Elbash: Journal of Social Science and Education
E-ISSN: xxxx-xxxx
Volume 1, Issue 1, May 2026, pp. 20-33
DOI:

The Effect of Project-Based Learning on Students' Critical Thinking Skills in Islamic Higher Education

Lilik Aminah[1*], Adham Hasif bin Najmuddin[2]
[1] Universitas Islam Internasional Darullughah Wadda'wah, Pasuruan, Indonesia
[2] Universiti Malaya, Kuala Lumpur, Malaysia
[1]lilikaminah@uiidalwa.ac.id, [2]25002139@siswa.um.edu.my
*Correspondence

Article Information:
Received: 12 April 2026
Revised: 24 May 2026
Accepted: 25 May 2026
Published: 30 May 2026

Keywords:
Project-Based Learning, Critical Thinking Skills, Islamic Higher Education, Islamic Religious Education, Quasi-Experimental Study.

Abstract
Critical thinking is an essential competence in higher education, yet its development in Islamic higher education is often challenged by learning practices that remain largely teacher-centered and content-oriented. This study aimed to examine the effect of Project-Based Learning on students' critical thinking skills in the Islamic Religious Education Study Program at Universitas Islam Internasional Darullughah Wadda'wah. A quantitative approach with a quasi-experimental pretest–posttest control group design was employed. The participants consisted of 64 undergraduate students, divided into an experimental group and a control group, with 32 students in each group. The experimental group was taught using Project-Based Learning over eight meetings, while the control group received conventional instruction. Data were collected using an essay-based critical thinking test covering interpretation, analysis, evaluation, inference, explanation, and reflection. The findings showed that students in the experimental group achieved higher posttest scores than those in the control group, indicating that Project-Based Learning had a significant positive effect on students' critical thinking skills. The strongest improvement was found in the reflection indicator, followed by interpretation, analysis, inference, evaluation, and explanation. This study contributes theoretically by positioning Project-Based Learning as a pedagogical framework that connects critical thinking development with Islamic higher education. It also offers practical implications for lecturers in designing contextual, collaborative, and reflective learning activities.

How to Cite this Article: Aminah, L., & Najmuddin, A. H. bin. (2026). The Effect of Project-Based Learning on Students' Critical Thinking Skills in Islamic Higher Education. *ELBASH : Journal of Social Science and Education*, *1*(1), 20–33.

INTRODUCTION

Higher education is increasingly expected to prepare students not only to master disciplinary knowledge but also to think critically, evaluate information, solve complex problems, and make responsible decisions in changing social and professional contexts. Critical thinking has therefore become one of the central learning outcomes in higher education, especially because students are required to analyze arguments, examine evidence, make judgments, and apply knowledge beyond classroom settings (Bezanilla et al., 2021; Rivas et al., 2023). In Islamic higher education, the need for critical thinking is even more significant because students are expected to connect Islamic knowledge, ethical values, and contemporary social realities in a reflective and problem-solving

Copyright © 2026 The Author(s)
This article is licensed under CC-BY-SA

manner. Recent studies in higher education also show that innovative pedagogical approaches are strongly associated with students' critical thinking and learning outcomes.

However, the development of students' critical thinking skills remains a continuing challenge in Islamic higher education. Learning practices in Islamic studies and Islamic religious education are often still associated with content transmission, textual understanding, and teacher-centered instruction, while students need more opportunities to investigate real problems, construct arguments, collaborate, and produce meaningful learning outputs. Amirudin et al. (2025), for example, note that conventional Islamic religious education may lack contextual relevance and may not sufficiently engage students in deeper religious understanding, critical thinking, and active learning. This condition indicates the need for learning models that can bridge Islamic knowledge with real-life issues and higher-order thinking processes.

One pedagogical approach that is considered relevant to this issue is Project-Based Learning. Project-Based Learning places students at the center of the learning process through investigation, collaboration, problem solving, and the production of concrete projects. Unlike conventional instruction that emphasizes the delivery of content, Project-Based Learning encourages students to identify problems, collect and analyze information, make decisions, and communicate their findings through authentic outputs. These learning activities are closely related to critical thinking because students are required to interpret information, evaluate alternatives, justify decisions, and reflect on the quality of their work.

Previous research has shown that Project-Based Learning can positively affect students' learning outcomes and thinking skills. A meta-analysis by Zhang and Ma (2023) found that Project-Based Learning had positive effects on students' learning outcomes, including thinking-related outcomes. Cortázar et al. (2021) also reported that an online project-based course could improve students' critical thinking, particularly when learning was supported by scaffolding. In higher education, Balleisen et al. (2024) found that applied project-based learning contributed to undergraduate student development, while Han et al. (2026) reported that project-based learning in graduate courses improved students' self-directed learning and research competencies. These studies suggest that Project-Based Learning is not only a teaching strategy but also a learning environment that can support students' intellectual development.

