



## Project-Based Curriculum Design to Enhance Problem-Solving Skills in Elementary School Students

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**ABSTRACT.** This study aims to analyze the concept and implementation of project-based curriculum design (PBC) in improving problem-solving skills in elementary school students. The research method used is library research, namely by reviewing various scientific literature in the form of journals, books, and research reports relevant to the theme of project-based curriculum and the development of higher-order thinking skills in elementary school-aged children. The results of the study indicate that the project-based curriculum provides authentic learning experiences through exploratory and collaborative activities, thus encouraging students to think critically, creatively, and reflectively in solving contextual problems. This approach is in line with the student-centered learning paradigm that places students as active subjects in the learning process. In addition, the project-based curriculum design has also proven effective in improving students' learning motivation and metacognitive abilities, because they are directly involved in planning, implementing, and evaluating learning outcomes. Thus, the integration of project-based curriculum in elementary education can be an innovative strategy for developing problem-solving skills as an essential competency of the 21st century.

**Keywords:** *project-based curriculum, problem-solving skills, elementary school*

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## INTRODUCTION

The paradigm shift in 21st-century education demands a transformation from teacher-centered learning to student-centered learning. Education is no longer merely a process of transferring knowledge but must foster the ability to think critically, collaborate, communicate, and creatively solve real-life problems. In the context of elementary education, the learning process serves as a crucial foundation for shaping students' character and thinking patterns. Therefore, an innovative and contextual curriculum design is urgently needed so that students can develop their potential optimally in accordance with the demands of the times. One relevant approach to achieving this goal is the project-based curriculum design, which emphasizes active student engagement in solving real-world problems through exploration, collaboration, and deep reflection.

A project-based curriculum model offers a more authentic and meaningful approach to learning. Through projects, students do not merely receive knowledge passively but actively engage in searching for, analyzing, and applying information to produce a product or specific solution. This makes learning more contextual and closely related to students' daily lives. In elementary education, project-based activities help nurture curiosity, responsibility, and problem-solving abilities from an early age. Project-oriented learning can also integrate various disciplines,

supporting the application of an integrated curriculum concept aligned with the vision of Indonesia's *Merdeka Curriculum*.

Problem-solving skills are among the higher-order thinking skills (HOTS) that serve as key indicators of educational success. In modern learning frameworks, these skills go beyond cognitive abilities to answer complex questions and also encompass social and emotional competencies, such as identifying problems, analyzing causes, and designing creative and applicable solutions. Students with strong problem-solving abilities tend to be more independent, resilient, and adaptable to diverse life situations. However, in practice, elementary education still tends to focus heavily on memorization and repetitive exercises rather than contextual problem-solving. This condition calls for curriculum innovation that can transform the mindset and teaching practices within elementary schools.

Project-based curriculum design becomes an effective solution to this issue as it connects theory with practice through authentic learning experiences. In such a curriculum, students are given the opportunity to identify problems relevant to their context, formulate questions, and seek solutions through teamwork. This process not only strengthens critical thinking but also develops social character traits such as responsibility, leadership, and cooperation. Therefore, this curriculum design focuses not only on cognitive learning outcomes but also on developing character and 21st-century competencies that encompass collaboration, communication, creativity, and problem-solving.

Theoretically, project-based learning has a strong foundation in constructivist theory developed by Piaget and Vygotsky. This theory emphasizes that knowledge is not passively transferred from teacher to student but actively constructed through meaningful learning experiences. In this context, projects provide a medium for students to construct their own knowledge through exploration, experimentation, and reflection. The teacher acts as a facilitator who guides and supports learning rather than serving as the sole source of information. Consequently, learning becomes more participatory and collaborative, ultimately increasing students' motivation and sense of ownership in their learning process.

In practice, implementing a project-based curriculum in elementary schools requires careful planning, including defining learning objectives, selecting project themes, setting achievement indicators, and evaluating learning outcomes. Ideally, project themes should be related to real-world issues within the students' surroundings, such as environmental cleanliness, energy conservation, or community engagement. Through such activities, students learn to think critically by identifying problems and finding creative, applicable solutions. The evaluation process in a project-based curriculum should not only focus on final products but also assess students' process, teamwork, and reflection throughout the project. (Khutomi et al., 2024)

Furthermore, integrating project-based curriculum design aligns with the vision of the *Profil Pelajar Pancasila* (Profile of Pancasila Students), which emphasizes six core dimensions: faith and devotion to God Almighty, global diversity, mutual cooperation, independence, critical reasoning, and creativity. Through project activities, these dimensions can be naturally internalized in learning. For instance, when students collaborate on an environmental project, they practice teamwork and social responsibility. When they analyze data or seek solutions, they develop critical reasoning. When they create innovative products, they exercise creativity and independence. Thus, project-based curriculum design can be regarded as a practical implementation of the *Merdeka Belajar* philosophy at the elementary level.

