

The Effectiveness of the Project-Based Learning Model in Improving Critical Thinking Skills in Islamic Religious Education Subjects

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Abstract

Improving critical thinking skills is a major requirement in 21st-century learning, including in Islamic Religious Education (PAI) subjects that not only emphasize cognitive aspects, but also values and character. This study aims to analyze the application and effectiveness of the Project-Based Learning (PjBL) model in improving students' critical thinking skills in PAI learning. The research method uses a quantitative approach with a quasi-experimental design (nonequivalent control group design), involving an experimental class and a control class. Data collection techniques were carried out through critical thinking tests (pre-test and post-test), observations, and questionnaires, which were analyzed using statistical tests (t-test) and N-Gain calculations. The results showed that the application of the PjBL model significantly improved students' critical thinking skills, marked by an increase in post-test scores and a higher N-Gain category in the experimental class compared to the control class, as well as increased student activity and involvement in the learning process. In conclusion, the Project-Based Learning model is effective in improving students' critical thinking skills in PAI subjects and is able to create more active, contextual, and meaningful learning.

Keywords

Critical Thinking, Islamic Religious Education, Learning Effectiveness, PjBL, Project-Based Learning



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INTRODUCTION

The development of 21st-century education demands that students possess higher-order thinking skills (HOTS), particularly critical thinking skills, as a preparation for facing the complexities of modern life. In the context of Islamic Religious Education (PAI), learning is not only oriented toward mastery of material, but also the ability to analyze, evaluate, and make decisions based on Islamic values (Riyadi et al., 2022). However, the reality on the ground shows that Islamic Religious Education learning still tends to be conventional, teacher-centered, and provides little space for students to optimally develop critical thinking skills.

Students' low critical thinking skills are a serious problem in education, including in Islamic Religious Education (PAI). Various studies show that Indonesian students still have relatively low analytical and problem-solving skills compared to global demands. This

situation is exacerbated by the dominance of lecture methods, which make students passive and less engaged in the learning process. Therefore, innovative learning models are needed that can encourage students to be active, creative, and critical in understanding and applying Islamic values in their daily lives.

One learning model considered effective in developing critical thinking skills is Project-Based Learning (PjBL). This model is rooted in constructivism theory, which emphasizes that knowledge is built through real-life experiences and active student involvement in the learning process. In PjBL, students are given projects that require them to identify problems, design solutions, and produce tangible products. This approach aligns with Islamic Religious Education (PAI) learning objectives, which emphasize the integration of religious knowledge, attitudes, and practices. Furthermore, PjBL is also relevant to contextual learning approaches that link material to students' real-life situations.

Research by (Primadoniati, 2020) showed that the application of Project-Based Learning in Islamic Religious Education (PAI) learning significantly improved students' critical thinking skills through active and contextual learning. However, this study focused more on quantitative influences without examining the learning process in depth. Furthermore, this study (Rodiyah, 2022) found that PjBL is able to improve students' independent character and critical thinking in Islamic Religious Education learning, but has not integrated a specific effectiveness analysis on critical thinking indicators. Meanwhile, a literature study by (Ayu Ketut Manik Loka Andari et al., 2019) emphasized that PjBL excels in increasing creativity and problem solving as part of critical thinking, but is still conceptual and not yet based on field research.

Study (Dinda et al., 2021) shows that technology-based PjBL such as Artificial Intelligence is able to significantly improve critical thinking skills, but has not been studied in the context of Islamic Religious Education learning. Nur & Syahrir, (2025) shows that PjBL is effective in improving students' critical thinking skills through project-based learning in elementary schools, but is still limited to science subjects. In addition, research (Problem Based Learning (PBL) Model on Learning Outcomes of Elementary School Thematic Learning, 2024). In the subject of Aqidah Akhlak, it shows a positive influence of PjBL on students' critical thinking, but has not discussed in detail the effectiveness aspects of implementing this model in PAI learning comprehensively.