Recent literature further suggests that Project-Based Learning should be understood not only as an instructional technique but also as a comprehensive pedagogical design that supports authentic inquiry, collaboration, self-regulation, and transferable skill development. Reviews of project-based and problem-based learning in higher education show that these approaches are effective when students are involved in meaningful tasks, collaborative investigation, and structured problem solving, although their success depends on careful implementation and institutional support (Chen et al., 2021; Sukackė et al., 2022). Project-Based Learning has also been linked to the development of interpersonal competences, learning independence, computational thinking, and overall skill development in higher education (Crespí et al., 2022; Novalia et al., 2025; Pawar et al., 2026; Saad & Zainudin, 2022). These findings strengthen the argument that Project-Based Learning is relevant for developing critical thinking because it requires students to investigate complex issues, construct evidence-based explanations, collaborate with peers, and transform knowledge into meaningful academic products.

In Islamic education contexts, several recent studies have also examined active learning, problem-based learning, and project-based learning. Tambak and Siregar (2023) found that project-based learning contributed to the development of higher-order thinking skills among Islamic higher education students. Al Fikri et al. (2024) reported that the Project-Based Learning model improved students' critical reasoning and learning achievement in Islamic education based on Sustainable Development Goals values. Similarly, studies on problem-based learning in Islamic education have shown its potential to support students' Islamic religious comprehension, ijtihad skills, and contextual understanding (Abdul Khalil et al., 2024; Amirudin et al., 2025; Anshori, 2021). These findings indicate that student-centered learning models are increasingly relevant for Islamic higher education. In Islamic education, the need for contextual and reflective learning is increasingly emphasized because students are expected to connect religious knowledge with real-life educational, moral, and social issues. Parhan et al. (2024) argue that contextual learning in Islamic education can improve applicable knowledge and foster knowledge-based virtues, indicating that Islamic learning should move beyond abstract and memorization-oriented instruction. This perspective is consistent with broader evidence showing that innovative pedagogical approaches in higher education can improve students' critical thinking and learning outcomes (Bhuttah et al., 2024). Therefore, Project-Based Learning is theoretically relevant to Islamic higher education because it allows students to engage with Islamic concepts through contextual problems, collaborative inquiry, and reflective judgment rather than relying only on textual comprehension.

Nevertheless, several gaps remain in the existing literature. First, many studies on Project-Based Learning and critical thinking are conducted in general higher education, science education, engineering, language learning, or online learning contexts, while empirical research specifically situated in Islamic higher education is still limited. Second, studies in Islamic education often focus on learning achievement, higher-order thinking skills, religious understanding, or critical reasoning, but fewer studies directly measure students' critical thinking skills as the main outcome of Project-Based Learning. Third, systematic reviews have noted that research on problem-based and project-based learning still faces issues related to conceptual clarity, measurement of critical thinking, and methodological design (Loyens et al., 2023; Yu & Zin, 2023). Therefore, more empirical studies are needed to examine how Project-Based Learning affects students' critical thinking skills in Islamic higher education settings.

Based on these gaps, this study focuses on examining the effect of Project-Based Learning on students' critical thinking skills in Islamic higher education. The main problem addressed in this study is whether Project-Based Learning can significantly improve students' critical thinking skills compared with conventional or regular learning practices. Specifically, this study is guided by the following research questions: (1) What is the level of students' critical thinking skills before and after the implementation of Project-Based Learning? (2) Does Project-Based Learning have a significant effect on students' critical thinking skills in Islamic higher education? (3) Which indicators of critical thinking skills show the most noticeable improvement after the implementation of Project-Based Learning?

The scope of this study is limited to two main areas. First, the instructional scope focuses on the implementation of Project-Based Learning in an Islamic higher education learning context, particularly in a course or learning activity that allows students to connect Islamic knowledge with real-life issues. Second, the outcome scope focuses on students' critical thinking skills, such as

interpretation, analysis, inference, evaluation, explanation, and reflection. This study does not aim to measure all aspects of students' religious attitudes, character development, or long-term behavioral change. In addition, the study may be limited by the number of participants, institutional context, duration of treatment, and the instruments used to assess critical thinking.

This study is significant for several reasons. Theoretically, it contributes to the growing body of literature on Project-Based Learning and critical thinking by providing empirical evidence from the context of Islamic higher education. Practically, it offers insights for lecturers, curriculum developers, and Islamic higher education institutions in designing learning activities that are more student-centered, contextual, and intellectually challenging. Pedagogically, the study may help lecturers integrate Islamic values, real-world problems, collaborative inquiry, and project outputs into the learning process. For students, Project-Based Learning is expected to provide opportunities to practice argumentation, problem solving, reflection, and evidence-based decision making.

Therefore, the contribution of this study lies in its attempt to connect Project-Based Learning, critical thinking skills, and Islamic higher education in one empirical framework. While previous studies have shown the general effectiveness of Project-Based Learning, this study positions itself within the specific context of Islamic higher education and focuses directly on students' critical thinking skills. By doing so, the study is expected to provide both theoretical and practical contributions to the development of innovative pedagogy in Islamic higher education.

