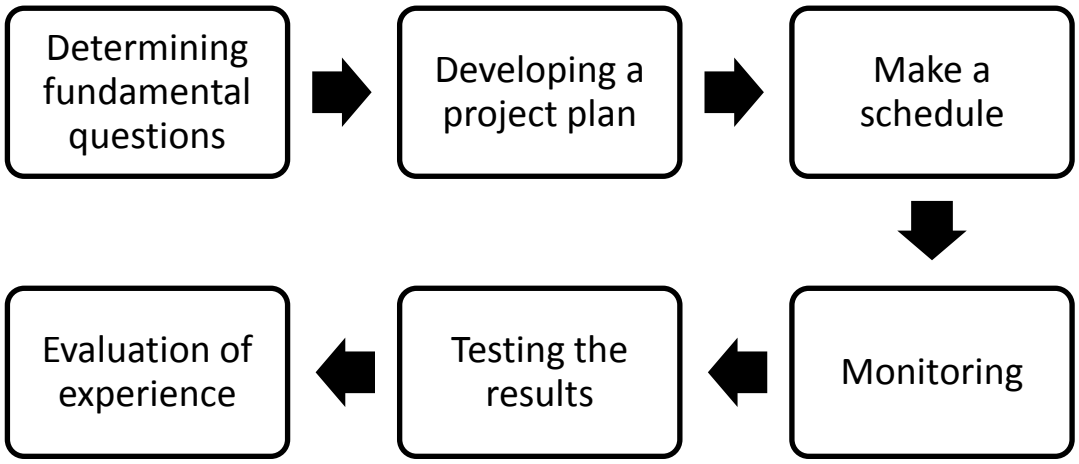

Figure 1. Project-based learning steps
Source: Yuwono (2022)

Start With the Essential Question

The initial stage of PJBL begins with identifying an essential question that will form the basis of the project. This question should be challenging, relevant to the real world, and able to spark students' curiosity. The chosen topic should reflect a real-life problem that is close to students' lives, encouraging them to conduct in-depth investigations. The essential question serves as the main direction that will guide the entire learning process and help students understand the purpose of the project they will be working on.

Design a Plan for the Project

At this stage, teachers and students work collaboratively to design a project plan. Student involvement in the planning process gives them a sense of ownership of the project, increasing their motivation to learn. Project planning includes establishing rules to follow, selecting activities that support the resolution of essential questions, integrating relevant subjects, and identifying appropriate tools and materials. With careful planning, students have clear guidelines for implementing the project.

Create a Schedule

Teachers and students work together to create a project schedule to ensure a focused and systematic work process. Activities at this stage include creating a timeline for project completion, setting deadlines, encouraging students to develop new strategies, and guiding students who take steps that deviate from the project's objectives. Teachers also ask students to justify their chosen strategies or methods. Through effective scheduling, students learn to manage their time, prioritize, and work effectively.

Monitor the Students and the Progress of the Project

Monitoring is carried out by the teacher while students are completing the project. The teacher acts as a mentor, facilitating students' needs, providing guidance, and helping them overcome any obstacles that arise. The monitoring process ensures that students stay on track and receive the necessary guidance. To facilitate monitoring, teachers can use an assessment rubric or observation sheet that records important activities during the project.

Assess the Outcome

Assessments are conducted to determine the extent to which students have achieved the learning objectives and established competency standards. These assessments assess not only the final product of a project but also the process students went through in completing it. Through assessments, teachers can

evaluate individual progress, provide constructive feedback, and determine future learning strategies. Assessments also help students understand the quality of their work and areas for improvement.

Evaluate the Experience

In the final stage, the teacher and students reflect on the entire project process. Reflection can be conducted individually or in groups and aims to reveal the experiences, difficulties, and lessons learned during the project. The teacher and students discuss the strengths and weaknesses of the learning process, allowing them to formulate improvements for the next project. This reflection also allows for the emergence of new inquiries that can serve as the basis for future projects or learning.

The Influence of PJBL on the Creativity of Elementary School Students

The implementation of PJBL has been shown to have a positive impact on elementary school students' creativity, including fluency, flexibility, originality, and idea elaboration (Sitepu, 2025). Fluency reflects the ability to generate multiple ideas, flexibility demonstrates the ability to think from multiple perspectives, originality emphasizes unique ideas, and elaboration is the ability to develop ideas into more detailed forms. PJBL allows students to express these four aspects through real-world projects that require problem-solving, collaboration, and experimentation (Shofiyah et al., 2024).

One of the main mechanisms by which PJBL enhances creativity is through exploration and experimentation. Students try various approaches to completing projects, thus enhancing their flexible thinking skills (Chen et al., 2022). Active participation in projects fosters students' confidence and courage to put forward new ideas, which in turn increases originality. Furthermore, contextual projects increase students' intrinsic motivation because they perceive their work as having real value (Fariza & Kusuma, 2024).

