

Research Article

Cite this article: 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, e2025412.
<https://doi.org/10.22521/edupij.2025.18.412>

Received May 21, 2025

Accepted August 10, 2025

Keywords: Problem-based learning, pedagogical innovation, higher education, Islamic education, students' comprehension

Author for correspondence:

Amirudin Amirudin

✉ amirudin@staff.unsika.ac.id

✉ Universitas Singaperbangsa Karawang,
Karawang, Indonesia

Problem-Based Learning as a Pedagogical Innovation for Transforming Higher Education Students' Islamic Religious Comprehension

Amirudin Amirudin , Iqbal Amar Muzaki , Sri Nurhayati 

Abstract

Background/purpose. Islamic Religious Education (IRE) in higher education serves as a foundation for shaping students' spiritual insight, moral reasoning, and critical reflection. However, conventional instructional approaches often lack contextual relevance and fail to engage learners deeply. This study explores the transformative potential of Problem-Based Learning (PBL) as a pedagogical innovation to enhance students' comprehension and application of Islamic religious concepts.

Materials/methods. A Sequential Explanatory Mixed Methods design was employed, involving 143 undergraduate students from a public Islamic university in Indonesia. The study began with a pre- and post-test to assess changes in students' comprehension of core IRE concepts, followed by semi-structured interviews to explore student perceptions. Quantitative data were analyzed using descriptive statistics and paired t-tests, while qualitative data underwent thematic analysis.

Results. Quantitative findings revealed a statistically significant improvement in post-test scores, indicating PBL's effectiveness in enhancing conceptual understanding. Qualitative insights identified four major themes: increased conceptual clarity, improved critical thinking, enhanced classroom engagement, and challenges related to time constraints and facilitator support. These results underscore PBL's capacity to foster reflective and meaningful religious learning experiences.

Conclusion. Problem-Based Learning significantly enhances students' comprehension and engagement in Islamic Religious Education by fostering critical thinking, contextual understanding, and reflective learning. While previous studies have explored PBL in religious contexts, this research deepens the evidence by integrating quantitative improvements with rich qualitative insights from higher education learners. It highlights the pedagogical potential of PBL in bridging doctrinal understanding with real-life application. The study recommends curriculum-level integration, educator training, and time-structured implementation to optimize its use in Islamic educational settings.



OPEN ACCESS

© The Author(s), 2025. This is an Open Access article, distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution, and reproduction, provided the original article is properly cited.

1. Introduction

Islamic Religious Education (IRE) at the higher education level is increasingly recognized as a crucial vehicle for shaping morally grounded, spiritually reflective, and intellectually capable students. In the context of Indonesia and other Muslim-majority societies, this educational field is tasked not only with transmitting classical religious knowledge but also with preparing learners to navigate the complexities of contemporary life while upholding Islamic values (Baharuddin et al., 2024). However, current pedagogical practices often fall short of this transformative mission. Traditional lecture-based methods continue to dominate, favoring one-way knowledge transmission and rote memorization over reflective engagement and critical inquiry (Ayyad, 2022; Bensaid & Machouche, 2017; Omar, 2022; Widyawati & Nurhayati, 2023). This approach, while historically and culturally significant, has demonstrated limited success in cultivating students' ability to internalize values or apply Islamic teachings to modern ethical dilemmas (Ayyad, 2022; Felsenthal & Agbaria, 2025).

Recent literature highlights that Islamic Religious Education faces multi-layered challenges. These include curricular fragmentation, lack of contextual relevance, and pedagogical stagnation in addressing students' cognitive and affective needs (Abdul Khalil et al., 2024; Ulfat, 2020). In regions such as Aceh, the challenge is further intensified by the need to balance national educational standards with local religio-cultural traditions (Razali et al., 2024). Meanwhile, inconsistent integration of national values and religious moderation across universities results in uneven graduate competencies (Faisal et al., 2021; Yani et al., 2023). Teaching methods also remain largely traditional and insufficiently responsive to digital transformation and global educational trends (Amaly et al., 2023; Hashim, 2017; Ismail et al., 2024; Nurhayati et al., 2024). Together, these factors underscore the urgent need for pedagogical reform in Islamic higher education.

The core problem addressed by this study is the limited effectiveness of conventional instructional strategies in fostering deep comprehension, value internalization, and critical thinking in Islamic Religious Education. Although lecture-based approaches have succeeded in delivering factual knowledge, they often disengage students and hinder the development of higher-order cognitive and ethical reasoning skills (Felsenthal & Agbaria, 2023; Omar, 2022). These shortcomings become particularly evident when students struggle to relate abstract religious doctrines to everyday ethical challenges. Additionally, the reliance on memorization—while culturally rooted—tends to reduce learning to passive recall, marginalizing the reflective and dialogical dimensions of faith-based education (Ayyad, 2022). In response to these limitations, a range of innovative teaching strategies has been proposed. Contextual Teaching and Learning (CTL), for example, links religious content with real-life scenarios to enhance relevance and comprehension (Parhan et al., 2024). Similarly, the Bahtsul Masa'il method engages students in interpreting classical texts through collaborative discourse, enhancing both reading comprehension and applied ethical reasoning (Hudri & Al Haj Zaini, 2023). These approaches indicate a growing recognition that effective Islamic education must move beyond knowledge transmission toward reflective and contextualized learning. Among the emerging strategies, Problem-Based Learning (PBL) stands out for its strong theoretical foundations and demonstrated impact on learning outcomes. Grounded in constructivist and transformative learning theories, PBL emphasizes student-driven inquiry, critical thinking, and real-world problem solving (García-Planas et al., 2021; Hung & Amida, 2020). In moral and values education, PBL fosters ethical reasoning by encouraging learners to engage with complex issues, formulate judgments, and collaboratively seek solutions (Bessa et al., 2017). Furthermore, it aligns well with Islamic pedagogical goals, promoting not only intellectual development but also character formation and social responsibility (Khatiban et al., 2019; Khazen, 2024).

Empirical studies have shown that PBL can enhance religious comprehension and moral development more effectively than traditional methods (Khatiban et al., 2019; Mao, 2021). In comparative research, PBL has been found to outperform lecture-based instruction in fostering

analytical skills, ethical sensitivity, and decision-making capabilities among students. Its collaborative nature also supports the development of communication and teamwork skills, which are essential for holistic education (Harasym et al., 2013). In the context of Islamic education, PBL's potential is increasingly recognized, though its implementation remains sporadic and under-studied. A growing body of literature has begun to explore PBL's integration within Islamic education, particularly in Southeast Asia. However, these studies often focus on specific institutional contexts, such as pesantrens or madrasas, limiting the generalizability of findings (Anshori, 2021; Rohman, 2022). Challenges to implementation include entrenched traditionalism, insufficient teacher training, and logistical constraints such as limited classroom time and technological resources (de Araújo et al., 2018; Elena-Mirela et al., 2015; Papakostas, 2024). Moreover, there is a paucity of research that systematically aligns PBL with Islamic epistemologies or explores its impact on students' reflective and spiritual development (Achmad & Fitria, 2024).

This study responds to these gaps by examining the implementation of Problem-Based Learning in an Islamic Religious Education program at the higher education level in Indonesia. Specifically, it investigates whether PBL can significantly improve students' understanding of core Islamic concepts and enhance their engagement with religious values in daily life. Based on the gaps in literature and contextual challenges identified, this study addresses the following research questions:

1. To what extent does the implementation of Problem-Based Learning improve higher education students' comprehension of Islamic Religious Education concepts?
2. What are students' perceptions of the cognitive impact and instructional challenges of Problem-Based Learning in Islamic Religious Education?

2. Literature Review

2.1. Theoretical Foundation of Problem-Based Learning (PBL) *Problem-Based Learning*

Problem-Based Learning (PBL) signifies a fundamental transformation in pedagogical paradigms, representing a shift from transmission-oriented, instructor-led modalities to learner-centered approaches grounded in authentic engagement and contextual relevance. Rooted in a sophisticated amalgam of learning theories, PBL promotes inquiry-driven, collaborative, and reflective learning processes that align with the epistemological demands of 21st-century education (Akçay, 2009; Storey & Schiavo, 2013). At its core, PBL is informed by constructivist theory, which posits that learners actively construct knowledge through meaningful engagement with their environment. This constructivist orientation redefines the learner's role from passive recipient to active knowledge builder, wherein students interrogate complex, ill-structured problems and synthesize multi-sourced information to derive actionable solutions. Such cognitively demanding engagement fosters deeper conceptual understanding and enhances the transferability and sustainability of learning (Zhao et al., 2024).

Complementing this is social constructivism, which accentuates the intersubjective nature of learning through collaborative dialogue. Within PBL frameworks, learners co-construct knowledge in small group settings by articulating hypotheses, evaluating perspectives, and negotiating shared meanings. These socially mediated interactions enhance not only individual cognitive development but also cultivate interpersonal competencies critical for professional practice, including communication, empathy, and cooperative problem-solving (Safitri & Nurhayati, 2023; Shimizu et al., 2021; Wu et al., 2018). The theoretical scaffolding of PBL is further enriched by insights from cognitive psychology. This perspective underscores how learners organize, store, and retrieve information, emphasizing mental processes such as abstraction, reasoning, and reflection. PBL facilitates the activation of prior knowledge, promotes hypothesis testing, and encourages iterative refinement of

understanding—processes that are crucial for the development of flexible, adaptable cognitive schemas (Lu et al., 2014).

