

Implementation of Project-Based Learning (PjBL) Model Assisted by Interactive Digital Media in IPAS Learning for Grade IV Elementary School: A Systematic Literature Review

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Abstract

This study examines the implementation of Project Based Learning (PjBL) assisted by interactive digital media in Grade IV elementary school IPAS learning. Using a Systematic Literature Review (SLR) with the PRISMA approach, data were collected from the PoPCites database, resulting in 20 relevant articles selected from an initial 100. The findings indicate that PjBL supported by digital media such as Canva, Padlet, Wordwall, Genially, YouTube, and Augmented Reality enhances student motivation, participation, conceptual understanding, critical thinking, creativity, collaboration, and learning outcomes. Additionally, digital media help present abstract concepts in a more concrete and meaningful way. Thus, this approach is effective and adaptive in supporting the Merdeka Curriculum and developing 21st-century competencies in elementary education.

Keywords: Project-Based Learning (PjBL), Interactive Digital Media, Elementary School IPAS Learning

Abstrak

Studi ini meneliti implementasi Pembelajaran Berbasis Proyek (PjBL) yang dibantu media digital interaktif dalam pembelajaran IPAS kelas IV sekolah dasar. Dengan menggunakan Tinjauan Literatur Sistematis (SLR) dengan pendekatan PRISMA, data dikumpulkan dari basis data PoPCites, menghasilkan 20 artikel relevan yang dipilih dari 100 artikel awal. Temuan menunjukkan bahwa PjBL yang didukung oleh media digital seperti Canva, Padlet, Wordwall, Genially, YouTube, dan Augmented Reality meningkatkan motivasi siswa, partisipasi, pemahaman konseptual, berpikir kritis, kreativitas, kolaborasi, dan hasil belajar. Selain itu, media digital membantu menyajikan konsep abstrak dengan cara yang lebih konkret dan bermakna. Dengan demikian, pendekatan ini efektif dan adaptif dalam mendukung Kurikulum Merdeka dan mengembangkan kompetensi abad ke-21 dalam pendidikan dasar..

Kata kunci: Pembelajaran Berbasis Proyek (PjBL), Media Digital Interaktif, Pembelajaran IPAS Sekolah Dasar

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INTRODUCTION

Basic education has a strategic role in shaping students' thinking abilities, character and skills as provisions for facing the developments of the times (Dona & Armiami, 2025). In the context of the Independent Curriculum, learning is directed so that students not only master conceptual knowledge, but also are able to think critically, creatively, collaborate, and solve real-world problems (Gaol et.al, 2025). One of the subjects that has these characteristics is Natural and Social Sciences (IPAS), because it combines scientific and social concepts that are close to students' daily lives (Hasani et.al, 2025). Therefore, science and science learning requires an innovative and student-centered model (Hidayah, Rintayati, & Chumdari, 2022).

However, the implementation of science and science learning in elementary schools still faces various obstacles. The learning process is generally dominated by lecture methods, simple assignments, and limited use of media (Utami & Utari, 2025). This condition causes students to tend to be passive, less enthusiastic, and unable to connect the material with real situations in their environment (Yusro et.al, 2024). As a result, students' learning outcomes and 21st-century skills have not developed optimally (Yunitasari, Dzaroh, & Hidayah, 2024).

In addition, the characteristics of science material require concrete, contextual and meaningful learning experiences (Nuraeni & Aprianti, 2023). Elementary school students are at the concrete operational development stage, so they find it easier to understand concepts if they are directly involved through observation, experimentation, discussion, and project completion activities (Mertaningsi et.al, 2024). If learning only focuses on memorizing the material, then students' understanding will be shallow and easily forgotten (Meilina et.al, 2024).

One alternative that can be applied to answer this problem is the Project Based Learning Model or Project Based Learning (PjBL) (Pradipta et.al, 2022). This model positions students as the primary subjects of learning through activities such as designing, implementing, and producing a product from a project. Through PjBL, students are encouraged to actively seek information, collaborate in groups, and solve problems relevant to real life.(Pratama et.al, 2022). Thus, learning becomes more meaningful and challenging.

The application of PjBL in science learning is considered appropriate because the science material is very close to the social and natural environmental phenomena around students (Pratiwi & Sulianto, 2023). For example, students can create projects on waste management, simple energy utilization, local cultural preservation, or mapping environmental resources around the school. These activities allow students to learn through hands-on experience while fostering a sense of environmental and community awareness (Putri, Wardhani, & Usman, 2024).