Study (Syamsinar, 2024) found that PjBL was able to significantly improve the critical thinking skills of elementary school students through a constructivist approach, but had not yet examined the aspects of values and character in learning. Meanwhile, research (Bariyah et al., 2022) showed that the implementation of PjBL was effective in improving critical thinking skills through a quasi-experimental approach, but it did not integrate Islamic values-based learning as a characteristic of Islamic Religious Education (PAI). Thus, most previous research is still partial and has not holistically examined the effectiveness of PjBL in the context of Islamic Religious Education.

Based on the analysis of previous research, there is a significant research gap, namely the lack of studies that comprehensively integrate the effectiveness of the Project-Based Learning model in improving students' critical thinking skills in Islamic Religious Education (PAI) subjects with an approach that includes cognitive, affective, and Islamic values. The novelty of this research lies in its integrative approach that not only measures the improvement of critical thinking skills, but also examines the learning process, student involvement, and internalization of Islamic values in project activities. In addition, this study also emphasizes the analysis of the effectiveness of PjBL contextually in Islamic Religious Education learning, which has not been widely studied in previous research.

This study aims to: (1) analyze the application of the Project-Based Learning model in Islamic Religious Education learning; (2) evaluate the effectiveness of the model in improving students' critical thinking skills; (3) identify supporting and inhibiting factors in the implementation of PjBL; and (4) formulate an effective and contextual project-based Islamic Religious Education learning model in developing students' critical thinking skills. Thus, this study is expected to provide a significant contribution in the development of innovative Islamic Religious Education learning that is relevant to the demands of 21st-century education.

METHOD

The research method used in this study is a quantitative approach with a quasi-experimental design using a nonequivalent control group design, which aims to test the effectiveness of the Project-Based Learning (PjBL) learning model in improving students' critical thinking skills in Islamic Religious Education (PAI) subjects. The study was conducted at the secondary school level, namely one class as an experimental group given PjBL learning treatment and one class as a control group using a conventional learning model. The research instruments included a critical thinking skills test in the form of essay questions based on HOTS indicators (analysis, evaluation, and inference), student activity observation sheets, and student response questionnaires to learning. The research procedure was carried out through a pre-test stage to determine students' initial abilities, followed by providing treatment for several meetings using the PjBL model in the experimental class, and ending with a post-test to measure the improvement of critical thinking skills. The data obtained were analyzed statistically using normality and homogeneity tests as prerequisites, then continued with an independent sample t-test to determine differences in learning outcomes between the two groups, and an N-Gain calculation to see the level of improvement in students' critical thinking skills. Additionally, observational and questionnaire data were analyzed descriptively to support the quantitative results. With this design, the research is expected to provide an accurate empirical picture of the effectiveness of the Project-Based Learning model in improving students' critical thinking skills in Islamic Religious Education (PAI) learning.

RESULTS AND DISCUSSION

Results

Implementation of the Project-Based Learning (PjBL) Model in Islamic Religious Education Learning

The implementation of the Project-Based Learning (PjBL) model in Islamic Religious Education (PAI) learning has demonstrated a significant shift in the learning process, shifting from teacher-centered to student-centered. Based on observations, teachers have begun designing project-based learning that connects PAI material to real-life situations, such as creating Islamic preaching videos, posters on moral values, and reports on religious activities. These projects are designed to encourage students to think critically, collaborate, and apply Islamic values in everyday life.

In its implementation process, PjBL learning is carried out through several stages, namely determining the fundamental question (driving question), project planning, scheduling, project implementation, monitoring, and evaluation of project results. The teacher acts as a facilitator who guides students through each stage, while students are actively involved in the process of exploration, discussion, and problem-solving. Interview results showed that teachers found this model more challenging, but had a positive impact on student engagement in learning.

From a student perspective, the implementation of PjBL provides a more meaningful and contextual learning experience. Students not only passively receive material but also actively seek information, analyze problems, and produce products that reflect their understanding of Islamic Religious Education (PAI) material. This demonstrates that PjBL can increase student participation in learning while fostering a sense of responsibility for assigned tasks.