METHOD

This study employed a quantitative approach with a quasi-experimental pretest–posttest control group design. This design was selected because the study aimed to examine the effect of Project-Based Learning on students' critical thinking skills, while the participants were taken from existing classes and could not be randomly assigned individually. A quasi-experimental design is commonly used in educational intervention studies when intact classes are compared before and after treatment (Bulus, 2021). The study was conducted at the Islamic Religious Education Study Program, Universitas Islam Internasional Darullughah Wadda'wah, Indonesia.

The participants were undergraduate students of the Islamic Religious Education Study Program in the fourth semester of the 2025/2026 academic year. Two intact classes were selected using purposive sampling based on similar academic level, course content, and learning objectives. The total number of participants was 64 students. Class A, consisting of 32 students, was assigned as the experimental group and taught using Project-Based Learning, while Class B, consisting of 32 students, was assigned as the control group and taught using conventional instruction. The inclusion criteria were that students were officially enrolled in the selected course, actively participated in the learning process, and completed both the pretest and posttest.

The Project-Based Learning treatment was implemented over eight meetings. In the experimental group, learning activities were conducted through six stages: problem orientation, project planning, investigation, project development, presentation, and reflection. Students worked collaboratively in small groups to investigate contextual issues related to Islamic education, analyze information from relevant academic and Islamic sources, develop project outputs, and present their findings. The project outputs included analytical reports and group presentations related to contemporary issues in Islamic education. Project-Based Learning was selected because previous studies have shown that it can support student-centered learning, collaboration, problem solving,

and critical thinking development (Balleisen et al., 2024; Zhang & Ma, 2023). In the control group, learning was conducted through conventional instruction, including lecturer explanation, classroom discussion, question-and-answer activities, and individual assignments.

The research instrument was a critical thinking skills test consisting of six essay-based questions. The test was developed to measure six indicators of critical thinking: interpretation, analysis, evaluation, inference, explanation, and reflection. These indicators were adapted from the critical thinking framework proposed by Facione (1990), which defines critical thinking as purposeful and self-regulated judgment involving interpretation, analysis, evaluation, inference, explanation, and self-regulation. Students' answers were assessed using an analytic scoring rubric with a four-point scale, ranging from 1 = poor, 2 = fair, 3 = good, to 4 = excellent. The maximum score for the test was 24, and a higher score indicated stronger critical thinking performance.

Before being used in the main study, the instrument was validated by three experts consisting of one expert in Islamic education, one expert in educational evaluation, and one expert in learning methodology. The content validity was analyzed using Aiken's V to examine the relevance of each item to the critical thinking indicators (Kania et al., 2024). The validation results showed that the Aiken's V values ranged from 0.83 to 0.94, indicating that the items were valid and appropriate for measuring students' critical thinking skills. Minor revisions were made to improve the clarity of instructions and the contextual relevance of the essay questions.

A pilot test was conducted with 30 students who had similar characteristics to the research participants but were not included in the main sample. The reliability analysis showed that the critical thinking test had a Cronbach's alpha coefficient of 0.86, indicating good internal consistency. Since the instrument used essay-based responses, inter-rater reliability was also examined. Two raters independently assessed a sample of students' answers using the same scoring rubric, and the inter-rater reliability coefficient was 0.88, indicating a high level of scoring consistency. Cronbach's alpha was used as an estimate of internal consistency in educational measurement, while inter-rater reliability was used to ensure consistency in rubric-based assessment (Zakariya, 2022).

Data were collected through pretest and posttest. The pretest was administered to both the experimental and control groups before the treatment to measure students' initial critical thinking skills. After eight meetings of instruction, the posttest was administered to both groups to measure students' critical thinking performance after the learning intervention. The same indicators and scoring rubric were used in both the pretest and posttest to ensure consistency in measurement.

The data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to calculate the mean, standard deviation, minimum score, and maximum score of students' critical thinking skills. The Shapiro–Wilk test was used to examine data normality, while Levene's test was used to examine the homogeneity of variance. A paired samples t-test was used to analyze the improvement of students' critical thinking skills within each group, while an independent samples t-test was used to compare the posttest scores between the experimental and control groups. If the pretest scores showed significant differences, ANCOVA was used to control students' initial critical thinking ability. The effect size was calculated using Cohen's d, and the significance level was set at $p < .05$.

Ethical considerations were maintained throughout the study. Students were informed about the purpose of the research, the learning procedures, and the use of their data. Participation was

voluntary, and students' identities were kept confidential. The data were used only for academic purposes and reported in aggregate form.

RESULTS AND DISCUSSION

This study examined the effect of Project-Based Learning on students' critical thinking skills in the Islamic Religious Education Study Program, Universitas Islam Internasional Darullughah Wadda'wah. The data were collected from 64 undergraduate students, consisting of 32 students in the experimental group and 32 students in the control group. The experimental group was taught using Project-Based Learning, while the control group was taught using conventional instruction. Students' critical thinking skills were measured using six essay-based items covering interpretation, analysis, evaluation, inference, explanation, and reflection. These indicators were adapted from the critical thinking framework proposed by Facione, which identifies interpretation, analysis, evaluation, inference, explanation, and self-regulation as core cognitive skills of critical thinking.

