

The Effect of Blended Problem-Based Learning on Strengthening Islamic Character Values: A Meta-Analysis of Islamic Education Studies

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ABSTRACT

Islamic character education is a critical component of Islamic Religious Education (IRE), aiming to cultivate values such as honesty, responsibility, and social concern. In response to the challenges of modern education, Blended Problem-Based Learning (Blended-PBL) is proposed as an innovative approach to foster these values among students. This study employs a meta-analysis approach to examine the effect of Blended-PBL on strengthening Islamic character values in students. A systematic literature search was conducted across ERIC, Scopus, Wiley, and Google Scholar databases for studies published between 2020 and 2025. Of 119 articles identified, 10 met the inclusion criteria. Data were analyzed using the JASP software, applying a random-effects model to calculate pooled effect sizes and assess heterogeneity and publication bias. The analysis revealed a significant positive effect of Blended-PBL on strengthening Islamic character values (pooled effect size = 0.692; $t = 6.403$; $p < 0.001$), with moderate to high effect sizes across studies. The heterogeneity test indicated variation among studies ($Q = 29.124$; $p < 0.001$), justifying the use of a random-effects model. Egger's test showed no evidence of publication bias ($p = 0.078$). Findings suggest that Blended-PBL is an effective pedagogical model in IRE contexts, supporting not only cognitive development but also character formation. This model integrates reflective, contextual learning with digital flexibility, offering practical implications for value-based Islamic education in higher institutions.

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1. INTRODUCTION

Strengthening Islamic character values in the world of education is a fundamental element that cannot be ignored, especially in the formation of a generation with integrity and noble character (Hidayat et al., 2023 Purwati et al., 2018). Education is not only a means of transferring knowledge, but also a vehicle for moral, ethical, and spiritual development of students. In the context of Islamic education, values such as honesty (*sidq*), responsibility (*amanah*), tolerance (*tasāmuḥ*), and social concern (*ta'āwun*) are the main foundations in shaping a true Muslim personality (Rustan et al., 2018). Therefore, strengthening the character of Islam is a necessity that must be integrated in the learning process, so that students are not only intellectually intelligent, but also have integrity and commitment to religious values (Muzammil, 2019).

Students enrolled in the Islamic Religious Education Study Program hold a strategic role in internalizing and transmitting Islamic values within society (Suyadi, 2019; Setiawan, 2019; Al Arood et al., 2020). As prospective educators, they are expected not only to demonstrate strong academic mastery of instructional materials but also to serve as role models in embodying Islamic character values in their daily lives (Syarif, 2020). The character quality of religious teachers significantly influences the effectiveness of value-based education in schools, as character formation is more effectively developed through exemplary behavior than through lectures or theoretical instruction alone. Consequently, strengthening Islamic character among PAI students represents a long-term investment in ensuring the continuity and success of transformative and sustainable Islamic education (Saregar et al., 2021).

In the era of globalization and digitalization that is so fast, the challenge of internalizing Islamic values is increasingly complex and multidimensional. Unlimited access to information through digital technology facilitates the flow of foreign cultures into the lives of the younger generation, including students and college students, who are often not accompanied by adequate cultural and spiritual literacy skills (Abduh et al., 2020; Anshori, 2021). This causes a disorientation of values, where Islamic values that should be the guideline of life are instead displaced by an instantaneous, individualistic, and materialistic lifestyle. According to Hidayatullah (2010), globalization has had a significant influence on changes in attitudes, behaviors, and mindsets of the younger generation who tend to move away from local religious and cultural values.

The moral crisis that hit some students and students is also an indicator of the weak internalization process of religious values in the education system (Suhirman et al., 2021; Uyun, 2025). Phenomena such as social media abuse, hedonism, verbal violence, and even cases of academic plagiarism, show that affective and spiritual aspects have not been optimally integrated in learning. According to Zubaedi (2011), character education based on Islamic values must be an integrated part of the educational process to form human beings who are not only intellectually intelligent, but also have moral integrity and Islamic personality. Therefore, a learning approach is needed that not only emphasizes the cognitive aspect, but also makes room for a holistic process of reflection, direct experience, and value formation (Muslimin et al., 2020.; Solichin et al., 2021).