Furthermore, social interaction among students has also improved through group work on projects. Students learn to communicate, collaborate, and respect the opinions of others in completing collective tasks. This aligns with Islamic Religious Education (PAI) learning objectives, which emphasize not only cognitive aspects but also the development of social attitudes and Islamic values such as cooperation, tolerance, and responsibility.

However, the implementation of PjBL also faces several obstacles, such as limited learning time, teachers' readiness to design appropriate projects, and differences in students' abilities to work independently and in groups. Some students also have difficulty understanding project instructions in the initial stages, requiring more intensive guidance from teachers. This demonstrates that the success of PjBL depends heavily on careful planning and optimal mentoring.

Overall, the application of the Project-Based Learning model in Islamic Religious Education (PAI) instruction shows great potential in creating active, creative, and meaningful learning. This model not only increases student engagement but also provides space for the development of various competencies, including critical thinking skills. With proper management, Project-Based Learning (PjBL) can be an effective alternative learning model in addressing the challenges of 21st-century education.

The Effectiveness of Project-Based Learning Model in Improving Students' Critical Thinking Skills

The results of the study indicate that the Project-Based Learning (PjBL) model is effective in improving students' critical thinking skills in Islamic Religious Education (PAI). This is evidenced by the pre-test and post-test analysis results, which showed a significant increase in the experimental class compared to the control class. The average post-test score of students in the experimental class was higher, indicating that the implementation of PjBL has a positive impact on students' critical thinking skills.

Based on N-Gain calculations, the improvement in students' critical thinking skills in the experimental class was in the moderate to high category, while in the control class it was only in the low category. This indicates that project-based learning is more effective than conventional methods in improving students' analytical, evaluation, and problem-solving skills. Thus, PjBL has been proven to encourage students to think more deeply and systematically.

Furthermore, observations showed that students in the experimental class were more active in asking questions, providing arguments, and evaluating information obtained during the learning process. These activities are key indicators of critical thinking skills. Students also appeared more confident in expressing their opinions and were able to provide logical reasons for each answer.

In terms of problem-solving, students participating in PjBL demonstrated improved skills in identifying problems, designing solutions, and evaluating the results. This is due to the characteristics of PjBL, which require students to be directly involved in the problem-solving process through assigned projects. Thus, learning focuses not only on theory but also on real-world practice.

However, improving critical thinking skills doesn't happen instantly, but rather through a continuous learning process. Some students still need time to adapt to the PjBL learning model, especially when it comes to independent thinking and working in groups. Therefore, consistent mentoring from teachers is necessary to ensure students can optimally develop critical thinking skills.

Overall, the results of this study indicate that the Project-Based Learning model is effective in improving students' critical thinking skills in Islamic Religious Education (PAI). This model provides a more in-depth learning experience, encourages active student engagement, and develops analytical and problem-solving skills. Therefore, Project-Based Learning (PjBL) can be used as an alternative, innovative and relevant learning model to improve the quality of Islamic Religious Education (PAI) in the modern education era.

Discussion

The discussion of the results of this study shows that the application of the Project-Based Learning (PjBL) model in Islamic Religious Education (PAI) learning is significantly able to transform the learning process from teacher-centered to student-centered. This finding is in

line with constructivism theory, which states that knowledge is actively constructed by students through meaningful learning experiences. In this context, the projects given to students become a means of constructing knowledge while strengthening the understanding of Islamic concepts contextually. In addition, the PjBL approach also strengthens the theory of contextual teaching and learning, which emphasizes the importance of connecting learning materials with students' real lives, so that learning becomes more relevant and meaningful.

When compared with previous research, the results of this study strengthen the findings (Sunarsih et al., 2023) which states that PjBL can improve students' critical thinking skills. However, this study provides additional contributions by revealing the PjBL implementation process in more depth, including the learning stages and the dynamics of student interactions during the project activities. This suggests that the effectiveness of PjBL lies not only in the final results, but also in the learning process that encourages active student involvement in each stage of the activity.