In higher education, the relevance of PBL is amplified by Adult Learning Theory, particularly Knowles' andragogical framework. This theory contends that adult learners are autonomous, goal-oriented, and motivated by the perceived applicability of knowledge (Musa & Nurhayati, 2021; Nurhayati, 2024). PBL aligns with these characteristics by situating learning within real-world contexts that resonate with learners' experiences and professional aspirations, thereby fostering agency and engagement (Ratnawulan et al., 2025; Tiarawati et al., 2023). Additionally, Transformative Learning Theory offers a critical dimension to PBL, especially in disciplines where ethical reasoning and identity formation are paramount. This theory emphasizes the role of critical reflection in effecting paradigm shifts in learners' worldviews. Through engagement with morally and intellectually challenging scenarios, students are prompted to re-evaluate entrenched assumptions and reconstruct their frames of reference, thereby achieving transformative learning outcomes (Harahap, 2023; Wang & Cranton, 2016).

2.2. PBL in Higher Education

Problem-Based Learning (PBL) has emerged as a transformative pedagogy within higher education, originating in medical training and progressively adopted across disciplines such as engineering, architecture, science, and business. At its core, PBL fosters a student-centered learning environment where learners engage collaboratively in solving real-world, ill-structured problems. This approach promotes the development of essential academic and professional competencies, including critical thinking, self-directed learning, and collaborative problem-solving (Hung & Amida, 2020). Underpinned by constructivist principles, PBL encourages deep cognitive engagement by positioning students as active agents in constructing knowledge. By applying learned concepts to authentic scenarios, students not only retain information more effectively but also cultivate adaptability and analytical skills. Furthermore, PBL nurtures soft skills—such as teamwork, professional communication, and leadership—that are increasingly critical in contemporary work environments (Muhd Darus et al., 2016).

Empirical studies confirm that students engaged in PBL demonstrate higher academic achievement, improved conceptual understanding, and stronger motivation, particularly when instruction is aligned with real-life relevance and professional contexts (Adamuthe & Mane, 2020; Nemakhavhani, 2024). Nevertheless, successful implementation is not without obstacles. Key challenges include resource limitations, faculty preparedness, time constraints, and curricular rigidity, all of which may hinder PBL's institutional integration (Borges et al., 2014; Salvador et al., 2023). Best practices underscore the importance of sustained institutional support, innovative assessment strategies, and interdisciplinary collaboration in course design. Moreover, the effectiveness of PBL is closely tied to its alignment with cultural and contextual realities. In non-Western academic settings, adapting PBL to local discourse norms and learning expectations is critical for fostering engagement and inclusivity (Imafuku, 2012; Savin-Baden, 2016). PBL represents a powerful instructional model capable of preparing students for the intellectual and interpersonal demands of the 21st-century workforce.

2.3. PBL in Islamic Education

Problem-Based Learning (PBL) has emerged as a transformative instructional method in Islamic education, facilitating the integration of contemporary pedagogical practices with traditional religious instruction. It engages students in authentic, real-world problems that require critical thinking, reflective reasoning, and the application of Islamic ethical frameworks. This alignment with Islamic epistemology reinforces PBL's relevance in nurturing deep comprehension and principled decision-making. In disciplines such as fiqh, PBL has proven effective in fostering higher-order

thinking by challenging students to integrate doctrinal knowledge with ethical analysis. This capacity to provoke rigorous reflection and analytical rigor marks a departure from rote memorization, positioning PBL as a means to cultivate deeper engagement with Islamic legal reasoning (Haryani et al., 2019). Similarly, embedding Islamic values into PBL processes—such as in madrasa sociology classes—has demonstrated improved student motivation and cognitive, affective, and psychomotor outcomes (Anshori, 2021). Digital innovations further enhance PBL's impact. Mobile applications rooted in structured instructional design models, such as ADDIE, have increased accessibility to interactive and autonomous learning environments in Islamic education (Nawi & Zakaria, 2019). At the same time, the *bahth al-masa'il* tradition in Indonesian pesantrens reflects a culturally embedded form of PBL, emphasizing student agency and collaborative textual interpretation (Rohman, 2022).

However, effective implementation is not without its challenges. The success of PBL hinges on well-crafted, contextually relevant problem scenarios and the capacity of educators and learners to navigate technological tools (Alajab & Jafer, 2015; Gregori-Giralt & Menéndez-Varela, 2015). These limitations necessitate targeted training, institutional support, and pedagogical alignment. Despite such barriers, PBL remains pedagogically robust, fostering skills in inquiry, communication, and ethical application of knowledge. It not only transforms passive learning into an active, student-centered process but also reinforces lifelong learning competencies—skills essential for intellectual and moral development in Islamic education (Asad et al., 2015). PBL's integration within Islamic education supports a holistic learning paradigm that merges cognitive excellence with spiritual purpose. Its capacity to foster interpretive depth, reflective ethics, and autonomous learning positions it as a powerful tool for shaping morally responsible and critically engaged Muslim learners.

2.4. PBL Efficacy in Improving Students' Comprehension

Problem-Based Learning (PBL) has emerged as a transformative pedagogical model that significantly enhances students' comprehension and learning outcomes across educational levels and disciplines. At its core, PBL cultivates critical thinking, facilitates deep conceptual understanding, and promotes long-term knowledge retention by engaging students in inquiry-driven, real-world problem-solving. Empirical findings consistently demonstrate that PBL elevates students' higher-order cognitive skills, particularly among learners with strong academic orientation and consistent participation (Lee, 2025). The incorporation of concept mapping into PBL frameworks further amplifies engagement and reinforces learning gains across cognitive and behavioral dimensions (Mesbah et al., 2025). These outcomes are echoed in subject-specific applications; for instance, PBL has been shown to improve achievement and scientific attitudes in physics education (Isna & Masykuri, 2018). Similarly, integrating gamification tools such as Kahoot! within PBL contexts has been found to heighten academic performance and learner satisfaction (Taesotikul et al., 2021).

From a cognitive standpoint, PBL fosters durable knowledge retention and facilitates transfer of learning to unfamiliar contexts, largely due to its emphasis on active, self-directed learning (Yew & Goh, 2016). It also promotes intrinsic motivation and sustained engagement, evidenced by improved attendance patterns and positive student feedback (De Witte & Rogge, 2016; Naik et al., 2024). The use of authentic, real-life problems and cooperative learning structures sustains learner interest and contributes to deeper, more meaningful educational experiences (Badjie & Velankar, 2023). Beyond cognitive outcomes, PBL supports the development of essential twenty-first-century skills—including collaboration, communication, leadership, and adaptability—that are vital for success in contemporary professional environments (Naik et al., 2024). It enhances students' sense of agency and academic self-efficacy, empowering them to take ownership of their learning processes. A broader theoretical lens reveals that PBL not only supports immediate comprehension but also enhances knowledge transfer, reasoning, and cognitive flexibility. Students engaged in PBL frequently demonstrate stronger self-regulatory learning strategies and are more adept at applying their knowledge to complex, novel problems (Lu et al., 2014). These effects are magnified in settings where

PBL is supported by structured reflection and collaborative inquiry (Borges et al., 2014; Hung & Amida, 2020). Longitudinal findings suggest that even short-term exposure to PBL can yield measurable improvements in general problem-solving capacity and critical thinking (Knöpfel et al., 2024). PBL not only supports comprehension as an outcome but also acts as a driver of motivation and academic quality. When coupled with strategies that enhance learner motivation, PBL contributes to a more inclusive, engaging, and dynamic classroom environment (Tongpaeng & Thongsibsong, 2013). PBL stands as a powerful instructional approach with demonstrated efficacy in improving students' comprehension, critical reasoning, and academic engagement. Its strengths are rooted in learner-centered design, contextual relevance, and its capacity to integrate cognitive, metacognitive, and affective dimensions of learning. Realizing its full potential, however, depends on strategic implementation that aligns with learners' contexts and provides adequate support for both instructors and students (Das et al., 2023).

3. Methodology

3.1. Study design

This study employed a Sequential Explanatory Mixed Methods approach, integrating quantitative and qualitative data collection and analysis in two strategically ordered phases (Creswell & Creswell, 2017). The quantitative strand followed a quasi-experimental design using a single-group pre-test and post-test procedure without a control group, which is acknowledged as a limitation of the study. The qualitative strand adopted a basic interpretive qualitative design to explore students' learning perceptions and experiences. Data integration followed a sequential explanatory strategy, in which qualitative findings were used to interpret and enrich the quantitative results. The initial quantitative phase served to establish empirical evidence concerning the pedagogical effectiveness of Problem-Based Learning (PBL) in enhancing students' comprehension of Islamic Religious Education (IRE) content. The subsequent qualitative phase was designed to elucidate and contextualize these results through the in-depth exploration of student perspectives. This design was selected to afford both analytical breadth and explanatory depth. While the quantitative component provided statistically measurable insights, the qualitative dimension enabled a richer interpretation of how students cognitively and affectively engaged with PBL as a pedagogical strategy. The use of methodical triangulation across phases contributed to the robustness of internal validity and strengthened the interpretative credibility of the study.