Before hypothesis testing, normality and homogeneity tests were conducted. The Shapiro–Wilk test showed that the pretest and posttest scores in both groups were normally distributed, with significance values greater than .05. The Levene's test also showed that the variance between the experimental and control groups was homogeneous, both in the pretest and posttest. Therefore, the data met the assumptions for parametric statistical analysis.

Table 1. Normality and Homogeneity Test Results

Test	Group	Statistic	p-value	Interpretation
Shapiro–Wilk Pretest	Experimental	.962	.301	Normal
Shapiro–Wilk Posttest	Experimental	.971	.529	Normal
Shapiro–Wilk Pretest	Control	.958	.242	Normal
Shapiro–Wilk Posttest	Control	.966	.391	Normal
Levene's Test Pretest	Both groups	.097	.757	Homogeneous
Levene's Test Posttest	Both groups	.813	.371	Homogeneous

The descriptive analysis showed that the experimental group experienced a greater improvement in critical thinking skills than the control group. The mean pretest score of the experimental group was 12.83, while the mean posttest score increased to 19.23. Meanwhile, the control group obtained a mean pretest score of 12.72 and a mean posttest score of 15.36. This indicates that both groups improved after instruction, but the improvement in the experimental group was substantially higher.

Table 2. Descriptive Statistics of Students' Critical Thinking Skills

Group	N	Pretest Mean	SD	Posttest Mean	SD	Mean Gain
Experimental	32	12.83	2.14	19.23	2.07	6.40
Control	32	12.72	2.08	15.36	2.20	2.64

The independent samples t-test on the pretest scores showed no significant difference between the experimental and control groups, $t(62) = 0.21$, $p = .834$. This means that both groups had relatively similar initial critical thinking skills before the treatment. However, the posttest comparison showed a significant difference between the two groups, $t(62) = 7.25$, $p < .001$. The effect

size, measured using Cohen's d, was 1.81, indicating a large effect. These results suggest that Project-Based Learning had a significant and strong effect on students' critical thinking skills.

Table 3. Independent Samples t-Test Results

Test	Mean Difference	t	df	p-value	Cohen's d	Interpretation
Pretest	0.11	0.21	62	.834	0.05	Not significant
Posttest	3.87	7.25	62	< .001	1.81	Significant, large effect

The paired samples t-test was also conducted to examine the improvement within each group. The experimental group showed a significant improvement from pretest to posttest, $t(31) = 11.28$, $p < .001$. The control group also showed a significant improvement, $t(31) = 5.34$, $p < .001$, but the mean gain was lower than that of the experimental group. This indicates that conventional instruction still contributed to students' learning, but Project-Based Learning produced a stronger improvement in critical thinking skills.

Table 4. Paired Samples t-Test Results

Group	Mean Gain	t	df	p-value	Interpretation
Experimental	6.40	11.28	31	< .001	Significant improvement
Control	2.64	5.34	31	< .001	Significant improvement

An analysis of students' critical thinking indicators showed that the experimental group improved in all six indicators. The highest improvement was found in reflection, followed by interpretation, analysis, inference, evaluation, and explanation. This result indicates that Project-Based Learning encouraged students not only to understand and analyze learning problems but also to evaluate information, draw conclusions, explain their reasoning, and reflect on their learning process.

Table 5. Mean Scores of Critical Thinking Indicators

Indicator	Experimental Pretest	Experimental Posttest	Gain	Control Pretest	Control Posttest	Gain
Interpretation	2.20	3.31	1.11	2.17	2.66	0.49
Analysis	2.11	3.22	1.11	2.08	2.52	0.44
Evaluation	2.04	3.10	1.06	2.03	2.43	0.40
Inference	2.18	3.25	1.07	2.15	2.55	0.40
Explanation	2.23	3.06	0.83	2.22	2.59	0.37
Reflection	2.07	3.29	1.22	2.07	2.61	0.54

Overall, the results indicate that Project-Based Learning significantly improved students' critical thinking skills in Islamic higher education. The large effect size suggests that the difference was not only statistically significant but also educationally meaningful.

The findings of this study indicate that Project-Based Learning had a significant positive effect on students' critical thinking skills in the Islamic Religious Education Study Program at Universitas Islam Internasional Darullughah Wadda'wah. Students in the experimental group achieved higher posttest scores than those in the control group, although both groups showed relatively similar pretest scores. This pattern suggests that the improvement in students' critical thinking skills was more closely associated with the implementation of Project-Based Learning than with differences in

students' initial ability. The large effect size also indicates that the difference was not only statistically significant but also educationally meaningful.

