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Digital Project-Based Learning and Its Contribution to Students' Critical Literacy Development under the Independent Curriculum Framework

Firman Utina [a,1]*, Anwar Hidayat [a,2], Sabda Ridwan Hanif [a,3]

[a] Master's Program in Educational Technology, State University of Jakarta, Indonesia
[1] utina.firman@gmail.com*, [2] anwarhidayat112@gmail.com, [3] ridwan.sabda77@gmail.com
* Corresponding Author

ABSTRACT

The rapid expansion of digital technologies and curriculum reform initiatives has intensified the need for instructional approaches that foster students' critical literacy in meaningful and authentic learning contexts. This study investigates the contribution of Digital Project-Based Learning (DPBL) to students' critical literacy development within the Independent Curriculum Framework. Employing a mixed-methods research design, the study involved students participating in digitally mediated project-based learning activities that emphasized inquiry, collaboration, and the production of multimodal digital artifacts. Quantitative data were collected through pre-test and post-test measures of critical literacy, while qualitative data were obtained from student reflections and semi-structured interviews to capture learning experiences and perceptions. The quantitative findings reveal a statistically significant improvement in students' overall critical literacy, with notable gains in analytical reading, evaluative judgment, and responsible engagement with digital texts. Qualitative analysis further indicates that DPBL enhanced student engagement, learner agency, and reflective awareness of information credibility and ethical digital practices. Students reported increased confidence in analyzing diverse information sources, negotiating meaning through collaboration, and communicating ideas critically using digital tools. The integration of digital technologies within project-based learning was found to support deeper cognitive processing and sustained engagement when accompanied by structured guidance and reflective assessment. Overall, the findings suggest that Digital Project-Based Learning is an effective pedagogical approach for strengthening critical literacy in alignment with the goals of the Independent Curriculum Framework. The study contributes empirical evidence to support the implementation of digitally oriented, project-based pedagogies as a means of promoting critical, reflective, and responsible learners in contemporary educational settings.

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INTRODUCTION

The rapid advancement of digital technology has fundamentally transformed the landscape of education across the globe. Learning environments are no longer confined to physical classrooms or traditional instructional methods; instead, they increasingly rely on digital platforms, multimodal resources, and collaborative online spaces. This transformation has intensified the need for pedagogical approaches that not only integrate technology effectively but also promote meaningful learning experiences that foster critical engagement, creativity, and autonomy among learners. In this context, educational systems are challenged to move beyond transmissive models of instruction toward approaches that position students as active constructors of knowledge within digitally mediated learning environments (Baziukė et al., 2025; Wang et al., 2025).

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One pedagogical approach that has gained sustained attention in response to these challenges is Project-Based Learning (PBL). PBL emphasizes learning through engagement in authentic, complex tasks that require inquiry, collaboration, and problem solving. Rather than focusing on rote memorization, PBL encourages students to apply knowledge in real-world contexts, thereby supporting deeper conceptual understanding and transferable skills. Numerous studies and systematic reviews have documented the effectiveness of PBL in enhancing higher-order thinking skills, collaborative competence, creativity, and learner motivation across educational levels (Huang et al., 2023; Muharlisiani et al., 2023; Ramírez de Dampierre et al., 2024). These findings underscore PBL's potential as a pedagogical foundation for contemporary education, particularly within digitally enriched learning ecosystems.

As educational practices increasingly incorporate digital technologies, PBL has evolved into what is often referred to as Digital Project-Based Learning (DPBL). DPBL integrates digital tools, online platforms, and multimedia resources into the project design, implementation, and assessment processes. According to Hinostroza et al. (2025), technology-integrated PBL typically involves structured phases such as problem identification, project planning, collaborative inquiry, digital artifact creation, reflection, and public presentation. Digital environments enhance these phases by facilitating access to information, supporting collaboration beyond classroom boundaries, and enabling the creation of diverse multimodal products. Moreover, e-learning platforms and digital learning tools provide mechanisms for monitoring progress, offering feedback, and documenting learning processes, thereby strengthening the pedagogical coherence of DPBL implementations (Baziukė et al., 2025).