3.2. Participants

The target population consisted of fourth-semester undergraduate students enrolled in the Islamic Education Study Program at Singaperbangsa University, Karawang, which was chosen due to its ongoing curricular reform efforts integrating Islamic values with student-centered learning models, making it a suitable site to examine the transformative impact of Problem-Based Learning. The total population comprised 222 students, all of whom had completed the Philosophy of Islamic Education course—a foundational requirement for participation. A simple random sampling technique was employed to minimize selection bias and ensure representativeness. Utilizing the Slovin formula at a 5% margin of error, a sample of 143 students was obtained. This sampling strategy facilitated generalizability within the defined population while ensuring analytical rigor. Eligibility criteria included course completion and lack of prior exposure to PBL-based instruction, thereby mitigating confounding influences on outcome measures.

3.3. Data collection tools

Data collection was aligned with the mixed-methods framework, comprising both standardized cognitive assessments and semi-structured qualitative interviews.

The quantitative instrument consisted of a 40-item multiple-choice test aimed at evaluating students' understanding of essential IRE domains—namely, worship (ibadah), creed (aqidah), ethics (akhlaq), and social interaction (muamalah). Items were meticulously crafted to align with the six cognitive domains of Bloom's Revised Taxonomy: remembering, understanding, applying, analyzing, evaluating, and creating. The test was administered in a pre-test/post-test configuration, framing the PBL intervention that occurred across two structured learning sessions. The intervention was carried out in five key steps: (1) identification of real-life religious problems related to IRE domains, (2) small group discussions and formulation of hypotheses, (3) independent and collaborative search for solutions using Islamic sources, (4) classroom presentations and peer dialogue, and (5) individual reflection with facilitator feedback.

For the qualitative strand, semi-structured interviews were conducted with a purposive sub-sample drawn from the main study cohort. The interview guide was constructed with reference to the study's conceptual framework and extant literature on constructivist pedagogy in Islamic education. The interviews explored students' perceptions of the instructional process, motivational responses, cognitive engagement, and their perceived ability to apply IRE concepts beyond the classroom. All interviews were recorded, transcribed verbatim, and conducted in settings that ensured participant confidentiality and comfort.

3.4. Validity of data collection tools

To ensure both construct and content validity, the cognitive assessment underwent rigorous scrutiny by two academic experts specializing in Islamic Religious Education and instructional evaluation. Each item was systematically reviewed for theoretical alignment, semantic clarity, and pedagogical relevance to the targeted learning outcomes. Recommendations from the validation process were meticulously integrated to refine the instrument prior to its deployment. Reliability was established through the computation of Cronbach's Alpha, which produced a coefficient of 0.85, indicating high internal consistency across test items. To mitigate confounding variables and ensure procedural uniformity, the cognitive assessments were administered under standardized conditions. Synchronization of the intervention and post-assessment schedule further enhanced the internal validity of the findings.

Regarding qualitative data, the study upheld methodological rigor through the implementation of triangulation, peer debriefing, and participant member checking. To bolster trustworthiness, selected interview transcripts were returned to participants for verification, ensuring accurate representation of their perspectives. A comprehensive audit trail was maintained throughout the analysis phase, which included the use of codebooks, documented theme development processes, and reflexive analytic memos to enhance transparency and reproducibility of qualitative inferences.

3.5. Data analysis procedure

Quantitative data were analyzed using IBM SPSS Statistics, applying both descriptive and inferential statistical techniques. Descriptive statistics, including means, standard deviations, and frequency distributions, provided a foundational overview of student performance. A paired samples t-test was subsequently employed to assess statistically significant differences between pre- and post-intervention scores, thereby quantifying the effectiveness of the PBL intervention on students' comprehension of Islamic Religious Education content.

Qualitative data underwent thematic analysis, rigorously following Braun and Clarke's (2006) six-phase framework: data familiarization, initial code generation, theme development, thematic review, theme definition, and synthesis of findings. Coding was executed manually and cross-verified through peer debriefing to bolster analytical reliability. The process emphasized thematic saturation, ensuring that core patterns were robustly captured and interpretively sound. To enhance analytical depth,

emergent qualitative themes were cross-examined with quantitative findings through a process of methodological triangulation, enabling an integrated, multi-dimensional interpretation of the pedagogical impacts under investigation

3.6. Ethical considerations

All research procedures conformed to institutional ethical standards and protocols. Ethical clearance was obtained from the university's ethics committee prior to data collection. Informed consent was secured from all participants, who were briefed on the study's aims, methodologies, confidentiality safeguards, and their rights—including the right to withdraw without consequence. Anonymity was preserved through the de-identification of data, and all digital files were securely stored in password-protected environments. These ethical protocols, combined with methodological integrity, ensured that the research was conducted responsibly, with due consideration for participant welfare and academic standards. The research methodology employed in this study exemplifies a rigorous and ethically grounded approach to investigating pedagogical innovation within Islamic Religious Education.

4. Results

4.1. Problem-Based Learning Implementation and Higher Education Students' Comprehension Of Islamic Religious Education Concepts Improvement

Quantitative data were collected using a multiple-choice test comprising 40 items covering key domains of Islamic Religious Education—worship (ibadah), creed (aqidah), ethics (akhlaq), and social interaction (muamalah). The test was administered to 143 students before (pre-test) and after (post-test) the PBL intervention. As illustrated in Table 1, the pre-test scores averaged 36.42 (SD = 2.812), while the post-test scores increased to an average of 38.24 (SD = 2.648). The improvement of nearly two points suggests a moderate yet meaningful gain in students' comprehension. The minimum score rose from 29 to 31, and the maximum increased from 39 to a perfect score of 40. These trends reflect a reduction in performance variance and a shift towards higher overall achievement.

Table 1. Descriptive Statistics of Pre-Test and Post-Test Scores

Statistics	Pre-Test	Post-Test
N (Number of data)	143	143
Mean	36.42	38.24
Std. Deviation	2.812	2.648
Minimum	29	31
Maximum	39	40

To determine whether the observed difference in comprehension was statistically significant, a paired samples t-test was performed. The results yielded a p-value of <0.001 ($p < 0.05$), confirming that the increase in post-test scores was not due to chance. The average gain of 1.818 points is statistically significant, underscoring the efficacy of the PBL model in fostering deeper conceptual understanding among students. The score progression is visually represented in Figure 1. The graph delineates a clear improvement from pre-test to post-test phases, providing further validation of the quantitative findings. The trajectory evidences both the effectiveness and consistency of PBL's impact on students' learning outcomes.

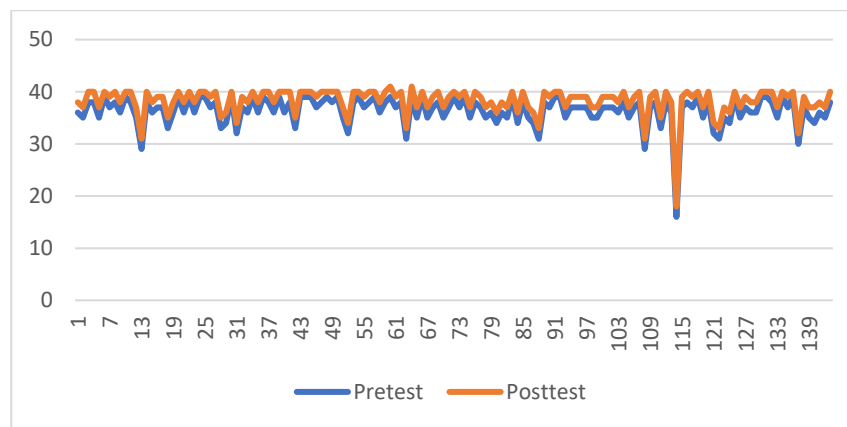


Figure 1. Comparison of Pre-Test and Post-Test Mean Scores

4.2. Students' Perceptions of The Cognitive Impact And Instructional Challenges Of Problem-Based Learning In Islamic Religious Education

Students' perceptions of the PBL experience were explored through thematic analysis of qualitative interview data. The themes and patterns that emerged provide insight into both the perceived cognitive benefits and instructional barriers associated with PBL. The most frequently referenced themes are presented in Table 2, alongside illustrative quotes and the number of respondents who contributed to each category.

Table 2. Qualitative Themes and Representative Quotes on Students' Perceptions of PBL

Theme	Description	Representative Quote	Frequency (n=20)
Improved Understanding of IRE	A deeper grasp of Islamic concepts and their real-life application	"PBL helps me relate IRE concepts to problems in the community... it can also be applied in everyday life." – Student C	18
Enhanced Critical Thinking	Improved analytical reasoning and ethical decision-making	"PBL taught me to find solutions that are in accordance with Islamic values, such as justice, honesty, and brotherhood." – Student H	16
Increased Engagement and Motivation	Greater interest and active participation in learning processes	"I became more enthusiastic about learning IRE... I can't wait for IRE class." – Student I	15
Time Constraints	Insufficient class time for in-depth discussion and task completion	"We need more time for discussion, finding information, and preparing reports." – Student M	14
Instructor Support Needed	Demand for clearer instruction and more frequent feedback from lecturers	"Sometimes I am still confused. I need more intensive guidance from the lecturer." – Student O	12

1. Improved Understanding of IRE Concepts

Students reported enhanced conceptual understanding, particularly in grasping the spiritual significance of worship. For instance, Student A articulated a deeper devotion in prayer, while Student B reflected on the ethical dimensions of fasting. Furthermore, participants indicated an improved ability to apply religious knowledge to societal issues, as evidenced by Students C and D who linked IRE concepts to business ethics and community problem-solving. These perspectives affirm PBL's role in making abstract religious concepts more personally relevant and actionable.