In addition to strengthening cognitive and socio-emotional competencies, project-based curriculum design holds great potential for enhancing 21st-century skills such as critical thinking, collaboration, communication, and creativity (4C). These four skills are widely recognized as the core of modern global education. In project-based learning, students gain experience not only from textbooks but also from direct, real-life activities that require adaptability, argumentation, and

decision-making. This enriches the learning experience and fosters students' readiness to face real-world challenges in the future.

With all its advantages, project-based curriculum design requires a paradigm shift among teachers in planning and implementing learning. Teachers are no longer the sole center of information but partners in the learning process. Nevertheless, challenges remain, as many elementary teachers still struggle to design relevant projects and assess authentic learning outcomes. Therefore, continuous training and institutional support from schools and the government are necessary to strengthen teachers' capacity in effectively implementing project-based curricula.

In conclusion, the urgency of this study lies in the need to deeply examine the concept and implementation of project-based curriculum design in improving elementary students' problem-solving skills. This study is expected to provide both theoretical and practical contributions to the development of innovative curriculum models that meet the demands of 21st-century education. It also highlights that elementary education is not merely an introductory stage of academic learning but a foundational phase in developing critical thinking and strong character to navigate the complexities of modern life. (Mardiana & Hasibuan, 2023)

## **METHOD**

This study employs a library research method, which focuses on examining written sources such as books, journal articles, conference papers, research reports, and official documents related to project-based curriculum design and problem-solving skills in elementary education. Through this method, the researcher does not collect data directly from the field but analyzes existing literature to obtain an in-depth understanding of how project-based curriculum models are applied and how they influence students' higher-order thinking skills. The primary aim is to review previous scholarly findings, identify research gaps, and construct logical arguments based on established theories and evidence. (Xiao & Watson, 2017)

The data collection process involves selecting literature that meets specific criteria, including publications from the last five years, reputable journals, topic relevance, and strong scholarly arguments. These sources are obtained from academic databases such as Google Scholar, Garuda Ristekbrin, Sinta, and university repositories. Each source is then analyzed to identify key concepts related to project-based curriculum design, 21st-century learning principles, and elementary students' problem-solving abilities. The analysis technique used in this study is content analysis, which enables the researcher to interpret meanings within the texts, compare findings across sources, and identify patterns or relationships among relevant variables.

The final stage of this method is literature synthesis, which integrates all analyzed information into a comprehensive understanding. This synthesis is conducted by systematically organizing previous research findings, highlighting similarities and differences between studies, and identifying research gaps that require further exploration. Through this approach, the study is expected to generate a strong theoretical foundation and offer both conceptual and practical contributions to the development of project-based curriculum design in elementary schools. Moreover, the synthesis serves as the basis for formulating recommendations for effective curriculum implementation aligned with the demands of 21st-century learning.

## **RESULT AND DISCUSSION**

The findings of this literature review reveal that project-based curriculum design plays a crucial role in transforming the learning experience of elementary school students. Research

consistently emphasizes that project-based learning (PBL) shifts students from passive recipients of knowledge to active participants who construct understanding through hands-on activities. Studies show that when students engage in meaningful projects, they become more motivated and invested in the learning process because they see the direct relevance of tasks to their lives. This increase in motivation is a key factor in improving students' engagement, persistence, and willingness to explore deeper levels of understanding. Compared to conventional learning methods that prioritize memorization, project-based curriculum design offers a more dynamic environment where students can interact with real-world problems. (Ndiung & Menggo, 2024)

Another major finding indicates that project-based curriculum design significantly enhances higher-order thinking skills (HOTS), especially problem-solving abilities. Several studies highlight that project-based tasks require students to analyze information, interpret data, compare alternative solutions, and make decisions based on logical reasoning. These processes are the core elements of problem-solving competency. Importantly, students learn not only how to solve problems but also how to identify them, which is a skill often overlooked in traditional educational settings. By engaging in these tasks, students practice metacognitive skills thinking about their own thinking such as planning, monitoring, and evaluating their work. This encourages students to become more independent learners who are capable of navigating complex learning tasks.