In the world of modern education, especially Islamic education, a learning approach that only focuses on the cognitive aspect is considered inadequate to form a complete person (Priyanto & Dharin, 2021; Wantu et al., 2024; Ali et al., 2024). Innovative and holistic learning strategies are needed that are able to touch the affective and spiritual aspects of students, so that Islamic values are not only understood theoretically, but also internalized and manifested in real behavior. Learning that combines cognitive, affective, and spiritual elements can strengthen students' character and increase their religious awareness in daily life (Jamilah, 2021; Assa'idi, 2021; Hussien et al., 2021). In line with that, Jalaluddin (2007) emphasized that true Islamic education is an education that is able to foster spiritual awareness and form noble morals through a learning process that is not only rational but also emotional and transcendental. Therefore, the integration of innovative learning models, namely Blended Learning and Problem-Based Learning, is a strategic solution in providing learning that is not only informative but also transformative (Chaidam & Poonputta, 2022).

Blended Learning is defined as a thoughtful integration between in-person and online instruction, thus leveraging the advantages of both modes to support immersive and meaningful learning experiences (Garrison & Kanuka, 2004; Bayram & Deveci, 2022); (A. Muhajir, 2022). Meanwhile, Problem Based Learning (PBL) is an instructional method in which students learn through facilitated problem-solving, centered on complex problems that do not have a single answer, thus encouraging the development of high-level thinking strategies, independent learning, and group collaboration. The integration of the Blended-PBL model blends the flexibility of the digital environment with the contextual approach of PBL, resulting in a hybrid model that not only develops cognitive abilities, but also encourages affective engagement and reflective practice (Servos et al., 2023; Omar, 2022; Wijayati et al., 2022). This blended PBL approach has proven to be feasible and does not sacrifice learning outcomes, while offering a variety of interaction and scaffolding modalities for students. This model opens up opportunities to internalize values through the context of authentic issues and online discourse, so as to strengthen the Islamic character holistically.

Various empirical studies have explored the effectiveness of the Blended-PBL model in the context of Islamic education, with a primary focus on improving learning outcomes and critical thinking skills. Hamzah et al. (2022) reported that the application of Blended Learning combined with PBL in Islamic Studies courses significantly improved student academic achievement. Similarly, Zamroni et al. (2020) found that Blended-PBL was effective in improving the critical thinking skills of guidance and counselling students. However, most of these studies have focused more on the cognitive and metacognitive domains, while direct measurements of the strengthening of Islamic character values are still very limited. On the other hand, when the Islamic character becomes part of the variables being measured, the methodology and results show considerable diversity. For example, Nurkhin et al. (2020) applied Blended-PBL in accounting studies and reported an increase in critical thinking skills, but did not evaluate Islamic character dimensions such as honesty or responsibility. Tambak et al. (2022) included PBL elements in the blended learning model in Islamic Studies courses and noted an increase in religiosity and a sense of social responsibility through qualitative observation, but without using standard instruments to measure character change. These variations in research design, measurement instruments, and theoretical frameworks result in inconsistent findings, so that until now, there is no general conclusion that can generalize the influence of Blended-PBL on the strengthening of Islamic character values. Based on this, this study aims to analyze the influence of the blended project-based learning model on the strengthening of the character values of Islamic religious learning students through meta-analysis and whether there is a publication bias in this study.

2. METHODS

This study employs a systematic literature review and meta-analysis approach to examine research related to the selected topic (Servos et al., 2023; Wijnia et al., 2024). The meta-analysis procedure in this research consists of several stages, including the development of the research protocol, the establishment of eligibility criteria, and the identification of relevant sources of information and studies (Fajrie et al., 2023). These stages were designed to ensure a structured and transparent process in collecting, selecting, and analyzing the relevant literature.