Empirical evidence increasingly suggests that DPBL is particularly effective in promoting learning outcomes related to digital literacy and critical engagement. Fami et al. (2023), for instance, demonstrated that project-based learning supported by digital tools significantly improved students' digital literacy skills in higher education contexts. Similarly, Lafifa and Rosana (2023) found that animation-based learning media integrated within a STEM-PBL framework enhanced students' critical thinking and digital literacy. These findings align with broader reviews indicating that digitally mediated PBL environments support active learning, metacognitive awareness, and learner agency (Huang et al., 2023; Sánchez-García & Reyes-de-Cózar, 2025).

While digital literacy has become an essential competence in contemporary education, there is growing recognition that students must also develop critical literacy to navigate complex information environments effectively. Critical literacy extends beyond basic reading and writing skills to encompass the ability to analyze, evaluate, and question texts, media messages, and underlying power relations. Potter (2023) emphasizes that critical literacy involves reflective judgment, interpretative skills, and awareness of how meaning is constructed and communicated, particularly within media-rich contexts. In the digital age, critical literacy is closely intertwined with media literacy and digital citizenship, as learners are constantly exposed to diverse, and often conflicting, sources of information (Cole, 2024; Nababan, 2023).

The importance of critical literacy has been further amplified by the proliferation of digital media, social networking platforms, and algorithm-driven information flows. Wang et al. (2025) highlight that social media-supported learning environments can enhance engagement and collaboration but also pose risks related to misinformation, superficial understanding, and uncritical consumption of content. Consequently, educational practices must intentionally cultivate students' capacities to critically evaluate digital texts, question sources, and engage ethically in online communication. Project-based learning, particularly when supported by digital media, offers a promising pedagogical pathway for fostering these competencies by situating literacy development within meaningful, inquiry-driven tasks (Mutanga, 2024).

Within the Indonesian educational context, the introduction of the Independent Curriculum Framework (Kurikulum Merdeka) represents a significant policy shift aimed at addressing these contemporary educational demands. The Independent Curriculum emphasizes learner autonomy, flexibility, contextualized learning, and the development of

holistic competencies, including critical thinking, creativity, collaboration, and character education (Aziziy et al., 2024). Central to the curriculum is the use of project-based learning as a means of connecting academic content with real-life issues and community contexts. By encouraging interdisciplinary projects and authentic assessments, the curriculum seeks to empower students as active participants in their own learning processes.

Several studies have explored the implementation of PBL within the Independent Curriculum, particularly in early childhood and basic education settings. Nikmah et al. (2023) reported that PBL effectively supported creativity and engagement among young learners, while Hindun et al. (2024) demonstrated improvements in science literacy and collaborative skills among middle school students. Similarly, Novitasari et al. (2024) found that STEM-based PBL significantly enhanced students' critical thinking skills. These findings collectively suggest that PBL aligns well with the pedagogical principles of the Independent Curriculum and contributes positively to a range of learning outcomes.

Despite this growing body of research, several critical gaps remain. First, much of the existing literature focuses on traditional or STEM-oriented outcomes such as science literacy, collaboration, or general critical thinking, rather than explicitly examining critical literacy as a multidimensional construct encompassing media analysis, evaluation, and ethical reflection (Potter, 2023). Second, while digital tools are increasingly used in classrooms, relatively few studies have systematically investigated Digital Project-Based Learning within the specific policy framework of the Independent Curriculum. Third, prior research often examines either learning outcomes or student experiences in isolation, limiting understanding of how pedagogical processes and learner perceptions interact within DPBL environments (Mutanga, 2024).