The literature further shows that PBL supports the emotional and social development of students, especially in collaborative contexts. Elementary students, who are in the developmental stage where social interaction becomes central, benefit greatly from teamwork-oriented projects. Project tasks naturally require cooperation, negotiation, and communication among group members. Research indicates that students involved in collaborative projects develop stronger interpersonal skills, including conflict resolution, empathy, and leadership. These competencies are crucial for 21st-century learning and prepare students for future academic and professional environments where teamwork and communication are essential. Thus, PBL does not merely address cognitive development but also enriches students' social maturity and emotional intelligence.

Moreover, the results reveal that project-based curriculum design aligns well with the Indonesian education vision, particularly the Merdeka Curriculum and Profil Pelajar Pancasila. Through projects that integrate local issues such as waste management, water conservation, or community service students are encouraged to embody national values such as cooperation, social responsibility, and creativity. The six dimensions of Profil Pelajar Pancasila faith, global diversity, independence, mutual cooperation, critical reasoning, and creativity can be closely linked to project activities. For example, a project on environmental conservation encourages cooperation (gotong royong), critical thinking in identifying environmental problems, and creativity in designing solutions. This shows that PBL is not only a teaching strategy but also a tool for character education.

Interdisciplinary integration is another key benefit found in the literature. Project-based tasks naturally combine various subject areas into a single learning experience. Studies highlight that elementary students find interdisciplinary learning more enjoyable and meaningful because it avoids the fragmentation of subjects. For instance, a project on healthy living could involve science (nutrition), mathematics (calculating food portions), Indonesian language (creating posters or reports), and physical education (designing exercise routines). This integration promotes holistic learning and helps students connect concepts across disciplines. Researchers emphasize that this approach is especially effective for young learners who understand concepts better when they are presented in contextual and interconnected ways.

In addition to its academic benefits, PBL also strengthens students' creativity. Literature shows that when students are asked to produce a tangible product such as a report, prototype, poster, or short presentation they are encouraged to think beyond traditional boundaries. Creativity

emerges not only in the final product but also during the process of brainstorming, drafting, and experimenting. These stages enable students to express ideas freely and explore different possibilities. Creativity, one of the 4C elements of 21st-century learning, becomes a central outcome of project-based curriculum design, making students more adaptable and innovative in the face of challenges.

Despite its advantages, the findings indicate several challenges in the implementation of project-based curriculum design. One of the major barriers is the readiness of teachers. Many elementary teachers still lack confidence in designing and managing project-based activities that align with learning objectives. Time limitation is another challenge, as PBL usually requires longer periods for planning, execution, and assessment. Schools that follow strict scheduling may find it difficult to allocate sufficient time for extended project work. Moreover, assessing project outcomes can be complex because teachers must evaluate not only the final result but also the learning process, collaboration, and student reflection. These factors often create difficulties for teachers who are used to traditional assessment methods such as quizzes and written tests.

Another challenge highlighted in the literature is the variability of student readiness. Elementary students have diverse learning needs, backgrounds, and developmental stages. Some students may thrive in open-ended project environments, while others may struggle with tasks that require autonomy or complex problem-solving. This diversity requires teachers to provide differentiated instruction and scaffolding throughout the project. Without proper guidance, students may become overwhelmed or disengaged. This emphasizes the importance of a well-structured plan and continuous teacher support to ensure that all students benefit equally from project-based learning.

Overall, the findings of this literature review clearly demonstrate that project-based curriculum design is a powerful approach to enhancing problem-solving skills in elementary students. It offers authentic learning experiences, strengthens critical thinking, supports character development, encourages interdisciplinary integration, and prepares students with the competencies needed in the 21st century. Despite the challenges, the advantages of implementing PBL outweigh its limitations, especially when teachers receive adequate training and institutional support. With proper execution, project-based curriculum design has the potential to transform elementary education into a more engaging, meaningful, and future-oriented learning environment. (Pangestu et al., 2024)

## **CONCLUSION**

This literature review concludes that project-based curriculum design is an effective and comprehensive approach for improving problem-solving skills in elementary school students, as it encourages active knowledge construction, critical and creative thinking, collaboration, and authentic engagement with real-world issues. The model aligns closely with the goals of the Merdeka Curriculum and the Profil Pelajar Pancasila, supporting both cognitive development and character formation through interdisciplinary learning experiences that foster independence, cooperation, responsibility, and creativity. Although challenges such as teacher readiness, assessment complexity, and time management persist, the overall evidence shows that the advantages of project-based learning far outweigh its limitations, making it a highly relevant and impactful strategy for preparing young learners to navigate the demands and challenges of 21st-century education.

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