The eligibility criteria applied in this study include the following: (1) studies that examine the effect of blended problem-based learning on strengthening Islamic character values in students; (2) articles published in English between 2020 and 2025; and (3) research related to blended learning, problem-based learning, Islamic character values, and Islamic Religious Education (PAI). The sources of information were obtained from several academic databases, including Scopus, Wiley, ERIC, and Google Scholar. The keywords used in the search process were "blended learning," "problem-based learning," "character values," and "PAI learning." Based on the selection process, 10 relevant articles were identified for further analysis (Figure 1). The data filtering process followed the PRISMA method,

which includes the stages of identification, screening, eligibility assessment, and final inclusion of studies.

The study selection process began by identifying and extracting references into Microsoft Excel to detect and remove duplicate articles. Subsequently, the researchers reviewed the abstracts of the identified studies using the defined search strategy to determine whether the studies aligned with the focus on the implementation of blended problem-based learning in strengthening students' character values. The data analysis in this study involved determining the effect size (Z) and the standard error of the effect size (Sez). The collected data were then analyzed using the JASP application. The calculation of the effect size and its standard error was conducted using the following formula.

$$z = 0.5 \times \ln \frac{1+r}{1-r}$$

Equation 1. Effect Size

$$V_z = \frac{1}{N-3}$$

$$SE_{Xz} = \sqrt{V_z}$$

Equation 2. Standar error

Interpreting effect size values with JASP helps determine whether publication bias is present. The effect size value criteria in this study can be seen in Table 1.

Table 1. Effect Size Value Criteria

Effect Size	Category
$0.0 \leq ES \leq 0.2$	Low
$0.2 \leq ES \leq 0.8$	Medium
$ES \geq 0.8$	High

Source: (Borenstein et al., 2007; Bachtiar et al., 2023; Tamur et al., 2020)

Data on research samples, effect size, standard errors, heterogeneity tests, and publication bias are presented in the form of a table. Meta-analysis was carried out by calculating heterogeneity using random effect size to find out the average variables that affect the variables of character value strengthening in students. The publication bias test uses a p-value of > 0.05 by conducting a funnel plot analysis and an Egger's test. If the results of the funnel plot analysis and Egger's test > 0.05 , it means that there is no publication bias.