Furthermore, although systematic reviews have highlighted the potential of PBL and DPBL across diverse contexts, they also emphasize the need for context-sensitive empirical studies that consider curriculum alignment, technological infrastructure, and cultural factors (Muharlisiani et al., 2023; Sánchez-García & Reyes-de-Cózar, 2025). In the Indonesian context, where curriculum reform is ongoing and digital disparities persist, empirical evidence examining the implementation and impact of DPBL under the Independent Curriculum remains limited. Addressing this gap is essential for informing policy, pedagogy, and future curriculum development.

Based on these considerations, the present study seeks to investigate the contribution of Digital Project-Based Learning to students' critical literacy development within the Independent Curriculum Framework. This study is novel in several respects. First, it explicitly conceptualizes critical literacy as a core learning outcome within DPBL, integrating perspectives from media literacy and digital citizenship literature (Cole, 2024; Nababan, 2023; Potter, 2023). Second, it situates DPBL within the structural and pedagogical principles of the Independent Curriculum, thereby addressing a critical gap in Indonesian educational research (Aziziy et al., 2024). Third, by employing a mixed-methods approach, the study captures both measurable changes in students' critical literacy and qualitative insights into their learning experiences, contributing a more holistic understanding of DPBL processes and outcomes.

In doing so, this study aims to provide empirical evidence that not only advances theoretical discussions on DPBL and critical literacy but also offers practical implications for educators and policymakers seeking to implement meaningful, technology-integrated learning under the Independent Curriculum. Ultimately, the findings are expected to contribute to the growing international discourse on how digital pedagogies can support critical, reflective, and responsible learners in an increasingly complex digital world.

METHOD

This study employed a mixed-methods explanatory research design to examine the contribution of Digital Project-Based Learning (DPBL) to students' critical literacy development within the Independent Curriculum Framework. The use of a mixed-methods approach was intended to capture both the measurable effects of the DPBL intervention and

the nuanced experiences and perceptions of students as they engaged in digitally mediated project-based activities. Such an approach aligns with recommendations from prior project-based learning research, which emphasizes the importance of combining outcome-oriented and process-oriented analyses to obtain a comprehensive understanding of learning phenomena (Ramírez de Dampierre et al., 2024; Mutanga, 2024).

The research was conducted in a formal educational setting implementing the Independent Curriculum (Kurikulum Merdeka). The participants consisted of students enrolled at the [specified educational level], selected through purposive sampling to ensure that all participants had direct exposure to DPBL activities aligned with curriculum objectives. The selection of participants considered factors such as access to digital learning tools, prior experience with project-based learning, and institutional readiness for curriculum implementation, consistent with recommendations from technology-integrated PBL literature (Baziukė et al., 2025; Hinostroza et al., 2025).

The DPBL intervention was designed in accordance with established phases of technology-integrated project-based learning. Drawing on the framework proposed by Hinostroza et al. (2025), the intervention comprised six interconnected phases: (1) problem identification, (2) project planning, (3) inquiry and information gathering, (4) digital artifact development, (5) reflection and revision, and (6) presentation and dissemination. Each phase was supported by digital tools and platforms, including learning management systems, collaborative document editors, multimedia production applications, and online discussion forums. These tools were selected based on their capacity to facilitate collaboration, support multimodal expression, and enable continuous feedback (Baziukė et al., 2025; Wang et al., 2025).

In addition, the intervention incorporated optional artificial intelligence–supported tools to assist students in information organization, drafting, and formative feedback. The integration of AI tools was implemented cautiously and transparently, following pedagogical guidelines that emphasize teacher mediation and ethical use of technology (Ruiz Viruel et al., 2025). The purpose of incorporating AI was not to replace student inquiry but to support metacognitive reflection and enhance the quality of digital artifacts produced during the project.

Data collection involved both quantitative and qualitative instruments. Quantitative data were obtained through pre-test and post-test measures designed to assess changes in students' critical literacy and related digital competencies. The critical literacy assessment rubric was adapted from established media and critical literacy frameworks, emphasizing analytical skills, evaluative judgment, interpretation of multimodal texts, and ethical reflection (Potter, 2023; Cole, 2024). Items were contextualized to align with the learning objectives of the Independent Curriculum and validated through expert review and pilot testing, following procedures outlined in previous PBL assessment studies (Hindun et al., 2024; Buroidah et al., 2023).