This finding can be explained through the learning structure of Project-Based Learning. In this model, students are not positioned merely as recipients of information but as active learners who identify problems, design project plans, investigate relevant sources, construct arguments, produce learning outputs, and reflect on the process. These activities are closely aligned with the cognitive dimensions of critical thinking, particularly interpretation, analysis, evaluation, inference, explanation, and self-regulation. Facione (1990) defines critical thinking as purposeful and self-regulated judgment that involves interpretation, analysis, evaluation, inference, explanation, and self-regulation. Therefore, when students are required to investigate real problems and justify their conclusions through project work, they are directly trained to practice the core elements of critical thinking.

The effectiveness of Project-Based Learning in this study is also supported by research emphasizing the importance of collaboration, teacher facilitation, and scaffolding in project-based environments. Online and blended project-based learning studies show that students' motivation, collaborative learning strategies, teaching presence, and cognitive engagement are important factors in shaping learning outcomes (Admiraal et al., 2026; Guo et al., 2022). Similarly, studies on critical thinking development through project-based and blended learning indicate that students develop stronger reasoning when learning activities require them to analyze information, communicate arguments, evaluate evidence, and revise their understanding through feedback (Ivancu et al., 2023; Wang, 2022). These findings help explain why students in the experimental group showed stronger improvement: they were not only exposed to course content but were also required to negotiate meaning, justify decisions, and refine their project outputs through collaborative and reflective processes.

The result of this study is consistent with recent empirical evidence showing that Project-Based Learning improves students' learning outcomes and higher-order thinking. Zhang and Ma (2023), in a meta-analysis, found that Project-Based Learning has a positive impact on students' learning effects, including academic achievement, motivation, and higher-order thinking. Their findings are relevant to the present study because the improvement in students' critical thinking skills occurred after they participated in structured project activities over several meetings. Similarly, Balleisen et al. (2024) reported that applied project-based learning contributes to undergraduate student development by providing opportunities for students to engage in inquiry, collaboration, and applied academic work. These studies support the argument that Project-Based Learning strengthens critical thinking because it places students in learning situations that require active reasoning, decision making, and evidence-based problem solving.

The present findings also align with the systematic review conducted by Loyens et al. (2023), who emphasized that problem-based and project-based learning environments can foster higher-order, critical, and critical-analytic thinking because they expose students to problems, collaboration, and inquiry-based learning processes. This is important because critical thinking does not develop only through the delivery of theoretical content; rather, it requires instructional environments that challenge students to question assumptions, examine evidence, and construct reasoned judgments. In this study, the Project-Based Learning model provided such an environment by requiring students

to connect Islamic education materials with contextual issues, develop project outputs, and present their arguments before peers and the lecturer.

The positive effect of Project-Based Learning in this study can also be understood from the perspective of active learning and student engagement. Bezanilla et al. (2021) argued that critical thinking is a central competence in higher education and that active methodologies are needed to develop it effectively. In conventional instruction, students may understand concepts, but their opportunities to question, evaluate, and reconstruct knowledge are often limited. In contrast, Project-Based Learning allows students to participate in deeper learning activities because they must transform information into project-based outputs. This transformation process encourages students to move from remembering and understanding toward analyzing, evaluating, and creating.

In the context of Islamic higher education, the findings are particularly meaningful. Students of Islamic Religious Education are expected not only to understand Islamic concepts textually but also to apply them critically in responding to contemporary educational, moral, social, and religious issues. Project-Based Learning supports this aim because it allows students to integrate Islamic values with real-life problem solving. This finding is in line with Tambak and Siregar (2023), who found that project-based learning influenced higher-order thinking skills among students in an Islamic Religious Education Study Program. It is also supported by Al Fikri et al. (2024), who reported that Project-Based Learning improved students' critical reasoning and learning achievement in Islamic education. These studies indicate that Project-Based Learning is relevant not only for general higher education but also for Islamic education, particularly when the learning process requires students to analyze contextual problems through Islamic perspectives.

The improvement in the reflection indicator was the highest among the six indicators of critical thinking. This suggests that Project-Based Learning encouraged students to reconsider their assumptions, evaluate their learning process, and revise their understanding after receiving feedback. Reflection became stronger because students were involved in project planning, collaborative investigation, presentation, and evaluation. This result is consistent with Cortázar et al. (2021), who found that project-based learning can support the development of critical thinking, especially when students receive scaffolding and feedback during collaborative learning. In this study, reflection occurred not only at the end of the learning process but throughout the project stages, as students had to revise ideas, respond to peer feedback, and improve their project outputs.

The improvement in interpretation, analysis, inference, and evaluation also shows that Project-Based Learning strengthened students' ability to understand problems, identify relevant information, compare arguments, and draw conclusions based on evidence. These skills are essential in Islamic Religious Education because students need to evaluate religious, educational, and social issues carefully rather than accepting information passively. In this sense, Project-Based Learning helped students move from textual comprehension to analytical and contextual reasoning. This supports Liu and Pásztor's (2022) meta-analysis, which found that problem-centered instructional interventions can significantly improve critical thinking in higher education. Although Problem-Based Learning and Project-Based Learning are not identical, both approaches share core features such as inquiry, collaboration, problem solving, and reflective learning.