On the other hand, the development of digital technology opens up great opportunities to improve the quality of learning (Rahayu et.al, 2024). The use of interactive digital media is able to present material visually, audibly, animatedly, and responsively, thereby attracting more student attention (Ramadhani, Zulela, & Fahrurrozi, 2021). Digital media also allows students to access broader information, conduct simulations, and interact with learning materials independently or collaboratively (Rauf, Kudus, & Arif, 2024). This makes the learning process more effective and enjoyable.

Interactive digital media combined with PjBL can strengthen each stage of project learning (Royanti & Sulindra, 2025). At the planning stage, students can search for references through digital platforms (D. Safitri & Fitriyani, 2025). At the implementation stage, students can use presentation, video, or graphic design applications to document the results of their work (Sawitri et.al, 2025). Meanwhile, during the evaluation stage, teachers can utilize interactive quizzes or digital portfolios to assess the process and results of student projects more comprehensively.(Salsabila, Suryandari, & Rahayu, 2025).

A number of studies show that the implementation of PjBL assisted by interactive digital media has a positive impact on learning outcomes, critical thinking skills, creativity, learning motivation, and collaboration skills of elementary school students (Saputra, Anggrayni, & Almirus, 2025). Students become more active in asking questions, discussing, and expressing ideas (Soleha & Firmansyah, 2024). Learning that was previously monotonous becomes more lively because students are directly involved in the process of creating work or solving a problem.

However, the implementation of PjBL assisted by interactive digital media in science learning still requires further study, especially regarding the effectiveness of its implementation in elementary schools (Solichin & Tyas, 2025). Each school has different conditions of infrastructure, teacher readiness, and student characteristics (EU Safitri et al., 2025). Therefore, research is needed to determine the extent to which this model can be implemented optimally and provide a real impact on student learning processes and outcomes.

METHOD

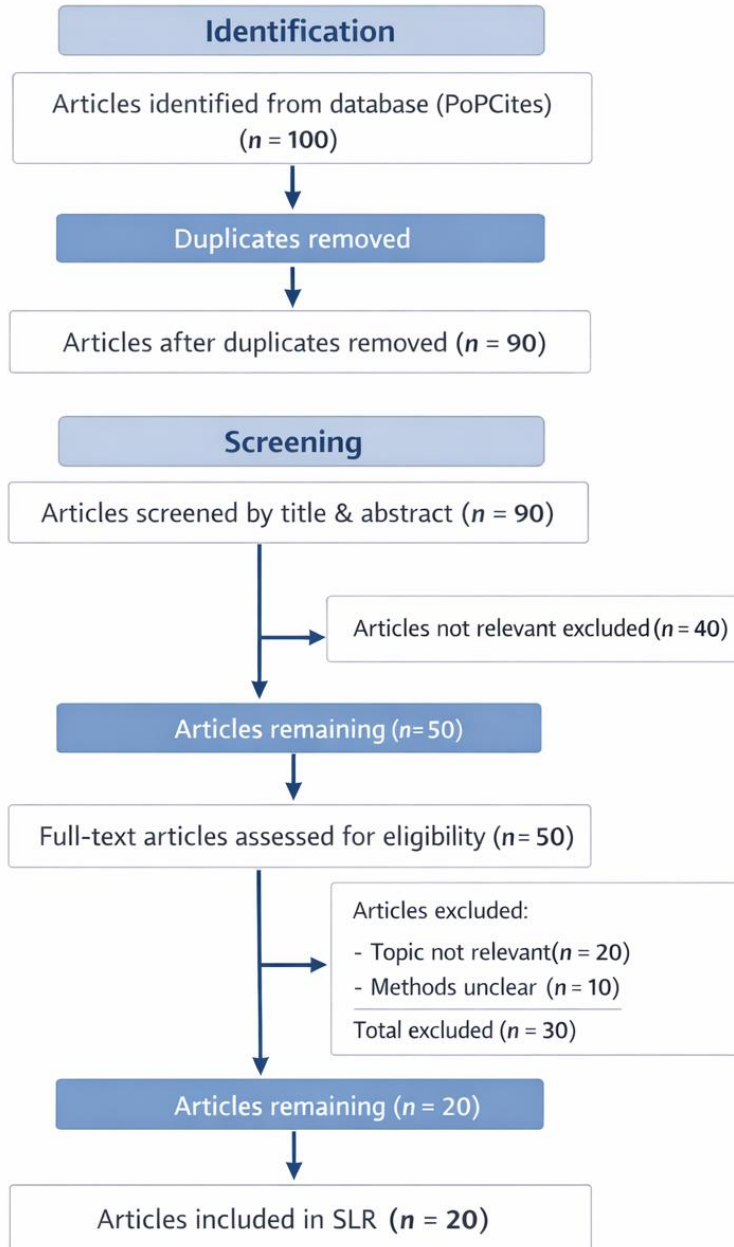
This study uses a Systematic Literature Review (SLR) approach with reference to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) stages. This method was chosen to identify, select, evaluate, and synthesize various relevant research results regarding the implementation of the Project Based Learning (PjBL) Model assisted by interactive digital media in science learning. Data sources were obtained through searching scientific articles in the PoPCites database using keywords related to PjBL, interactive digital media, and science learning. During the identification stage, 100 articles were found that matched the initial search topic.