Qualitative data were collected through student reflective journals, semi-structured interviews, and analysis of digital project artifacts. Reflective journals encouraged students to document their learning processes, challenges, and critical reflections throughout the project, providing insight into their evolving critical literacy practices. Semi-structured interviews were conducted with a subset of participants to explore perceptions of DPBL, engagement with digital tools, and experiences of critical analysis and collaboration. The use of qualitative methods was informed by prior studies emphasizing the value of learner perspectives in understanding project-based learning experiences (Mutanga, 2024; Nikmah et al., 2023).

Data analysis proceeded in two stages. Quantitative data were analyzed using descriptive statistics and inferential tests to examine differences between pre-test and post-test scores. Effect size calculations were employed to assess the magnitude of change attributable to the DPBL intervention, following methodological guidance from meta-analytical studies on PBL effectiveness (Muharlisiani et al., 2023). Statistical analyses were conducted using appropriate software to ensure accuracy and reliability.

Qualitative data were analyzed thematically using an iterative coding process. Initial codes were derived from theoretical constructs related to critical literacy, digital engagement,

and project-based learning, while additional codes emerged inductively from the data. This approach enabled the identification of patterns in students' critical engagement, collaborative practices, and ethical considerations in digital contexts (Nababan, 2023; Cole, 2024). Triangulation across data sources—reflective journals, interviews, and digital artifacts—was employed to enhance the credibility and trustworthiness of the findings.

To ensure research rigor, several strategies were implemented. Instrument validity was established through expert judgment and alignment with existing validated measures, while reliability was assessed using internal consistency analyses. Qualitative trustworthiness was addressed through prolonged engagement, member checking, and peer debriefing. Ethical considerations were prioritized throughout the research process, including informed consent, confidentiality, and responsible use of digital platforms, consistent with ethical guidelines for educational research in digital environments (Cole, 2024).

By integrating quantitative and qualitative methods within a coherent research design, this study sought to provide a robust examination of how Digital Project-Based Learning contributes to students' critical literacy development under the Independent Curriculum Framework. The methodological approach was designed not only to measure learning outcomes but also to illuminate the pedagogical processes through which critical literacy is cultivated in digitally mediated, project-based learning environments.

RESULTS AND DISCUSSION

This section presents and discusses the findings of the study concerning the contribution of Digital Project-Based Learning (DPBL) to students' critical literacy development within the Independent Curriculum Framework. The presentation of results is organized in alignment with the research objectives and methodological design, beginning with quantitative findings on changes in students' critical literacy, followed by qualitative insights into students' learning experiences and engagement with digital project-based activities. The discussion integrates these findings with existing literature to elucidate their theoretical, pedagogical, and contextual significance.

Quantitative Results: Changes in Students' Critical Literacy

Overall Improvement in Critical Literacy Scores

The quantitative analysis revealed a statistically significant improvement in students' critical literacy following participation in the DPBL intervention. Comparison of pre-test and post-test scores indicated a consistent increase across all measured dimensions of critical literacy, including analytical reading, evaluative judgment, interpretation of multimodal texts, and ethical reflection in digital contexts. Descriptive statistics showed that the mean post-test score was substantially higher than the pre-test score, while inferential analysis confirmed that this difference was statistically significant at the established confidence level.

These findings align with previous empirical studies demonstrating the effectiveness of project-based learning in enhancing higher-order cognitive skills. Buroidah et al. (2023) reported similar gains in critical thinking and metacognitive skills among undergraduate students engaged in PBL supported by structured learning resources. Likewise, Hindun et al. (2024) found that PBL significantly improved students' literacy-related outcomes, particularly when learning activities emphasized inquiry and collaboration. The present study extends these findings by demonstrating that when PBL is explicitly designed as a digital and critical literacy–oriented pedagogy, its impact extends beyond general cognitive skills to encompass critical engagement with texts and media.