The control group also showed improvement, but the gain was lower than that of the experimental group. This indicates that conventional instruction may still support learning, especially when lecturers provide explanations, discussions, and assignments. However, the

improvement tends to be more limited because students are less exposed to sustained inquiry, collaborative project development, and authentic problem solving. The difference between the two groups suggests that critical thinking develops more effectively when students are given structured opportunities to engage in investigation, argumentation, decision making, and reflection. This is consistent with Wijnia et al. (2024), who noted that student-centered, problem-driven learning methods such as problem-based, project-based, and case-based learning can influence student motivation and engagement, although their effectiveness depends on implementation quality.

These findings contribute to the literature in several ways. First, this study provides empirical support for the effectiveness of Project-Based Learning in improving students' critical thinking skills in Islamic higher education. Previous research has widely examined Project-Based Learning in general education, science education, engineering, and online learning contexts, but studies focusing specifically on Islamic Religious Education in higher education remain more limited. Second, this study extends previous research by focusing directly on critical thinking skills rather than only learning achievement or general higher-order thinking skills. Third, the study demonstrates that Project-Based Learning can be used as a pedagogical bridge between Islamic knowledge, contemporary issues, collaborative inquiry, and reflective reasoning.

The findings also have practical implications for lecturers in Islamic Religious Education. Lecturers should not rely only on lecture-based instruction if the learning objective is to develop students' critical thinking. Instead, they can design project-based activities that require students to investigate real educational or social problems, analyze them using Islamic perspectives, and produce academic outputs such as analytical reports, presentations, reflective essays, or community-based projects. Such activities can help students develop the ability to evaluate evidence, construct arguments, and apply Islamic values in contextual decision making. In this way, Project-Based Learning can support the preparation of future Islamic education teachers who are not only knowledgeable but also reflective, analytical, and socially responsive.

The findings also indicate that the success of Project-Based Learning depends on the quality of instructional design and the learning culture created by lecturers. Saavedra and Rapaport (2024) emphasize that effective project-based teaching requires high-quality materials, professional learning support, and a learning culture that enables students to engage meaningfully with inquiry-based tasks. Other studies also show that project-based and problem-based learning may face challenges related to group management, student readiness, task complexity, assessment clarity, and teacher preparation (Salvador et al., 2023; Zaafour & Salaberri-Ramiro, 2022). Moreover, students' positive attitudes, engagement, and perceptions of learning are important conditions for successful Project-Based Learning implementation (Ospankulova et al., 2025). Therefore, the strong effect found in this study should be interpreted not merely as the result of using Project-Based Learning as a method, but as the result of structured project stages, clear assessment criteria, collaborative learning opportunities, and reflective feedback.

Despite its contribution, this study has several limitations. First, the study involved only two classes from one Islamic higher education institution, so the findings should be generalized carefully. Second, the treatment was conducted over eight meetings, which may not fully capture the long-term effect of Project-Based Learning on students' critical thinking skills. Third, this study focused on critical thinking skills measured through essay-based tests, while other important outcomes such as religious attitude, creativity, communication, collaboration, and ethical reasoning were not

examined. Future studies are recommended to involve larger samples, longer intervention periods, mixed-method designs, and broader outcome variables. Future research may also compare Project-Based Learning with other student-centered models, such as Problem-Based Learning, inquiry learning, or case-based learning, to identify which pedagogical strategies are most effective for strengthening critical thinking in Islamic higher education.

Overall, this study confirms that Project-Based Learning is an effective instructional model for improving students' critical thinking skills in Islamic higher education. The model is effective because it provides structured opportunities for students to investigate problems, evaluate information, construct arguments, produce project outputs, and reflect on their learning process. Therefore, Project-Based Learning can be considered a relevant pedagogical approach for strengthening critical thinking among students of the Islamic Religious Education Study Program at Universitas Islam Internasional Darullughah Wadda'wah.

CONCLUSION

This study concludes that Project-Based Learning has a positive effect on students' critical thinking skills in the Islamic Religious Education Study Program at Universitas Islam Internasional Darullughah Wadda'wah. The findings show that students who learned through Project-Based Learning demonstrated stronger improvement in interpretation, analysis, evaluation, inference, explanation, and reflection than students who learned through conventional instruction. The theoretical novelty of this study lies in its attempt to position Project-Based Learning not merely as an active learning strategy, but as a pedagogical framework that connects critical thinking development with Islamic higher education. By integrating project activities, contextual Islamic issues, collaborative inquiry, and reflective learning, this study contributes to the expansion of critical thinking theory within a religious higher education context.

The contextual contribution of this study is its focus on Islamic higher education, particularly in the field of Islamic Religious Education, where students are expected to understand Islamic knowledge critically and apply it to contemporary educational and social problems. Practically, the findings imply that lecturers can use Project-Based Learning to design more active, contextual, and reflective learning experiences, such as analytical projects, case-based investigations, community-related assignments, and collaborative presentations. However, this study is limited by its sample size, institutional scope, intervention duration, and focus on essay-based critical thinking assessment. Future research should involve larger and more diverse samples, longer treatment periods, mixed-method designs, and additional variables such as creativity, collaboration, religious moderation, digital literacy, and ethical reasoning. In the long term, Project-Based Learning has the potential to become a transformative pedagogical model for preparing Islamic higher education students to become critical, reflective, and socially responsible Muslim intellectuals.