2. Enhanced Critical Thinking Skills

The qualitative data revealed that PBL fostered analytical reasoning and value-based decision-making. Students such as E and F described learning to identify root causes of problems and critically assess relevant information. Others, like G and H, emphasized their capacity to formulate ethically grounded solutions, guided by Islamic principles like justice and integrity. The narratives suggest that PBL environments challenge students to engage in deeper reasoning that transcends rote memorization.

3. Increased Engagement and Motivation

Participants expressed heightened interest and participation in IRE classes. Students I and J remarked on increased motivation and reduced boredom, while K and L highlighted elevated classroom interactivity and confidence in articulating their views. The experiential, student-centered nature of PBL appeared to cultivate intrinsic motivation, thereby enhancing overall learning engagement.

4. Implementation Challenges

Despite the benefits, students also reported barriers to effective PBL implementation. The most cited challenges were time constraints and the need for more lecturer support. Students M and N noted insufficient in-class time for discussion and problem resolution, while Students O and P emphasized the necessity of more structured feedback and guidance. These insights underscore the importance of institutional preparedness in facilitating effective PBL delivery.

The integration of both quantitative results and qualitative feedback presents a holistic view of PBL's impact. The statistically significant improvement in test scores is corroborated by students' reflective testimonies, which reveal deeper cognitive engagement, enhanced motivation, and greater applicability of Islamic values in everyday contexts. For example, the rise in average test scores aligns with students' expressed gains in comprehension and critical thinking. Meanwhile, the increased range and specificity of qualitative responses underscore the multidimensional nature of learning transformation. Moreover, the qualitative accounts offer critical insights into how PBL fosters metacognitive growth, prompting students to question assumptions, justify interpretations, and derive value-based solutions to real-world issues. This development, while difficult to capture in test scores alone, marks a significant educational achievement. Simultaneously, recurring themes of time limitations and instructor feedback gaps highlight structural issues that must be addressed to optimize PBL's impact. Collectively, the results indicate that PBL substantially enhances both the cognitive and affective dimensions of students' engagement with Islamic Religious Education. The challenges identified point to the importance of structural and instructional support to optimize PBL's implementation. With appropriate scaffolding, PBL has the potential to become a cornerstone of pedagogical innovation in religious higher education.

5. Discussion

5.1. Problem-Based Learning Implementation and Higher Education Students' Comprehension Of Islamic Religious Education Concepts Improvement

This study provides robust empirical evidence affirming the efficacy of Problem-Based Learning (PBL) in fostering higher education students' comprehension of Islamic Religious Education (IRE) concepts. The statistically significant improvement in post-test scores ($M = 38.24$) compared to pre-test scores ($M = 36.42$), with a paired samples t-test indicating $p < 0.001$, substantiates the cognitive benefits of the PBL intervention. This improvement was observed across core domains of IRE, including worship (ibadah), creed (aqidah), ethics (akhlaq), and social interaction (muamalah), highlighting the model's effectiveness in facilitating integrative and holistic understanding.

The enhancement in students' conceptual mastery echoes findings from Nawawi and Zakaria (2019), who demonstrated the superiority of online PBL in deepening religious value internalization when contrasted with conventional pedagogies. Likewise, Khazen (2024) found that PBL significantly enriched ethical reasoning and decision-making skills among female tertiary learners, underscoring its relevance in values-oriented educational settings. The present research reinforces these outcomes in a traditional classroom environment, indicating PBL's versatility and pedagogical adaptability. The reduced standard deviation from 2.812 to 2.648 suggests not only an upward shift in achievement but also a compression in performance disparities, indicating a more equitable learning effect. Nugraha et al. (2024) documented similar outcomes when PBL was combined with flipped learning to address Sustainable Development Goals (SDGs), supporting the contention that PBL facilitates inclusive education for heterogeneous learners.

From a theoretical perspective, the results affirm the paradigm shift from rote memorization to inquiry-based learning within religious studies. This aligns with Plummer et al. (2020) and Arifin et al. (2025), who emphasized that such a shift promotes higher-order thinking, reflective reasoning, and authentic engagement with religious content. The observed gain in scores reflects this epistemic transformation, confirming that PBL enables students to move beyond surface-level learning toward deeper spiritual and ethical inquiry. Parallel findings in secular disciplines provide further validation. Bazrafcan et al. (2018) showed improved motivation and ethical reasoning in medical students exposed to PBL, while Madhavi et al. (2024) highlighted its dual impact on technical and ethical competencies among engineering students. These interdisciplinary outcomes reinforce the argument that PBL cultivates multifaceted learners capable of ethical judgment, critical reflection, and applied knowledge transfer.

Knoblauch and Tamer-Uzun (2023) underscored that culturally responsive, collaborative PBL models develop students' intercultural competencies and religious tolerance—essential attributes in pluralistic societies. Santos Meneses (2020) similarly advocated for dialogical learning in religious education, showing that ethical discourse cultivates both civic responsibility and spiritual insight. These findings support the inclusion of reflective dialogue in IRE through PBL to nurture comprehensive ethical development. Suyitno et al. (2025) further observed that PBL fosters internalized moral reasoning by engaging students in critical reflection on religious texts and values. Budiayanti et al. (2024) advanced this integration through the *ulû al-'ilm* model, combining Quranic epistemology with PBL and demonstrating holistic student development across cognitive, ethical, and spiritual dimensions.

Although the absolute mean score gain was relatively modest (1.818 points), this should be interpreted within the context of high baseline performance, potentially suggesting a ceiling effect. Araújo et al. (2018) noted similar limitations in PBL effectiveness when institutional constraints—such as rigid timelines and assessment formats—impeded the depth of inquiry-based tasks. Additionally, O'Brien et al. (2022) emphasized that structural hierarchies in religious institutions may inhibit open

dialogue and student agency, thus limiting PBL's transformative capacity. These observations highlight the need for institutional reform that supports learner autonomy, encourages dialogical exchange, and aligns assessment with exploratory learning outcomes. Effective implementation of PBL also hinges on teacher preparedness and institutional alignment. Sakir and Kim (2020) demonstrated that structured training and adaptive facilitation are critical to successful PBL integration. Fernandes-Osterhold (2022) similarly emphasized that pedagogical innovation must resonate with educators' epistemological orientations and the institutional value framework to achieve meaningful reform.

Chapman et al. (2014) and Muhamad et al. (2024) advocated for embedding real-world challenges within religious instruction to enhance engagement and relevance. These studies suggest that situating PBL within socio-ethical contexts, such as environmental stewardship or social justice, enables students to apply Islamic teachings to contemporary issues, thereby reinforcing both moral agency and societal responsibility. Current studies identified educator competence—both in pedagogy and spiritual guidance—as pivotal for navigating the dual imperatives of faith and inquiry (Adiyono et al., 2025; Mustari & Nurhayati, 2024; Nurhayati & Parhan, 2024). Their work underscores that PBL facilitators must be equipped not only with instructional strategies but also with a deep understanding of Islamic principles to guide ethically nuanced discourse. This study affirms that Problem-Based Learning is a highly effective pedagogical approach for advancing students' comprehension of Islamic Religious Education. Its capacity to foster critical thinking, ethical reasoning, and spiritual integration positions it as a powerful strategy for cultivating holistic learners. While structural and cultural challenges persist, the evidence underscores PBL's transformative potential when embedded within supportive, reflective, and value-conscious educational environments.

5.2. Students' Perceptions of The Cognitive Impact And Instructional Challenges Of Problem-Based Learning In Islamic Religious Education

A principal finding from the qualitative narratives is the elevation of students' cognitive engagement as a direct result of their immersion in the PBL framework. The most salient theme, Improved Understanding of IRE Concepts, encapsulates how abstract Islamic teachings were rendered more intelligible, relevant, and experientially grounded when contextualized within authentic, problem-based scenarios. Students articulated that this pedagogical shift enabled them to internalize doctrinal knowledge through its practical manifestations in ethical, social, and spiritual domains. This alignment of knowledge with lived experience marks a departure from conventional didacticism and affirms the potency of PBL in fostering deeper epistemological connections. The ability to bridge textual learning with real-world ethical dilemmas reflects a sophisticated engagement with religious education, wherein knowledge is not merely acquired but actively constructed and situated within a moral universe. These findings substantiate Budiyanti et al. (2024), who emphasize PBL's capacity to integrate cognitive rigor with spiritual formation, particularly in contexts where ethical reasoning and identity construction are foundational to the curriculum.

Closely aligned was the theme of Enhanced Critical Thinking. Students described moving beyond rote memorization to engage with complex, morally infused problems that required interpretation of Islamic values such as justice, compassion, and accountability. Their engagement in structured problem analysis and dialogical inquiry encouraged epistemic agency. These findings are consonant with Anshori (2021), who emphasized that value-laden inquiry can deepen students' reasoning capacities and reflective judgement in Islamic education. Furthermore, students' ability to substantiate arguments and navigate theological plurality reflects the metacognitive affordances of PBL.

Emotional engagement was also prominently observed. Under the theme Increased Engagement and Motivation, students expressed heightened enthusiasm, sense of ownership, and intrinsic motivation in IRE classes. The active, collaborative nature of PBL evidently nurtured a learning climate perceived as stimulating and empowering. These observations are reinforced by Asfihana et al. (2024) and Sholeh et al. (2024), who found that autonomy-supportive environments foster sustained student involvement. Grounded in Self-Determination Theory, this motivational resonance confirms that when students perceive relevance and autonomy, emotional engagement naturally follows. Moreover, this emotional involvement in IRE is intertwined with religiosity. Wahab et al. (2019) highlight that culturally relevant pedagogy enhances identity formation. Within this study, PBL appears to activate such latent motivators, allowing students to align learning experiences with their spiritual and moral frameworks.