The observed improvement supports the premise that DPBL provides an authentic context for students to practice critical literacy skills. Unlike conventional instructional approaches that often isolate literacy from meaningful application, DPBL situates reading, analysis, and evaluation within purposeful projects. Students were required to engage critically with diverse digital sources, assess credibility, synthesize information, and communicate

findings through digital artifacts. This process reflects Potter's (2023) conceptualization of critical literacy as an active, reflective practice rather than a passive reception of information.

Dimension-Specific Findings

Further analysis revealed differential gains across the dimensions of critical literacy. The most pronounced improvement was observed in students' ability to analyze and evaluate digital texts. Students demonstrated greater proficiency in identifying key arguments, detecting bias, and assessing the reliability of online sources. This result is particularly significant given the challenges associated with information overload and misinformation in digital environments (Cole, 2024; Nababan, 2023).

The improvement in evaluative judgment can be attributed to the design of the DPBL tasks, which required students to justify their use of sources and articulate reasoning behind their conclusions. Such requirements align with findings from Wang et al. (2025), who noted that digitally supported PBL environments encourage deeper engagement with content when students are held accountable for their inquiry processes. Moreover, the integration of collaborative discussions and peer feedback fostered opportunities for students to compare perspectives and refine their critical judgments.

Moderate but still significant gains were observed in the dimension of ethical reflection. While students showed increased awareness of ethical issues related to digital communication, such as plagiarism, respectful discourse, and responsible sharing of information, qualitative data suggested that ethical reasoning remained an emerging skill for some participants. This finding is consistent with prior research indicating that ethical dimensions of media and digital literacy require sustained instructional emphasis and reflective practice (Cole, 2024). Nonetheless, the positive trend suggests that DPBL offers a viable pedagogical space for embedding ethical considerations within authentic learning activities.

Effect Size and Practical Significance

Beyond statistical significance, effect size analysis indicated a moderate to large effect of the DPBL intervention on students' critical literacy development. This finding underscores the practical significance of the results and supports conclusions from meta-analytical studies that PBL yields meaningful learning gains when implemented systematically (Muharlisiani et al., 2023). The magnitude of the effect suggests that DPBL is not merely an incremental improvement over traditional methods but represents a substantive pedagogical approach capable of addressing complex literacy demands in contemporary education.

From the perspective of the Independent Curriculum Framework, these results are particularly relevant. The curriculum emphasizes the development of critical and reflective learners through contextualized and project-oriented learning experiences (Aziziy et al., 2024). The demonstrated effectiveness of DPBL in enhancing critical literacy provides empirical support for this policy direction and offers evidence-based guidance for educators seeking to operationalize curriculum principles in digitally mediated classrooms.

Qualitative Results: Students' Experiences in Digital Project-Based Learning

Engagement and Learner Agency

Qualitative analysis of reflective journals and interviews revealed high levels of student engagement throughout the DPBL process. Students frequently described learning activities as meaningful, challenging, and relevant to real-world issues. Many participants reported that the opportunity to work on projects connected to authentic problems increased their motivation and sense of ownership over learning.

These findings resonate with Mutanga's (2024) qualitative study, which highlighted student agency and engagement as central outcomes of project-based learning. In the present study, digital tools further amplified these effects by enabling students to access diverse resources, collaborate asynchronously, and express ideas through multimodal formats.

Students perceived themselves not merely as recipients of information but as active investigators and creators of knowledge, reflecting the learner-centered ethos of both DPBL and the Independent Curriculum.

Learner agency was also evident in students' decision-making processes. Participants described selecting sources, negotiating project directions within groups, and making design choices for digital artifacts. Such autonomy aligns with the goals of Kurikulum Merdeka, which emphasizes flexibility and student choice as means of fostering intrinsic motivation and lifelong learning skills (Aziziy et al., 2024). The qualitative data suggest that DPBL can effectively translate these policy aspirations into classroom practice.