REFERENCES

Abdul Khalil, S., Mohd Razif, N. F., & Rosele, M. I. (2024). Developing ijtihad skills for undergraduate students through problem-based learning in fiqh subjects: Present practices and the way forward. *Asia Pacific Journal of Educators and Education, 39*(2), 197–217. https://doi.org/10.21315/apjee2024.39.2.11

Admiraal, W., Saab, N., & Guo, P. (2026). Online collaborative project-based learning in higher education: Students' motivation, collaborative learning, and perceived outcomes. *Active Learning in Higher Education*, 1–16. https://doi.org/10.1177/14697874261419448

Al Fikri, D. I., Wachidi, & Shobahiya, M. (2024). The effect of the Project-Based Learning (PjBL) model on students' critical reasoning and learning achievement in Islamic education based on the SDGs. *Profetika: Jurnal Studi Islam, 25*(2), 547–566. https://doi.org/10.23917/profetika.v25i02.7556

Amirudin, A., Muzaki, I. A., & Nurhayati, S. (2025). Problem-Based Learning as a pedagogical innovation for transforming higher education students' Islamic religious comprehension. *Educational Process: International Journal, 18*, Article e2025412. https://doi.org/10.22521/edupij.2025.18.412

Anshori, I. (2021). Problem-Based Learning remodelling using Islamic values integration and sociological research in madrasas. *International Journal of Instruction, 14*(2), 421–442. https://doi.org/10.29333/iji.2021.14224a

Balleisen, E. J., Howes, L., & Wibbels, E. (2024). The impact of applied project-based learning on undergraduate student development. *Higher Education, 87*(4), 1141–1156. https://doi.org/10.1007/s10734-023-01057-1

Bezanilla, M. J., Galindo-Domínguez, H., & Poblete, M. (2021). Importance of teaching critical thinking in higher education and existing difficulties according to teacher's views. *REMIE: Multidisciplinary Journal of Educational Research, 11*(1), 20–48. https://doi.org/10.17583/REMIE.0.6159

Bhuttah, T. M., Xusheng, Q., Abid, M. N., & Sharma, S. (2024). Enhancing student critical thinking and learning outcomes through innovative pedagogical approaches in higher education: The mediating role of inclusive leadership. *Scientific Reports, 14*, Article 24362. https://doi.org/10.1038/s41598-024-75379-0

Bulus, M. (2021). Sample size determination and optimal design of randomized/non-equivalent pretest-posttest control-group designs. *Adıyaman University Journal of Educational Sciences, 11*(1), 48–69. https://doi.org/10.17984/adyuebd.941434

Chen, J., Kolmos, A., & Du, X. (2021). Forms of implementation and challenges of PBL in engineering education: A review of literature. *European Journal of Engineering Education, 46*(1), 90–115. https://doi.org/10.1080/03043797.2020.1718615

Cortázar, C., Nussbaum, M., Harcha, J., Alvares, D., López, F., Goñi, J., & Cabezas, V. (2021). Promoting critical thinking in an online, project-based course. *Computers in Human Behavior, 119*, Article 106705. https://doi.org/10.1016/j.chb.2021.106705

Crespí, P., García-Ramos, J. M., & Queiruga-Dios, M. (2022). Project-Based Learning (PBL) and its impact on the development of interpersonal competences in higher education. *Journal of New Approaches in Educational Research, 11*(2), 259–276. https://doi.org/10.7821/naer.2022.7.993

Facione, P. A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction*. American Philosophical Association. https://files.eric.ed.gov/fulltext/ED315423.pdf

Guo, P., Saab, N., Ren, D., & Admiraal, W. (2022). The community of inquiry perspective on teachers' role and students' evaluations of online project-based learning. *Online Learning, 26*(4). https://doi.org/10.24059/olj.v26i4.3193

Han, F., Xu, J., Peng, Y., & Yu, C. (2026). The application of project-based learning in graduate courses: A case study in China. *Frontiers in Education, 11*, Article 1670780. https://doi.org/10.3389/feduc.2026.1670780

Ivancu, O., Kriaučiūnienė, R., & Poštić, S. (2023). Implementation of the critical thinking blended apprenticeship curricula and findings per discipline: Foreign language teaching. *Education Sciences, 13*(2), Article 208. https://doi.org/10.3390/educsci13020208

Kania, N., Kusumah, Y. S., Dahlan, J. A., Nurlaelah, E., Gürbüz, F., & Bonyah, E. (2024). Constructing and providing content validity evidence through the Aiken's V index based on the experts' judgments of the instrument to measure mathematical problem-solving skills. *REID (Research and Evaluation in Education), 10*(1), 64–79. https://doi.org/10.21831/reid.v10i1.71032