Nonetheless, substantial instructional challenges were also documented. Students reported Time Constraints as a significant impediment, often leading to superficial discussion or incomplete collaboration. These perceptions echo prior findings by Abildinova et al. (2024) and Saavedra & Rapaport (2024) who identified structural time limitations as a critical barrier to PBL implementation. The temporal demand of research, synthesis, and presentation in PBL exceeds conventional classroom scheduling, necessitating institutional recalibration. The theme Need for Instructor Support further complicated the learning experience. While PBL assumes a shift toward learner autonomy, students noted that unstructured independence without adequate scaffolding resulted in cognitive overload and interpretive ambiguity. These findings align with Kokotsaki et al. (2016) and Obikwelu et al. (2012), who argue that high-functioning PBL necessitates active facilitation. In the context of IRE—where doctrinal precision and ethical clarity are essential—teacher mediation becomes even more vital. Chen et al. (2021) and Chikurteva & Chikurtev (2020) contend that pedagogical competence in PBL must be developed through sustained professional training, particularly when instructors are transitioning from traditional didactic roles.

Assessment also emerges as a systemic constraint. Without tailored rubrics that capture the processual and dialogic nature of PBL, both students and instructors face uncertainty in evaluating outcomes. Ali et al. (2021) and Žerovnik & Nančovska Šerbec (2021) call for comprehensive assessment models that recognize knowledge construction, ethical reasoning, and collaborative effort—dimensions central to IRE. Collectively, these findings suggest that while PBL offers a transformative pedagogical avenue, its implementation in Islamic education must be contextually attuned and institutionally supported. Effective enactment demands strategic planning, teacher preparedness, and curricular alignment with theological and pedagogical objectives. Teachers must serve as facilitators of inquiry while maintaining epistemic authority, and institutional stakeholders must ensure that temporal, technological, and training infrastructures are sufficiently robust.

Project-Based Learning constitutes a paradigm shift in educational design. Rather than functioning as a supplementary method, PBL reorients pedagogy toward student agency, problem orientation, and epistemic collaboration. Within IRE, this innovation harmonizes with constructivist principles while remaining sensitive to the spiritual and moral dimensions of learning. Scholars highlight PBL's potential to catalyze deep, interdisciplinary learning (Ardila-Duarte et al., 2019; Bendermacher et al., 2023). When adapted to faith-based curricula, PBL not only cultivates critical and creative thinking but also facilitates moral deliberation and spiritual growth (Acharya et al., 2021; Plaza-Angulo & López-Toro, 2025). Further studies by Chapman et al. (2014) and Safitri & Nurhayati (2023) suggest that integrating problem-based inquiry with spiritual values can reinforce students' identity formation and ethical agency. Fernandes-Osterhold (2022) similarly argue that teacher competence in value-based facilitation is essential for leveraging PBL's transformative potential. As such, PBL must not only be structurally integrated but philosophically aligned with the religious mission of educational institutions. The findings confirm that PBL significantly enhances students'

cognitive and emotional engagement in Islamic Religious Education. However, to realize its full potential, structural and pedagogical challenges—particularly those concerning time management, scaffolding, and assessment—must be proactively addressed. When implemented with thoughtful alignment to spiritual values and supported by institutional commitment, PBL can evolve into a cornerstone of innovative, transformative religious pedagogy.

6. Limitations and future research

Despite the significant contributions of this study, several limitations should be acknowledged that delimit the generalizability and scope of the findings. First, the participant sample was drawn exclusively from a single Islamic higher education institution, potentially narrowing the external validity across diverse educational ecosystems. The unique pedagogical practices, sociocultural norms, and institutional ethos specific to this setting may have shaped students' experiences of PBL in ways that are not universally replicable. Second, the study relied heavily on self-reported qualitative data, which, although rich and contextually grounded, introduces potential biases including social desirability, recall inaccuracies, and interpretive subjectivity. While the use of thematic analysis provides valuable insight into student perspectives, the absence of complementary quantitative measures limits causal inference and restricts our ability to quantify learning outcomes. Future research should consider longitudinal mixed-method designs, integrating psychometric assessments, learning analytics, and observational data to triangulate findings and enhance empirical robustness. Third, the role of instructional variables—such as teacher facilitation quality, PBL implementation fidelity, and curricular integration—was not systematically investigated. Further inquiry should examine how educator competence, professional development, and institutional alignment influence PBL outcomes in religious education contexts. Additionally, broader comparative studies are needed to explore PBL's pedagogical resonance across interfaith and intercultural educational settings. Fourth, although the study utilized a pre-test and post-test design to measure the impact of the intervention, it did not include a control group. The absence of a control group is a methodological limitation, as it restricts the ability to rule out alternative explanations for observed improvements and limits the strength of causal claims. Future research should consider employing a quasi-experimental design with a control group to provide more robust evidence of intervention effects. Finally, intervention-based research is recommended to evaluate the impact of PBL models specifically tailored to Islamic pedagogy. These efforts should include the design and testing of structured curricula that integrate Islamic ethical constructs with inquiry-based learning, supported by rigorous, culturally responsive evaluation frameworks. By addressing these methodological, instructional, and contextual gaps, future scholarship can offer a more nuanced and generalizable understanding of how PBL can be strategically implemented to enrich both the cognitive and spiritual dimensions of learning in religious education.

7. Suggestions and practical implications

The findings of this study present critical pedagogical and institutional implications that warrant immediate attention. First, the demonstrated cognitive and affective benefits of Project-Based Learning (PBL) suggest that it should be regarded not merely as an instructional supplement, but as a core pedagogical framework in Islamic Religious Education (IRE). Accordingly, educational institutions must initiate systemic reforms to embed PBL within the core of IRE curricula. This involves ensuring alignment with theological imperatives, fostering epistemological depth, and respecting the spiritual values that underpin religious instruction.

To support this integration, comprehensive and ongoing professional development is essential. Educators should be equipped not only with skills in inquiry-based and student-centered pedagogy but also with the theological literacy required to mediate between doctrinal content and problem-based processes. Targeted training programs, interdisciplinary mentoring, and reflective praxis

groups should be developed to build pedagogical agility among faculty. These efforts will enable educators to cultivate classroom ecologies that balance critical inquiry with reverence for sacred knowledge. Institutional infrastructures must also adapt to accommodate the unique demands of PBL. Academic scheduling should reflect the iterative nature of project development, and workloads should be recalibrated to allow deep inquiry and collaboration. Simultaneously, assessment systems must evolve. Traditional summative evaluations are insufficient for capturing the depth of learning fostered by PBL. Instead, multidimensional assessment tools—such as reflective portfolios, peer assessments, narrative evaluations, and rubric-based performance reviews—should be institutionalized. Culturally responsive project design is also imperative. PBL tasks should be anchored in locally meaningful issues that resonate with students' sociocultural contexts and religious values. Such contextualization enhances student motivation, fosters moral imagination, and nurtures the integration of faith and action. Furthermore, institutional leaders should promote collaboration with community stakeholders—including religious leaders, NGOs, and families—to bridge classroom learning with communal transformation. Through these comprehensive strategies, Islamic higher education institutions can actualize a pedagogical model that is both deeply rooted in Islamic epistemology and dynamically responsive to the challenges of contemporary education. By embracing PBL as a central modality, IRE can become a site of transformative learning where students are empowered not only as scholars of religion but as ethical agents and community leaders attuned to the complexities of the modern world.

8. Conclusion

This study addressed two main research questions regarding the impact of Problem-Based Learning (PBL) in Islamic Religious Education (IRE). First, the implementation of PBL led to a statistically significant improvement in students' comprehension of core IRE concepts, as indicated by the increase in post-test scores across domains such as ibadah, aqidah, akhlaq, and muamalah. Second, qualitative findings revealed that students perceived PBL as fostering deeper conceptual understanding, critical reasoning, and the ability to apply Islamic teachings to real-life situations. By facilitating the convergence of cognitive, affective, and ethical learning dimensions, PBL enables students to move beyond surface-level comprehension toward a more profound, integrative engagement with Islamic teachings. The model fosters critical reasoning, enhances moral discernment, and nurtures emotional resonance—core objectives of religious education. These outcomes demonstrate that PBL, when appropriately contextualized, offers a viable alternative to traditional didactic instruction, aligning with contemporary educational imperatives while preserving spiritual integrity. However, several challenges were identified in the PBL implementation process, including time constraints for group work and discussion, as well as the need for more intensive instructor support and feedback. These issues, compounded by the absence of a control group in this quasi-experimental study, should be acknowledged as methodological and practical limitations. Addressing these structural constraints requires institutional commitment to reimagining curriculum frameworks, assessment models, and faculty competencies. Moreover, embedding PBL within culturally responsive and community-integrated pedagogical ecosystems can further enhance its transformative potential. In light of these findings, this study recommends the strategic institutionalization of PBL in Islamic higher education, accompanied by sustained faculty development and structural support. Through this lens, Islamic education can cultivate ethically grounded, intellectually agile, and socially responsive learners equipped to navigate the complexities of the modern world.

Declarations

Author Contributions. All authors contributed to the original manuscript preparation. All authors have read and approved the final version of the article.

Conflicts of Interest. The authors declare no conflict of interest.

Funding. This research received no external funding.