Group collaboration is a crucial factor in developing creativity. Interaction with peers allows students to appreciate other perspectives, discuss ideas, and combine ideas to produce better products (Solissa et al., 2024). Reflection and presentation of project results add a creative dimension, as students are encouraged to evaluate the process, refine ideas, and systematically construct arguments Nikolaos et al (2024). Research by Chen et al (2022) found that students involved in design-based projects improved their original thinking, flexibility, and problem-solving skills. Research (Farrow et al., 2024) emphasized that students' active involvement in experiments and discussions enriches the learning experience and strengthens creativity. Thus, PJBL creates an optimal learning environment for developing elementary school students' creativity while equipping them with 21st-century skills.

Challenges, Support, and Recommendations for PJBL Implementation in Elementary Schools

The implementation of PJBL in elementary schools faces various challenges, including limited facilities and infrastructure, teacher competency, and limited implementation time (Hermansyah et al., 2025). Some teachers are still accustomed to conventional methods, requiring training to develop skills in project design, student facilitation, and comprehensive creativity assessment (Zahra & Masyithoh, 2024). Time constraints within the curriculum also pose a barrier, as projects require longer duration than lectures or routine exercises (Farida et al., 2025).

School support and educational policies are key to the success of PJBL. Continuous training, provision of resources, and administrative support help teachers prepare for optimal PJBL implementation (Nxasana et al., 2023). The use of technology as an aid, such as design applications and interactive media, can enrich the learning experience and facilitate project implementation (Yue et al., 2024). Collaboration with parents and the community can also add a concrete context to student projects (Hanik et al., 2022).

Practical recommendations include realistic and relevant project planning and a focus on collaboration, reflection, and ongoing evaluation (Taliak et al., 2024). Teachers need to develop assessment rubrics that emphasize creativity, collaboration, and problem-solving so that students understand the project's overall success criteria (Fariza & Kusuma, 2024). Challenging yet enjoyable projects enhance students' intrinsic motivation, build responsibility, and encourage the courage to experiment. With the right implementation strategies, PJBL not only enhances creativity but also critical thinking, collaborative learning, and communication skills in elementary school students (Hermansyah et al., 2025). Therefore, challenges can be overcome through policy support, teacher training, adequate resources, and thorough project planning. PJBL creates an active, creative, and meaningful learning environment while equipping students with 21st-century skills essential for their future.

The success of PJBL is also greatly influenced by teachers' ability to create an open learning culture and value the process (Yuwono, 2022). A learning environment that allows students to try, fail, and improve will foster self-confidence and the courage to think outside the box (Jeong, 2025). Teachers need to develop supportive communication, provide constructive feedback, and encourage students to engage in ongoing self-reflection. When a positive classroom culture is established, students will be more free to experiment and demonstrate their creative potential at every stage of a project (Hermansyah et al., 2025).

Overall, the implementation of PJBL in elementary schools is not simply a learning strategy but a comprehensive approach that positions students as active learning agents. By combining real-life experiences, collaboration, exploration, and reflection, PJBL is able to create deep and meaningful learning experiences. Therefore, strengthening teacher competency, supporting school policies, and utilizing technology and a variety of learning resources are key factors in ensuring the optimal implementation of PJBL. If implemented well, PJBL not only enhances student creativity but also shapes a generation that is adaptive, innovative, and ready to face future challenges.

CONCLUSION

The implementation of Project-Based Learning (PBL) in elementary schools has proven effective in enhancing student creativity through the development of fluency, flexibility, originality, and idea elaboration. This model places students at the center of the learning process, encouraging them to think critically, experiment, and collaborate in groups to produce tangible products relevant to everyday life. With PBL principles that include provocative questions, in-depth investigation, continuous reflection, and collaboration, students not only understand the material theoretically but are also able to relate it to real-life contexts, making learning meaningful and intrinsically motivating. However, the implementation of PBL also faces various challenges, such as limited resources, time, and teacher competency in designing projects and assessing creativity comprehensively. Support from school policies, ongoing training, and the use of technology and creative learning resources are important factors in overcoming these obstacles. With the right implementation strategy, PBL not only enhances creativity but also equips students with 21st-century skills essential for their academic and social development.

To optimize the implementation of PJBL in elementary schools, it is recommended that teachers receive ongoing training on designing and facilitating creative projects, including process and product assessment methods that are sensitive to student creativity. Schools need to provide adequate facilities and infrastructure and utilize technology to support project activities. Furthermore, project themes should be relevant to students' lives and learning contexts to maintain high student motivation and participation. Finally, collaboration between teachers, students, parents, and the community needs to be strengthened to create a holistic learning environment, stimulate creativity, and optimally develop 21st-century skills.

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