Liu, Y., & Pásztor, A. (2022). Effects of problem-based learning instructional intervention on critical thinking in higher education: A meta-analysis. *Thinking Skills and Creativity, 45*, Article 101069. https://doi.org/10.1016/j.tsc.2022.101069

Loyens, S. M. M., Van Meerten, J. E., Schaap, L., & Wijnia, L. (2023). Situating higher-order, critical, and critical-analytic thinking in problem- and project-based learning environments: A systematic review. *Educational Psychology Review, 35*, Article 39. https://doi.org/10.1007/s10648-023-09757-x

Novalia, R., Marini, A., Bintoro, T., & Muawanah, U. (2025). Project-based learning: For higher education students' learning independence. *Social Sciences & Humanities Open, 11*, Article 101530. https://doi.org/10.1016/j.ssaho.2025.101530

Ospankulova, E., Maxutov, S., Lathrop, R., Anuarova, L., & Balta, N. (2025). Science students' attitudes, learning, critical thinking and engagement in project-based learning. *Cogent Education, 12*(1), Article 2445358. https://doi.org/10.1080/2331186X.2024.2445358

Parhan, M., Syahidin, S., Somad, M. A., Abdulah, M., & Nugraha, R. H. (2024). Developing a contextual learning model in Islamic education to improve applicable knowledge and foster knowledge-based virtues. *Jurnal Pendidikan Islam, 10*(1), 75–86. https://doi.org/10.15575/jpi.v10i1.35205

Pawar, V. S., Desai, G. T., & Borotikar, M. (2026). Evaluating the impact of a project-based learning framework on overall skill development. *Frontiers in Education, 11*, Article 1780665. https://doi.org/10.3389/feduc.2026.1780665

Rivas, S. F., Saiz, C., & Almeida, L. S. (2023). The role of critical thinking in predicting and improving academic performance. *Sustainability, 15*(2), Article 1527. https://doi.org/10.3390/su15021527

Saad, A., & Zainudin, S. (2022). A review of Project-Based Learning (PBL) and computational thinking (CT) in teaching and learning. *Learning and Motivation, 78*, Article 101802. https://doi.org/10.1016/j.lmot.2022.101802

Saavedra, A. R., & Rapaport, A. (2024). Key lessons from research about project-based teaching and learning. *Phi Delta Kappan, 105*(5), 19–25. https://doi.org/10.1177/00317217241230780

Salvador, R., Barros, M. V., Barreto, B., Pontes, J., Yoshino, R. T., Piekarski, C. M., & de Francisco, A. C. (2023). Challenges and opportunities for problem-based learning in higher education:

Lessons from a cross-program Industry 4.0 case. *Industry and Higher Education, 37*(1), 3–21. https://doi.org/10.1177/09504222221100343

Sukackė, V., Guerra, A. O. P. C., Ellinger, D., Carlos, V., Petronienė, S., Gaižiūnienė, L., Blanch, S., Marbà-Tallada, A., & Brose, A. (2022). Towards active evidence-based learning in engineering education: A systematic literature review of PBL, PjBL, and CBL. *Sustainability, 14*(21), Article 13955. https://doi.org/10.3390/su142113955

Tambak, S., & Siregar, R. (2023). Development of higher order thinking skills through project-based learning methods. *Halaqa: Islamic Education Journal, 7*(1), 45–56. https://doi.org/10.21070/halaqa.v7i1.1623

Wang, S. (2022). Critical thinking development through project-based learning. *Journal of Language Teaching and Research, 13*(5), 1007–1013. https://doi.org/10.17507/jltr.1305.13

Wijnia, L., Noordzij, G., Arends, L. R., Rikers, R. M. J. P., & Loyens, S. M. M. (2024). The effects of problem-based, project-based, and case-based learning on students' motivation: A meta-analysis. *Educational Psychology Review, 36*, Article 29. https://doi.org/10.1007/s10648-024-09864-3

Yu, L., & Zin, Z. M. (2023). The critical thinking-oriented adaptations of problem-based learning models: A systematic review. *Frontiers in Education, 8*, Article 1139987. https://doi.org/10.3389/feduc.2023.1139987

Zaafour, A., & Salaberri-Ramiro, M. S. (2022). Incorporating cooperative project-based learning in the teaching of English as a foreign language: Teachers' perspectives. *Education Sciences, 12*(6), Article 388. https://doi.org/10.3390/educsci12060388

Zakariya, Y. F. (2022). Cronbach's alpha in mathematics education research: Its appropriateness, overuse, and alternatives in estimating scale reliability. *Frontiers in Psychology, 13*, Article 1074430. https://doi.org/10.3389/fpsyg.2022.1074430

Zhang, L., & Ma, Y. (2023). A study of the impact of project-based learning on student learning effects: A meta-analysis study. *Frontiers in Psychology, 14*, Article 1202728. https://doi.org/10.3389/fpsyg.2023.1202728