Ethical Approval. Ethical approval and consent to participate were not required

Data Availability Statement. The data that support the findings of this study are available from the corresponding author upon reasonable request.

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>
- Abildinova, G., Abdykerimova, E., Assainova, A., Mukhtarkyzy, K., & Abykenova, D. (2024). Preparing educators for the digital age: teacher perceptions of active teaching methods and digital integration. *Frontiers in Education*, 9. <https://doi.org/10.3389/educ.2024.1473766>
- Acharya, S., Bhatt, A. N., Chakrabarti, A., Delhi, V. S. K., Diehl, J. C., van Andel, E., Jurelionis, A., Stasiulienė, L., De Jussilainen Costa, L., & Subra, R. (2021). Problem-Based Learning (PBL) in Undergraduate Education: Design Thinking to Redesign Courses. *Smart Innovation, Systems and Technologies*, 222, 349–360. https://doi.org/10.1007/978-981-16-0119-4_28
- Achmad, A., & Fitria, L. (2024). The Philosophical Trilogy for The Development of Islamic Educational Management. *TATHO: International Journal of Islamic Thought and Sciences*, 1(4), 227–237. <https://doi.org/10.70512/tatho.v1i4.49>
- Adamuthe, A. C., & Mane, S. U. (2020). PBL based teaching-learning strategy for inculcating research aptitude in cs/it students. *Journal of Engineering Education Transformations*, 33(Special Issue), 585–594. <https://doi.org/10.16920/jeet/2020/v33i0/150125>
- Adiyono, A., Nurhayati, S., Islam, M. S., Al-Badawi, H., Sain, Z. H., Wafi, H. A., & Vargheese, K. J. (2025). A Transdisciplinary Approach to Character Development: Islamic Teachings and Pancasila Values in Shaping Global and Faithful Students. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 7(1), 198–217.
- Akçay, B. (2009). Problem-based learning in science education. *Journal of Turkish Science Education*, 6(1), 26–36. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-67650232993&partnerID=40&md5=e0d8ea1fb0a5061e3c9dc7c436818ac9>
- Alajab, A. M., & Jafer, W. A. N. (2015). Using focus group techniques to explore the possibility of using electronic communication tools for problem based learning at arabian gulf university, kingdom of bahrain. *Arab Gulf Journal of Scientific Research*, 33(1), 11–35. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85034273842&partnerID=40&md5=e952198d2f53fa1fd541cacc537c6f18>
- Amaly, A. M., Herdiana, Y., Ruswandi, U., & Arifin, B. S. (2023). The Necessity And Reality Of Islamic Religious Education In Schools. *Jurnal Ilmiah Islam Futura*, 23(1), 1–19. <https://doi.org/10.22373/jiif.v23i1.13190>
- 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://www.scopus.com/inward/record.uri?eid=2-s2.0-85101568137&partnerID=40&md5=450f25255a7575b9aa9d64571ac437d7>
- Ardila-Duarte, C., Parody-Muñoz, A. E., Castro-Vásquez, L., Acuña-Sarmiento, J., Carmona-Martés, A.

- L., García-Flórez, E., Castro-Duran, J., & Hurtado-Carmona, D. (2019). Problem-based learning for the development of cross-sectional competences regarding health area programs at a higher education institution in barranquilla, colombia. *Revista Cubana de Educacion Medica Superior*, 33(1). <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85075609660&partnerID=40&md5=ee9d84a25043a679865add7713ad7911>
- Arifin, Z., Saputro, S., & Kamari, A. (2025). The effect of inquiry-based learning on students' critical thinking skills in science education: A systematic review and meta-analysis. *Eurasia Journal of Mathematics, Science and Technology Education*, 21(3). <https://doi.org/10.29333/ejmste/15988>
- Asad, M., Iqbal, K., & Sabir, M. (2015). Effectiveness Of Problem Based Learning As A Strategy To Foster Problem Solving And Critical Reasoning Skills Among Medical Students. *Journal of Ayub Medical College, Abbottabad : JAMC*, 27(3), 604–607. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84956578518&partnerID=40&md5=38859d6a44eb4d42808ab118dc13a96d>
- Asfihana, R., Rafiq, R., Iskandar, I., Rahayu, P. S., & Fuentes, A. S. (2024). THE IMPACT OF VIRTUAL VIDEO PROJECT ON STUDENTS' ENGLISH LEARNING ENGAGEMENT. *LLT Journal: Journal on Language and Language Teaching*, 27(2), 613–631. <https://doi.org/10.24071/llt.v27i2.6483>
- Ayyad, E. (2022). Re-Evaluating Early Memorization of the Qur'ān in Medieval Muslim Cultures. *Religions*, 13(2), 179. <https://doi.org/10.3390/rel13020179>
- Badjie, O., & Velankar, Y. (2023). Problem-based Learning: A Catalyst for Teacher and Student Motivation in K-12 Schools. *2023 IEEE International Conference on Teaching, Assessment and Learning for Engineering, TALE 2023 - Conference Proceedings*. <https://doi.org/10.1109/TALE56641.2023.10398301>
- Baharuddin, B., Nurhayati, S., Azzaoui, B., & Qolamani, K. I. B. (2024). Assessment of Al Qur'an Reading and Writing Program for Islamic Character Development in Higher Education. *IJECA (International Journal of Education and Curriculum Application)*, 7(1), 1–13.
- Bazrafcan, L., Takmil, F., & Shokrpour, N. (2018). Assessing the Effectiveness of Problem-Based Learning as a New Approach on Health Care Provider Ethical Reasoning Development in Shiraz University of Medical Sciences. *Health Care Manager*, 37(3), 273–277. <https://doi.org/10.1097/HCM.0000000000000223>
- Bendermacher, G., Egbrink, M. O., & Dolmans, D. (2023). How realist reviews might be helpful to further insights in problem-based learning. *Interdisciplinary Journal of Problem-Based Learning*, 17(2 Special issue). <https://doi.org/10.14434/ijpbl.v17i2.35636>
- Bensaid, B., & Machouche, S. ben T. (2017). Memorizing the Words of God: Special Reference to 'Abdul Rahman Ibn Khaldun (D. 1406 A.D.). *Religious Education*, 112(4), 339–350. <https://doi.org/10.1080/00344087.2016.1224001>
- Bessa, B. R., Dos Santos, S. C., & Da Fonseca, L. (2017). Using a virtual learning environment for Problem-Based Learning adoption: A case study at a high school in India. *Proceedings - Frontiers in Education Conference, FIE, 2017-Octob*, 1–7. <https://doi.org/10.1109/FIE.2017.8190642>
- Borges, M. C., Chachá, S. G. F., Quintana, S. M., Freitas, L. C. C., & Rodrigues, M. L. V. (2014). Problem-based learning. *Medicina (Brazil)*, 47(3), 301–307. <https://doi.org/10.11606/issn.2176-7262.v47i3p301-307>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>

- Budiyanti, N., Komariah, K. S., Hermawan, W., & Hyangsewu, P. (2024). IMPACT OF THE ULÛ AL-ILM MODEL ON SIX DOMAINS OF STUDENT LEARNING OUTCOMES IN ISLAMIC RELIGIOUS EDUCATION. *Jurnal Pendidikan Islam*, 10(1), 113–124. <https://doi.org/10.15575/jpi.v10i1.33225>
- Chapman, J. D., McNamara, S., Reiss, M. J., & Waghid, Y. (2014). International handbook of learning, teaching and leading in faith-based schools. In *International Handbook of Learning, Teaching and Leading in Faith-Based Schools*. <https://doi.org/10.1007/978-94-017-8972-1>
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Das, S., Nandgaonkar, V., Eklarker, R., Balkhande, B. W., & Pande, S. D. (2023). Exploring the dynamics of pbl-based learning: A study on collaboration, reflection, engagement, critical thinking, and student success. In *Design and Implementation of Higher Education Learners' Learning Outcomes (HELLO)* (pp. 146–158). <https://doi.org/10.4018/978-1-6684-9472-1.ch009>
- de Araújo, M. V. P., de Araújo, A. G., & Brito, M. I. D. M. (2018). Constrains and challenges of learning experience with problem based learning: A pilot study in the perception of students of the marketing discipline of the course of administration of the Federal University of Rio Grande do Norte –UFRN. *International Symposium on Project Approaches in Engineering Education*, 8, 528–535. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85054684760&partnerID=40&md5=861948d72aeb83136680be0976671db0>
- De Witte, K., & Rogge, N. (2016). Problem-based learning in secondary education: evaluation by an experiment. *Education Economics*, 24(1), 58–82. <https://doi.org/10.1080/09645292.2014.966061>
- Elena-Mirela, S., Cristina, T., & Rață, G. (2015). Approaches to the use of problem-based learning in students majoring in land survey and environmental protection. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM*, 3(5), 829–832. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84946559945&partnerID=40&md5=4827ed8a65339288d5724c8db195893a>
- Faisal, M., Za, T., Siswanto, R., & Darajat, J. (2021). The Integration Of Kkni, Snpt, And The Integration-Interconnection Paradigm In Curriculum Development At Ptki. *Jurnal Ilmiah Peuradeun*, 9(2), 309–328. <https://doi.org/10.26811/peuradeun.v9i2.528>
- Felsenthal, I., & Agbaria, A. (2023). How to Read the Quran in Religious Islamic Education: What Educators Can Learn from the Work of Mohammed Arkoun. *Religions*, 14(1), 129. <https://doi.org/10.3390/rel14010129>
- Felsenthal, I., & Agbaria, A. (2025). 'Justice before god': critical Islamic education based on the work of Tariq Ramadan. *British Journal of Religious Education*. <https://doi.org/10.1080/01416200.2025.2480655>
- Fernandes-Osterhold, G. (2022). Diversity and Inclusion in Integral Education: A Teaching Perspective of Integral Psychology. *Journal of Transformative Education*, 20(1), 24–43. <https://doi.org/10.1177/15413446211006646>
- García-Planas, M. I., Taberna, J., & Domínguez-García, S. (2021). The Problem-Based Learning Through the E-portfolio as a Methodological Basis for the Acquisition of the Transversal Competence of Solidarity and Social Commitment in Mathematics Subjects. In *Trends in Mathematics* (Vol. 13, pp. 203–210). https://doi.org/10.1007/978-3-030-76413-5_23
- Gregori-Giralt, E., & Menéndez-Varela, J.-L. (2015). The perception of Fine Arts students regarding

learning in settings of Problem Based Learning. *Revista Mexicana de Investigacion Educativa*, 20(65), 481–506. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84928109999&partnerID=40&md5=c9ffa78298cdae05fc80b6f5d46b38b2>