The next stage was the screening process. Of the 100 articles found, duplicates were removed, leaving 90 remaining. These 90 articles were then selected based on their titles and abstracts to assess their suitability to the research focus. The screening results indicated that 40 articles were eliminated due to their irrelevance to the research theme, leaving 50 articles worthy of further review in the feasibility assessment stage.

At the eligibility stage, 50 full-text articles were analyzed in depth based on the established inclusion and exclusion criteria. From the evaluation results, 20 articles were eliminated because they were not on topic and 10 articles were eliminated because the research methods used were not clearly explained, resulting in a total of 30 articles being eliminated. Thus, 20 final articles were obtained that met the criteria and were used as the main sources in this systematic literature review. These articles were then analyzed to obtain an overview of the effectiveness of PjBL implementation assisted by interactive digital media in science learning. Graphically, the process of this research method is presented in the following PRISMA diagram.

PRISMA Diagram

Systematic Literature Review Flow



RESULTS AND DISCUSSION**Results**

Topic: Implementation of Project-Based Learning (PjBL) Model Assisted by Interactive Digital Media in Science Learning

Selection Method: PRISMA (final result n = 20 articles)

No	Writer	Year	Article Title	Publication Type	Status
1	Tueno, YR., et al.	2024	The Effect of Using the Project Based Learning Model Assisted by Digitally Genially-Based Interactive Media on Student Learning Outcomes in Science Learning for Class V at SDN 13 Telaga Biru.	Journal	Inclusion
2	Isrianti et.al	2025	The Impact of Project Based Learning Model Assisted by Interactive Digital Media on Critical Thinking Skills in the Science Subject of Fifth Grade Elementary School Students	Thesis	Inclusion
3	Budianti et.al	2024	Improving critical reasoning skills through project-based learning models assisted by digital media	Journal	Inclusion
4	Yusro et.al	2024	The 4th relevant article related to PjBL, interactive digital media, and IPAS	Journal	Inclusion
5	Jati et.al	2025	Project Based Learning Assisted by Interactive Media on the Motivation and Critical Thinking Skills of Fifth Grade Students in Science Learning	Journal	Inclusion
6	Ayomi et.al	2025	Science Project-Based Learning with Digital Interactive Board Support to Enhance Creativity and Deep Learning of Students at SDN II Abepura City	Journal	Inclusion
7	Purwanti et.al	2025	Implementation of the Project Based Learning (PjBL) Model with Interactive Media to Improve Collaborative Skills and Science Learning Outcomes of Fourth Grade Elementary School Students	Journal	Inclusion
8	Royanti et.al	2025	Development of Interactive Science Learning Media Based on Project Based Learning to Improve the Creativity of Fifth Grade Students at SDN Sering	Journal	Inclusion
9	Artanadi et.al	2024	Development of Interactive Learning Media Based on Project Based Learning in the Science Content of Indonesian Cultural Wealth for Grade IV Elementary School Students	Journal	Inclusion