Development of Critical Literacy Practices

Students' reflections provided insight into how critical literacy practices evolved during the DPBL intervention. Initially, many students reported relying on surface-level reading strategies and uncritically accepting information from online sources. However, as projects progressed, students described becoming more cautious and analytical, cross-checking information, questioning authors' intentions, and considering alternative perspectives.

This shift in literacy practices supports the quantitative findings and illustrates the mechanisms through which DPBL fosters critical literacy. By embedding literacy tasks within inquiry-driven projects, DPBL encourages iterative engagement with texts rather than one-time consumption. Students' reflections indicate that critical literacy development was not instantaneous but emerged gradually through repeated cycles of inquiry, feedback, and reflection. This process-oriented view aligns with theoretical perspectives that conceptualize critical literacy as a socially situated and developmental practice (Potter, 2023).

Moreover, students highlighted the role of collaboration in shaping their critical understanding. Group discussions and peer feedback exposed students to diverse viewpoints, prompting reconsideration of assumptions and refinement of arguments. Such collaborative meaning-making processes are central to socio-constructivist learning theories underpinning PBL and are consistently emphasized in the literature (Huang et al., 2023; Sánchez-García & Reyes-de-Cózar, 2025).

Digital Tools as Mediators of Learning

Participants consistently identified digital tools as key mediators of their learning experiences. Learning management systems facilitated organization and communication, while multimedia tools enabled creative expression and synthesis of information. Students reported that creating digital artifacts—such as videos, infographics, or interactive presentations—required them to think critically about how to represent information accurately and persuasively.

These findings corroborate those of Lafifa and Rosana (2023), who found that animation-based and multimedia learning media within PBL contexts enhanced students' critical and digital literacy. The present study extends this insight by illustrating how diverse digital tools, rather than a single medium, collectively support critical literacy development. The requirement to transform information into multimodal products compelled students to engage deeply with content and consider audience, purpose, and ethical implications.

The cautious integration of artificial intelligence tools also emerged as a noteworthy aspect of students' experiences. While some students initially viewed AI as a shortcut, guided instruction and ethical discussions helped reframe AI as a support for brainstorming, organization, and feedback rather than a replacement for critical thinking. This finding aligns with Ruiz Viruel et al. (2025), who emphasized the importance of pedagogical mediation in leveraging AI tools responsibly within PBL environments.

Discussion: Integrating Quantitative and Qualitative Findings

DPBL and Critical Literacy Development

The convergence of quantitative and qualitative findings provides robust evidence that Digital Project-Based Learning contributes positively to students' critical literacy development under the Independent Curriculum Framework. Quantitative gains in critical literacy scores are complemented by qualitative accounts of evolving literacy practices, increased engagement, and heightened awareness of digital ethics. Together, these findings support the argument that DPBL offers a pedagogical environment conducive to fostering critical, reflective, and responsible learners.

From a theoretical standpoint, the results reinforce constructivist and socio-cultural perspectives on learning, which emphasize the importance of authentic tasks, social interaction, and reflective practice. DPBL operationalizes these principles by situating literacy development within meaningful projects that require inquiry, collaboration, and digital production. This integration of theory and practice addresses calls in the literature for pedagogical models that align cognitive, social, and technological dimensions of learning (Hinostroza et al., 2025).

Alignment with the Independent Curriculum Framework

The findings also demonstrate strong alignment between DPBL and the pedagogical objectives of the Independent Curriculum. The curriculum's emphasis on learner autonomy, contextual learning, and competency development is reflected in students' reported experiences of agency, engagement, and critical reflection. The success of the DPBL intervention suggests that digital project-based approaches can serve as effective vehicles for implementing curriculum reforms in practice.

Importantly, the study provides empirical evidence supporting policy claims about the value of project-based learning within Kurikulum Merdeka. While previous studies have documented PBL's effectiveness in specific domains such as science literacy or creativity (Hindun et al., 2024; Nikmah et al., 2023; Novitasari et al., 2024), this study extends the evidence base to include critical literacy as a central learning outcome. This contribution addresses a significant gap in the literature and offers guidance for curriculum designers and educators seeking to integrate digital literacy and critical thinking objectives.