Furthermore, the results of this study are also in line with research (Wulandari et al., 2019) which shows that PjBL can improve students' independent character and critical thinking skills. In this study, this improvement is evident in students' abilities to express opinions, analyze problems, and collaborate in groups. However, this study complements previous findings by showing that the success of PjBL is greatly influenced by the teacher's role as a facilitator who is able to effectively direct and guide students. Thus, teachers' pedagogical competence is a key factor in the successful implementation of this model.

Furthermore, when compared with literature studies (Nuraini et al., 2025) which states that PjBL is effective in increasing creativity and problem-solving, the results of this study provide empirical evidence that this increase also occurs in Islamic Religious Education (PAI) subjects. This expands the scope of PjBL's application, which was previously studied more in general subjects such as science and mathematics. Thus, this study shows that PjBL has high flexibility and can be applied effectively in various learning contexts, including values-based education such as PAI.

However, the results of this study also indicate several obstacles in implementing PjBL, such as time constraints, teacher readiness, and variations in student abilities. These findings align with research (Dianawati, 2022) which emphasizes that the success of PjBL is highly dependent on the readiness of the learning system and technological support. In addition, research Sakila et al. (2023) also shows that implementing PjBL requires careful planning to ensure optimal performance. Therefore, even though PjBL has proven effective, its implementation still requires adequate support from various parties.

Overall, this discussion shows that the Project-Based Learning model has advantages in improving students' critical thinking skills, but its effectiveness is strongly influenced by internal and external learning factors. Compared with previous research, this study provides a new contribution by integrating cognitive aspects, the learning process, and the context of Islamic values within a single, coherent analytical framework. Therefore, developing an

adaptive and contextual PjBL-based Islamic Education learning model is crucial for improving the quality of learning while simultaneously shaping students' critical and noble character.

This study has several limitations that need to be considered when interpreting the findings. First, the study design used a quasi-experimental approach with purposive sampling in one school, so the results cannot be broadly generalized to all educational contexts with varying characteristics. Second, the duration of the Project-Based Learning (PjBL) model was relatively limited, so the measured improvement in students' critical thinking skills reflects more of a short-term impact, rather than a long-term one. Third, the instruments used focused on measuring the cognitive aspects of critical thinking, while the affective dimensions and internalization of Islamic values had not been measured in depth with more specific and comprehensive instruments. Furthermore, external factors such as differences in students' initial abilities, learning motivation, and teachers' skills in managing project-based learning also have the potential to influence the research results, but have not been fully controlled for optimally.

The novelty of this study lies in its integrative approach, which examines the effectiveness of the Project-Based Learning (PjBL) model in Islamic Religious Education (PAI) learning not only in terms of improving cognitive critical thinking skills, but also from the perspective of a contextual learning process based on Islamic values. Unlike previous studies that tended to be partial either only testing the influence of PjBL quantitatively, focusing on general subjects, or not yet linking it to the value dimension this study presents a more comprehensive analysis by integrating cognitive aspects, learning activities, and strengthening religious character within a single project-based learning framework. Furthermore, this study also offers an adaptive PjBL implementation model in the context of PAI, which can serve as a practical reference for teachers in developing innovative, critical, and meaningful learning in the 21st-century education era.

CONCLUSION

The results of the study indicate that the application of the Project-Based Learning (PjBL) model in Islamic Religious Education (PAI) learning has proven effective in improving students' critical thinking skills, as indicated by a significant increase in post-test scores compared to pre-test scores, a high N-Gain category in the experimental class, and increased student activity in analyzing problems, presenting arguments, and developing project-based solutions; in addition, the learning process also becomes more meaningful because students are directly involved in contextual activities that link PAI material to real life. Based on these findings, it can be concluded that the PjBL model is not only able to improve students' cognitive abilities, but also encourages active involvement, collaboration, and learning independence, which are important parts of critical thinking skills. Therefore, it is recommended that PAI teachers implement the PjBL model sustainably with careful planning, schools provide support in the form of training and provision of adequate learning resources, and further researchers develop broader studies with longer research durations and integrate

affective aspects and Islamic values in more depth, so that PAI learning can be more effective in forming students who are critical, creative, and have noble character.

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