- Harahap, E. (2023). Exploring the Principles and Models of Transformative Islamic Religious Education Learning: Building Spiritual Awareness and Independence of Thought. *Al-Murabbi*, 1(1), 113–127. <https://doi.org/10.62086/al-murabbi.v1i1.427>
- Harasym, P. H., Tsai, T.-C., & Munshi, F. M. (2013). Is problem-based learning an ideal format for developing ethical decision skills? *Kaohsiung Journal of Medical Sciences*, 29(10), 523–529. <https://doi.org/10.1016/j.kjms.2013.05.005>
- Haryani, F. Y., Hidayatullah, M. F., & Yusuf, M. (2019). Problem-based learning for teaching Fiqh: An overview of its impact on critical thinking skill. *AIP Conference Proceedings*, 2194. <https://doi.org/10.1063/1.5139770>
- Hashim, R. (2017). The curriculum of Islamic studies and Islamic studies education programs in meeting the challenges of globalization: A case study of selected Malaysian universities. *Al-Shajarah, Special Issue*, 1–31. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85039922318&partnerID=40&md5=94866e8fe7541cae3698e7cb962cc75a>
- Hudri, S., & Al Haj Zaini, Z. (2023). Implementation of the Bahtsul Masa'il Method in Improving Ability to Read the Book of Fathul Qorib. *Munaddhomah*, 4(4), 1008–1018. <https://doi.org/10.31538/munaddhomah.v4i4.729>
- Hung, W., & Amida, A. (2020). Problem-Based Learning in College Science. In *Active Learning in College Science: The Case for Evidence-Based Practice* (pp. 325–339). https://doi.org/10.1007/978-3-030-33600-4_21
- Imafuku, R. (2012). Japanese first-Year PBL students' learning processes: A classroom discourse analysis. In *Problem-Based Learning in Clinical Education: The Next Generation* (pp. 153–170). https://doi.org/10.1007/978-94-007-2515-7_10
- Ismail, K., Shaikh Ali, S. H., & Mohd Sharifuddin, S. (2024). Digitalization in Education and its Impacts in Teaching and Learning. In *Lecture Notes in Educational Technology* (Vol. 2024, pp. 36–45). https://doi.org/10.1007/978-981-97-4507-4_4
- Isna, R., & Masykuri, M. (2018). Achievement of learning outcome after implemented physical modules based on problem based learning. *Journal of Physics: Conference Series*, 983(1). <https://doi.org/10.1088/1742-6596/983/1/012026>
- Khatiban, M., Falahan, S. N., Amini, R., Farahanchi, A., & Soltanian, A. (2019). Lecture-based versus problem-based learning in ethics education among nursing students. *Nursing Ethics*, 26(6), 1753–1764. <https://doi.org/10.1177/0969733018767246>
- Khazen, M. (2024). Fostering Decision-Making and Ethics: Problem-Based Learning for Female Tertiary Learners in Israel. *European Journal of Educational Research*, volume-13-(volume-13-issue-3-july-2024), 1077–1091. <https://doi.org/10.12973/eu-jer.13.3.1077>
- Knoblauch, C., & Tamer-Uzun, G. S. (2023). Learning in Encounter: Collaborative and Project-Based Strategies for Learning in Culturally and Religiously Diverse Contexts in the Higher Education Sector. *Lecture Notes in Networks and Systems*, 767 LNNS, 263–275. https://doi.org/10.1007/978-3-031-41637-8_21
- Knöpfel, M., Kalz, M., & Meyer, P. (2024). General Problem-solving Skills Can be Enhanced by Short-time Use of Problem-Based Learning (PBL). *Journal of Problem Based Learning in Higher Education*, 12(1), 72–91. <https://doi.org/10.54337/ojs.jpblhe.v12i1.7871>

- Lee, Y.-C. (2025). Changes in Learning Outcomes of Students Participating in Problem-Based Learning for the First Time: A Case Study of a Financial Management Course. *Asia-Pacific Education Researcher*, 34(1), 511–530. <https://doi.org/10.1007/s40299-024-00873-y>
- Lu, J., Bridges, S., & Hmelo-Silver, C. E. (2014). Problem-based learning. In *The Cambridge Handbook of the Learning Sciences, Second Edition* (pp. 298–318). <https://doi.org/10.1017/CBO9781139519526.019>
- Madhavi, K. B., Mosherani, V., & Anadakumar, A. (2024). Empowering Engineering Ethics: Integrating Project-Based Learning for Holistic Student Development in VLSI Education. *Journal of Engineering Education Transformations*, 38(Special Issue 1), 127–132. <https://doi.org/10.16920/jeet/2024/v38is1/24221>
- Mao, Y. (2021). Moral Values Education is the Core of Moral Education in Colleges and Universities. *ACM International Conference Proceeding Series*, 554–556. <https://doi.org/10.1145/3452446.3452581>
- Mesbah, T., Abouzeid, E., Hassan, N., Ghaly, M., & Talaat, W. (2025). Mapping Change: The Effect of Using Concept Mapping on the Students' Engagement and Performance in Problem-based Learning Tutorials. *Health Professions Education*, 11(1), 27–35. <https://doi.org/10.55890/2452-3011.1315>
- Muhamad, A., Khalil, S. A., Basir, S. A., & Norasid, M. A. (2024). Instilling Islamic Values of Environmental Sustainability Through Experiential Learning: A Case Study of Revealed Knowledge and Natural Phenomena's Students. *Asia Pacific Journal of Educators and Education*, 39(2), 219–248. <https://doi.org/10.21315/apjee2024.39.2.12>
- Muhd Darus, N., Mohd, H., Baharom, F., Ali Saip, M., Puteh, N., At Matt, Z. M., Husain, M. Z., & Yasin, A. (2016). Best practices of problem-based learning implementation for IT courses from students perspectives. *Journal of Telecommunication, Electronic and Computer Engineering*, 8(8), 139–143. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85011422078&partnerID=40&md5=eae2b1ccf788b60b1068b3e46dbcbfb8>
- Musa, S., & Nurhayati, S. (2021). Analysis of counting learning difficulties in illiterate adults. *AIP Conference Proceedings*, 2331(1), 020033. <https://doi.org/10.1063/5.0041739>
- Mustari, M., & Nurhayati, S. (2024). Multifaceted Instructional Leadership of School Principals to Improve Student Character in The Digital Era. *Al-Hayat: Journal of Islamic Education*, 8(2), 488. <https://doi.org/10.35723/ajie.v8i2.459>
- Naik, S. M., Bandi, S., & Reddy, C. L. (2024). Enhancing Engineering Education: Exploring the Impact of Problem-Based Learning on Freshman Students' Skills and Engagement – A Case Study. *Journal of Engineering Education Transformations*, 38(Special Issue 1), 133–139. <https://doi.org/10.16920/jeet/2024/v38is1/24222>
- Nawi, A., & Zakaria, G. A. N. (2019). The impact of applying religious values through online problem-based learning among undergraduate students: A quasi-experimental study. *International Journal of Learning, Teaching and Educational Research*, 18(8), 192–213. <https://doi.org/10.26803/ijlter.18.8.12>
- Nemakhavhani, R. B. (2024). Enhancing Student Engagement Through Problem-Based Learning: A Case of the Built Environment. *Proceedings of the International Conference on Education Research, ICER 2024*, 247–254. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85216068550&partnerID=40&md5=107382ffbf3453b1c17e2da8a7bc5b24>
- Nugraha, T. C., Abdel Rahim, E.-S. E.-S. A., & Lukman, F. (2024). Integrating Problem-Based And