10	Rahayu et.al	2024	Implementation of Interactive Eduposter Media in Science Subjects to Improve Students' Cognitive Abilities	Journal	Inclusion
11	Munawaroh et.al	2024	Interactive learning assisted by Bamboozle in increasing student learning motivation in science learning in class IV SDN Tembong 2	Journal	Inclusion
12	Siregar et.al	2024	Developing media literacy in science learning using project-based learning	Journal	Inclusion
13	Wiradana et.al	2025	Quizizz-Assisted Project Based Learning Model to Improve Science Learning Outcomes of 5th Grade Students at Celukan Bawang Public Elementary School	Journal	Inclusion
14	Meilina, et.al	2024	Development of Interactive Flash Multimedia Based on Project Based Learning for the Development of Science for Grade 4 Students	Journal	Inclusion
15	Andriyani et .al	2023	Development of Interactive Media Based on Project Based Learning (PjBL) for Grade VI Elementary School Students	Journal	Inclusion
16	Antari et.al	2023	Electronic modules based on project-based learning for science and natural sciences to improve the learning outcomes of elementary school students	Journal	Inclusion
17	Isrianti et.al	2025	nfluence of Project Based Learning Model Assisted by Interactive Digital Media on Students' Critical Thinking Skill in Social Science and Science Subjects	Journal	Inclusion
18	Sari et.al	2025	Implementation of the project-based learning model assisted by the Canva application on science learning outcomes	Journal	Inclusion
19	Hidayat et.al	2024	Project Based Learning (Pjbl) Assisted by Wordwall Learning Media on Students' Critical Thinking Skills in Schools	Journal	Inclusion
20	Hidayah et.al	2025	Learning in Science Subjects Using the Pjbl Model Assisted by Interactive Flat Panel (IFP) Media for Grade V Students	Journal	Inclusion

Selection Results Summary:

- Total initial articles from PoPCites: 100
- After removing duplication: 90
- Title & abstract screening: 50
- Full-text worthy of analysis: 20 articles

Based on the selection results using the PRISMA method, 20 articles were obtained that met the inclusion criteria and were eligible for analysis in the Systematic Literature Review (SLR). These articles focused on the implementation of the Project-Based Learning (PjBL) Model combined with interactive digital media in science learning in elementary schools. Most of the articles came from accredited national journal publications, while others were theses and scientific proceedings. The publication year range was predominantly from 2023–2025, indicating that this topic is a relevant and developing issue in current elementary education research.

The analysis results show that the most dominant research theme is improving student learning outcomes after implementing the PjBL model with the assistance of interactive digital media. Several studies report that students experience improved understanding of science concepts because learning is carried out through contextual project activities close to everyday life. Furthermore, the use of digital media such as Genially, interactive multimedia, and digital interactive boards can help students understand abstract material in a more concrete, engaging, and understandable way.

Besides learning outcomes, another aspect that has received much research is students' critical thinking and reasoning skills. Findings from several articles indicate that the PjBL model provides students with opportunities to analyze problems, seek information, discuss, and design solutions through group projects. The support of interactive digital media further enhances this process, allowing students to explore the material independently, access a wider range of learning resources, and present their work creatively. Thus, learning is not only oriented towards mastery of the material but also towards developing higher-order thinking skills.

Furthermore, several articles also highlight the increased creativity, collaboration, motivation, and engagement of students during the learning process. Through PjBL, students are encouraged to produce tangible products such as digital posters, interactive presentations, simple videos, or environmental projects. These activities encourage students to participate more actively, collaborate with their peers, and develop a sense of responsibility for assigned tasks. The use of digital platforms like Quizizz and Wordwall has also been shown to increase student enthusiasm, making learning more varied and enjoyable.

Overall, the results of a review of 20 articles indicate that the implementation of interactive digital media-assisted PjBL has a positive impact on the quality of science learning in elementary schools. This model effectively improves learning outcomes, critical thinking skills, creativity, collaboration, and student motivation. Therefore, interactive digital media-assisted PjBL can be used as an alternative innovative learning strategy that aligns with the demands of the Independent Curriculum and the need for 21st-century skills. However, its successful implementation still requires the support of technological resources, teacher readiness, and thorough lesson planning.

Discussion

The study results indicate that the implementation of Project-Based Learning (PjBL) supported by interactive digital media is an effective approach in learning science in fourth-grade elementary schools. Of the 20 articles analyzed, most reported improvements in the quality of the learning process and learning outcomes after implementing the model. These findings demonstrate that PjBL is able to meet the needs of science learning, which requires active student involvement in understanding natural and social phenomena contextually. Learning is no longer teacher-centered, but rather provides space for students to explore problems, design projects, and produce real-world work. These results align with the opinion of Hidayah, Rintayati, and Chumdari (2022) who stated that PjBL can increase student learning engagement in elementary schools.