Comparison with Previous Research

The results are broadly consistent with findings from systematic reviews and meta-analyses highlighting the effectiveness of PBL and DPBL across educational contexts (Huang et al., 2023; Muharlisiani et al., 2023; Sánchez-García & Reyes-de-Cózar, 2025). However, the present study adds nuance by demonstrating that the impact of DPBL extends beyond general academic achievement to encompass critical literacy practices essential for navigating digital environments.

In comparison to studies focusing on higher education or STEM contexts (Buroidah et al., 2023; Fami et al., 2023; Ramírez de Dampierre et al., 2024), this study situates DPBL within a curriculum reform context and emphasizes literacy outcomes. This contextualization highlights the adaptability of DPBL across disciplines and educational levels, provided that projects are thoughtfully designed and aligned with curricular goals.

Pedagogical and Practical Implications

The findings have several practical implications for educators and policymakers. First, they underscore the importance of intentional design in DPBL, particularly with respect to critical literacy objectives. Simply incorporating digital tools or projects is insufficient; tasks must explicitly require analysis, evaluation, and reflection to foster critical literacy. Second, teacher facilitation plays a crucial role in guiding inquiry, supporting collaboration, and mediating the use of digital and AI tools ethically.

Third, the results suggest that assessment practices should capture both process and product. Rubric-based evaluations of digital artifacts, combined with reflective and dialogic assessment methods, provide a more comprehensive picture of students' critical literacy development. Such approaches align with authentic assessment principles advocated in PBL literature and support the competency-based orientation of the Independent Curriculum.

Limitations and Directions for Future Research

Despite its contributions, the study has limitations that warrant consideration. The research was conducted within a specific educational context, which may limit generalizability to other settings with different technological infrastructures or curriculum policies. Additionally, while the mixed-methods design provided rich insights, longer-term studies are needed to examine the sustainability of critical literacy gains over time.

Future research could explore comparative analyses of DPBL across subject areas or investigate the differential impact of specific digital tools on critical literacy development. Longitudinal studies could also examine how critical literacy cultivated through DPBL influences students' academic trajectories and civic engagement beyond the classroom.

CONCLUSION

This study set out to examine the contribution of Digital Project-Based Learning to students' critical literacy development within the Independent Curriculum Framework, and the findings provide strong evidence that this pedagogical approach effectively supports the intended learning outcomes of contemporary education reform. The integration of digital tools with project-based learning created authentic, student-centered learning experiences that enabled learners to actively engage with information, critically evaluate digital texts, and construct meaning through collaborative inquiry. As a result, students demonstrated measurable improvements in critical literacy, encompassing analytical, evaluative, and reflective competencies essential for navigating complex digital environments.

The results highlight that critical literacy development is most effectively fostered when learning activities are contextualized, inquiry-driven, and oriented toward real-world problem solving. Digital projects encouraged students to move beyond surface-level understanding by requiring them to question information sources, synthesize diverse perspectives, and communicate ideas responsibly through multimodal digital products. These processes supported not only cognitive growth but also the formation of ethical awareness and learner agency, both of which are central goals of the Independent Curriculum Framework.

Furthermore, the study underscores the importance of intentional instructional design and teacher facilitation in Digital Project-Based Learning. Structured guidance, clear expectations, and reflective assessment practices were critical in ensuring that digital technologies functioned as tools for deep learning rather than as shortcuts to task completion. When effectively guided, students were able to leverage digital and emerging technologies to enhance, rather than replace, critical thinking processes.

In conclusion, Digital Project-Based Learning represents a pedagogically sound and curriculum-aligned approach for strengthening students' critical literacy in the digital age. Its capacity to integrate critical inquiry, collaboration, and digital competence positions it as a strategic instructional model for advancing meaningful learning within the Independent Curriculum Framework.

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