- Flipped Learning In Islamic Religious Education: A Pathway To Achieving Sustainable Development Goals. *Jurnal Pendidikan Islam*, 10(1), 125–136. <https://doi.org/10.15575/jpi.v10i1.35204>
- Nurhayati, S. (2024). Digital literacy in adult continuing education: implementation, best practices, and emerging trends. *Novateur Publications*, 1(1), 9–18. <https://novateurpublication.org/index.php/np/article/view/237>
- Nurhayati, S., Fitri, A., Amir, R., & Zalisman, Z. (2024). Analysis of the Implementation of Training on Digital-based Learning Media to Enhance Teachers' Digital Literacy. *AL-ISHLAH: Jurnal Pendidikan*, 16(1), 545–557. <https://doi.org/10.35445/alishlah.v16i1.4029>
- Nurhayati, S., & Parhan, M. (2024). A Complete Approach in Implementing Islamic Early Childhood Character Education at the Pandemic Covid 19 Era. *Naturalistic: Jurnal Kajian Dan Penelitian Pendidikan Dan Pembelajaran*, 9(1), 541–549.
- O'Brien, R., McGarr, O., & Lynch, R. (2022). Students' perceptions of lecturer power and authority in a higher education PBL business programme. *Teaching in Higher Education*, 27(5), 615–631. <https://doi.org/10.1080/13562517.2020.1725881>
- Omar, M. T. M. (2022). The Effectiveness of the Problem-Solving Strategy in Enhancing the Academic Achievement of Islamic Studies Students at a Saudi College. *Journal of Education and E-Learning Research*, 9(3), 129–135. <https://doi.org/10.20448/jeelr.v9i3.4101>
- Papakostas, C. (2024). Faith in Frames: Constructing a Digital Game-Based Learning Framework for Religious Education. *Teaching Theology & Religion*, 27(4), 137–154. <https://doi.org/10.1111/teth.12685>
- 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>
- Plaza-Angulo, J. J., & López-Toro, A. A. (2025). Problem-Based Learning: Advantages and Disadvantages Perceived by Students. *Revista Colombiana de Educacion*, 96. <https://doi.org/10.17227/rce.num96-19777>
- Plummer, K., Taeger, S., & Burton, M. (2020). Decision-based learning in religious education. *Teaching Theology and Religion*, 23(2), 110–125. <https://doi.org/10.1111/teth.12538>
- Ratnawulan, S., Nurhayati, S., Taufikin, Lotfi, F. Z., & Olugbade, D. (2025). Leveraging Digital Technology to Strengthen Adult Education and Engagement in Islamic Study Group (Majlis Ta'lim). *Journal of Education Research*, 6(1), 79–89. <https://doi.org/10.37985/jer.v6i1.2280>
- Razali, R., Sundana, L., & Ramli, R. (2024). Curriculum Development in Higher Education in Light of Culture and Religiosity: A Case Study in Aceh of Indonesia. *International Journal of Society, Culture and Language*, 12(1), 39–55. <https://doi.org/10.22034/ijsc.2023.2010108.3144>
- Rohman, F. (2022). Problem Based Learning in Islamic Religious Education: The Case of the Indonesian Pesantren. *Global Journal Al-Thaqafah*, 12(1), 82–97. <https://doi.org/10.7187/GJAT072022-5>
- 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>
- Safitri, Y., & Nurhayati, S. (2023). Sex education using problem-based learning approach: an effort to raise adolescent awareness of the dangers of promiscuity. *Jurnal Simki Pedagogia*, 6(2), 279–286.
- Sakir, N. A. I., & Kim, J. G. (2020). Enhancing Students' Learning Activity and Outcomes via

- Implementation of Problem-based Learning. *Eurasia Journal of Mathematics, Science and Technology Education*, 16(12). <https://doi.org/10.29333/EJMSTE/9344>
- 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>
- Santos Meneses, L. F. (2020). Critical thinking perspectives across contexts and curricula: Dominant, neglected, and complementing dimensions. *Thinking Skills and Creativity*, 35. <https://doi.org/10.1016/j.tsc.2019.100610>
- Savin-Baden, M. (2016). The impact of transdisciplinary threshold concepts on student engagement in problem-based learning: A conceptual synthesis. *Interdisciplinary Journal of Problem-Based Learning*, 10(2). <https://doi.org/10.7771/1541-5015.1588>
- Shimizu, I., Matsuyama, Y., Duvivier, R., & van der Vleuten, C. (2021). Contextual attributes to promote positive social interdependence in problem-based learning: a focus group study. *BMC Medical Education*, 21(1). <https://doi.org/10.1186/s12909-021-02667-y>
- Sholeh, M. I., Haris, M., 'azah, N., Shobirin, M. S., Wahrudin, B., Muzakki, H., Ismail, T., & Ali, H. (2024). The Role of Teachers in Increasing Students' Learning Motivation in Islamic Religious Education. *Jurnal Pendidikan Agama Islam*, 21(2), 421–441. <https://doi.org/10.14421/jpai.v21i2.8846>
- Storey, V. A., & Schiavo, M. A. (2013). Redefining the higher education landscape through problem-based learning. In *Handbook of Research on Teaching and Learning in K-20 Education* (pp. 517–534). <https://doi.org/10.4018/978-1-4666-4249-2.ch030>
- Suyitno, S., & Chotimah, C. (2025). Guided Inquiry vs. Conventional Methods: Shaping Learning Outcomes in Islamic Religious Education. *International Research Journal of Multidisciplinary Scope*, 6(1), 552–559. <https://doi.org/10.47857/irjms.2025.v06i01.02275>
- Taesotikul, T., Chinpaisal, C., & Nawanopparatsakul, S. (2021). Kahoot! gamification improves learning outcomes in problem-based learning classroom. *ACM International Conference Proceeding Series*, 125–129. <https://doi.org/10.1145/3468978.3468999>
- Tiarawati, P. V., Nurhayati, S., Hidayah, S. N., & Boriboon, G. (2023). Blended Learning Approach Implementation to Improve Adults' Tahsin Ability in the Digital Era. *Cendekia: Jurnal Kependidikan Dan Kemasyarakatan*, 21(2), 180–196. <https://doi.org/http://dx.doi.org/10.21154/cendekia.v21i2.7111>
- Tongpaeng, Y., & Thongsibsong, N. (2013). Enhancement of multimedia education through practical rural development project: The case study of Royal Project Sa Ngo. *13th International Symposium on Communications and Information Technologies: Communication and Information Technology for New Life Style Beyond the Cloud, ISCIT 2013*, 776–780. <https://doi.org/10.1109/ISCIT.2013.6645960>
- Ulfat, F. (2020). Empirical research: Challenges and impulses for Islamic religious education. *British Journal of Religious Education*, 42(4), 415–423. <https://doi.org/10.1080/01416200.2020.1711513>
- Wahab, R. B. H. A., Ahmad, S. B., & Owoyemi, M. Y. (2019). The impact of religious education subjects on the formation of muslim girls' identity: A comparative study of girls' secondary school in Kedah, Malaysia and Leeds, Britain. *Journal of Social Sciences Research*, 5(3), 665–675. <https://doi.org/10.32861/jssr.53.665.675>

- Wang, V. C. X., & Cranton, P. (2016). Transformative learning and technology in adult and vocational education. In *Exploring the New Era of Technology-Infused Education* (pp. 34–48). <https://doi.org/10.4018/978-1-5225-1709-2.ch003>
- Widyawati, E., & Nurhayati, S. (2023). Practical Implementation Strategies of Tartila Method for Improving Early Childhood's Al Qur'an Reading Literacy. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 7(6), 6687–6699.
- Wu, W.-C. V., Lee, Y.-T. E., Yang, J. C., Debataraja, S. M., & CHEN Hsiehd, J. S. (2018). Adopting a PBL approach to empower EFL learners. *ICCE 2018 - 26th International Conference on Computers in Education, Workshop Proceedings*, 644–647. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85060018263&partnerID=40&md5=e5afc123bde2241ee7fe9161cd0d215f>
- Yani, M. T., Hazin, M., & Hanafi, Y. (2023). Educational Experience Insertion Model Of Religious Moderation And National Defence As Efforts To Prevent Radicalism And Communism Via Islamic Religious Education Instructions. *Artseduca*, 2023(36), 111–124. <https://doi.org/10.6035/artseduca.3610>
- Yew, E. H. J., & Goh, K. (2016). Problem-Based Learning: An Overview of its Process and Impact on Learning. *Health Professions Education*, 2(2), 75–79. <https://doi.org/10.1016/j.hpe.2016.01.004>
- Zhao, W., Li, X., & Chen, Z. (2024). Research on PBL Teaching in Engineering Graphics from the Perspective of Constructivist Theory. In *Lecture Notes on Data Engineering and Communications Technologies* (Vol. 216, pp. 244–250). https://doi.org/10.1007/978-3-031-71225-8_22

About the Contributor(s)

Amirudin, PhD in Islamic Education, Associate Professor in the Master's Program in Islamic Education, Universitas Singaperbangsa Karawang, Karawang, Indonesia.

Email: amirudin@staff.unsika.ac.id

ORCID: <http://orcid.org/0000-0003-2763-8306>

Iqbal Amar Muzaki, PhD in Islamic Education, Assistant Professor at the Undergraduate Program of Islamic Education, Universitas Singaperbangsa Karawang, Karawang, Indonesia.

Email: iqbalamar.muzaki@staff.unsika.ac.id

ORCID: <http://orcid.org/0000-0002-7815-0522>

Sri Nurhayati, PhD in Community Education, Associate Professor of Community Education, IKIP Siliwangi, Cimahi, West Java, Indonesia.

Email: srinurhayati@ikipsiliwangi.ac.id

ORCID: <https://orcid.org/0000-0002-2273-9143>

Publisher's Note: The opinions, statements, and data presented in all publications are solely those of the individual author(s) and contributors and do not reflect the views of Universitepark, EDUPIJ, and/or the editor(s). Universitepark, the Journal, and/or the editor(s) accept no responsibility for any harm or damage to persons or property arising from the use of ideas, methods, instructions, or products mentioned in the content.