In terms of learning outcomes, this article found that interactive digital media such as Genially, Canva, Wordwall, Padlet, YouTube, and AR media significantly support the success of Project-Based Learning (PjBL). These media help students understand abstract science concepts more concretely through visualization of images, animations, videos, and interactive simulations. This is highly relevant to the characteristics of elementary school students who are still at the concrete operational stage. This finding is reinforced by research by Yunitasari, Dzaroh, and Hidayah (2024) which shows that the use of multimedia in Project-Based Learning (PjBL) has a positive effect on the science learning outcomes of fifth-grade students. Thus, the integration of digital media is not merely a complement, but an important component in the success of project learning.

In addition to improving learning outcomes, Galih's article also emphasizes that interactive digital media-assisted PjBL contributes to students' critical thinking skills. During the project process, students are required to identify problems, search for data, discuss them, and develop solutions based on the information obtained. These activities directly train higher-order thinking skills (HOTS). This finding aligns with research by Solichin and Tyas (2025), which found that project-based learning significantly impacts fifth-grade students' critical thinking skills in science. Therefore, this model aligns well with the direction of the Independent Curriculum, which emphasizes strengthening critical reasoning skills.

In terms of creativity and collaboration, research results show that students become more active in collaborating and producing innovative learning products. These products can include digital posters, interactive presentations, e-booklets, educational videos, or simple environmental projects. These activities train students to communicate, share roles, and take responsibility for group assignments. These findings support research by Royanti and Sulindra (2025), which explains that interactive learning media based on Project-Based Learning (PjBL) can enhance the creativity of elementary school students. In other words, project-based learning not only improves cognitive aspects but also social abilities and 21st-century skills.

Furthermore, this article also found an increase in student motivation and engagement during the learning process. The use of interactive digital platforms made the learning environment more enjoyable, less monotonous, and in keeping with the characteristics of today's digital generation. Students were more enthusiastic about participating in the learning process because of the elements of challenge, engaging visuals, and opportunities to showcase their work. This finding aligns with research by Salsabila, Suryandari, and Rahayu (2025), which stated that technology-based learning can increase the motivation and learning engagement of science students. This suggests that the appropriate use of technology can be a significant stimulus in increasing student participation.

However, this research also indicates that the successful implementation of interactive digital media-assisted PjBL is heavily influenced by teacher readiness, school facilities, and thorough learning planning. Not all schools have access to adequate digital devices and internet connections. Furthermore, teachers need pedagogical competence and digital literacy to design meaningful projects. Therefore, school support is needed through teacher training, the provision of technological resources, and policies that encourage learning innovation. Overall, this article confirms that interactive digital media-assisted PjBL is a relevant, adaptive, and effective strategy for improving the quality of science learning in elementary schools in the digital era.

CONCLUSION

Based on the results of the Systematic Literature Review (SLR), it can be concluded that the implementation of Project Based Learning (PjBL) assisted by interactive digital media is an effective learning approach in learning science in grade IV

elementary schools. The integration of the PjBL model with various digital media such as Padlet, Canva, Wordwall, YouTube, Simplebooklet, and Augmented Reality can create more interesting, contextual, and student-centered learning. This model provides opportunities for students to learn through direct experience, problem solving, and the creation of real projects relevant to everyday life.

The analysis results show that the implementation of PjBL supported by interactive digital media has a positive impact on improving student learning outcomes, motivation, activeness, creativity, critical thinking skills, and collaboration skills. Interactive digital media plays a crucial role in visualizing abstract science concepts into more concrete and understandable concepts for elementary school students. Thus, the use of digital technology can strengthen every stage of project learning, from planning, implementation, to evaluation.

Overall, the interactive digital media-assisted PjBL model is relevant to support the implementation of the Independent Curriculum and the development of 21st-century competencies. However, its successful implementation requires technological infrastructure, teacher readiness in digital literacy, and thorough lesson planning. Therefore, teachers and schools are advised to continue developing project-based and technology-based learning innovations to improve the quality of science and science learning in elementary schools.

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