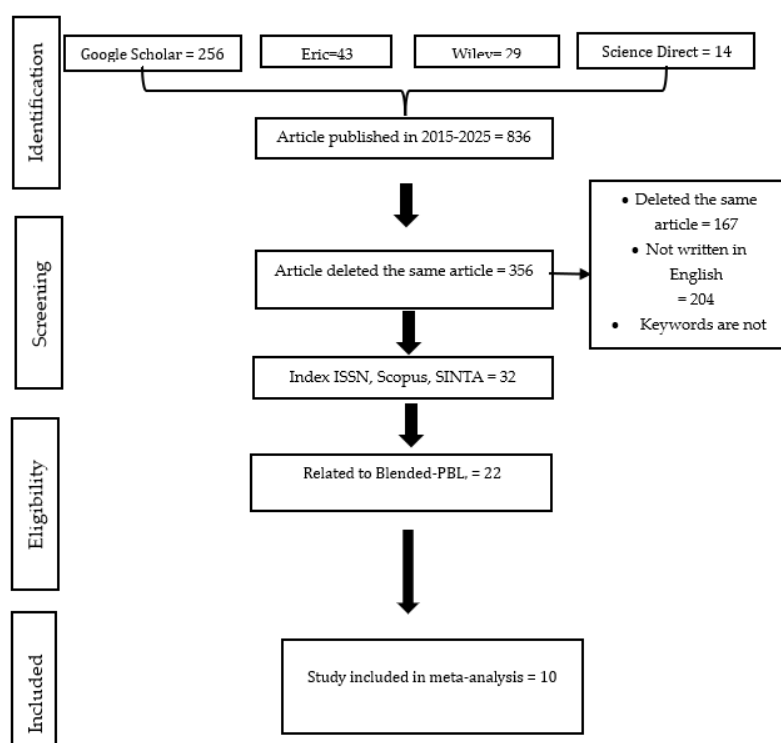


Figure 1. PRISMA Flow Diagram

3. FINDINGS AND DISCUSSION

Based on the results of the data search through the database, 10 studies/articles met the inclusion criteria. The effect size and error standard can be seen in Table 2.

Table 2. Effect Size and Standard Error in Every Research

Author	Vz	Z	SEz
(Hamzah et al., 2022)	0.00431	0.42	0.17
(Firdaus et al., 2019)	0.03290	0.37	0.06
(Eljabily & Al-Shehri, 2024)	0.00182	0.51	0.25
(Niman et al., 2024)	0.04381	0.83	0.27
(Bima et al., 2024)	0.02087	1.01	0.28
(Suwendra et al., 2023)	0.00105	0.66	0.18
(Sari et al., 2025)	0.04117	1.53	0.38
(Irwandi et al., 2022)	0.00108	0.82	0.34
(Boonchom, 2024)	0.03013	1.14	0.20
(Wahab et al., 2025)	0.00082	0.46	0.11

Based on Table 2, the effect size value of the 10 studies ranged from 0.37 to 1.53. According to Borenstein et al., (2007) the 10 effect sizes, 4 studies had medium effect sizes and 6 studies had high effect size values. Based on the results of the data test based on JASP outputs, the following results were obtained:

3.1 Heterogeneity Test

Furthermore, analyze the heterogeneity test of the ten analyzed studies which can be seen in Table 3.

Table 3. Residual Heteroneity test

Q_c	df	P
29.124	9	< 0.001

Based on Table 3. The results of the heterogeneity test analysis showed that 10 researchers had a heterogeneous distribution ($Q_c = 19,124$; $P < 0.001$). With this, random effect size is effective to estimate the average effect size of the 10 studies analyzed. The results of the analysis showed that blended problem-based learning had an effect on strengthening character values in students.

3.2 Hypothesis Test

Next, calculate the p-value to test the hypothesis through the random effect model. The results of the summary effect model analysis with the random effect model can be seen in Table 4.

Table 4. Pooled Effect Size Test

Estimate	Standard error	t	df	P
0.692	0.108	6.403	9	< 0.001

Table 4. The results of the analysis of the average value of effect size with the random effect model showed that there was a positive influence between the blended project-based learning model on strengthening character values in Islamic religious education students ($t = 6,403$; $p < 0.001$).

3.3 Publication Bias

Checking publication bias through funnel plot analysis and Rosenthal fail safe N (FSN) test (Tamur et al., 2020; Badawi et al., 2022; Ichsan et al., 2023b; Borenstein et al., 2007). The results of checking publication bias with funnel plot can be seen in Figure 2.

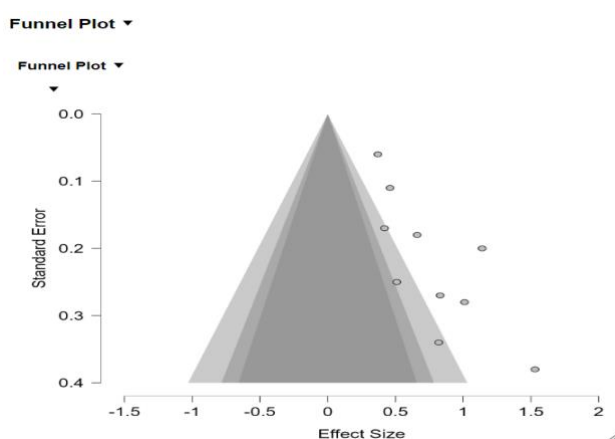


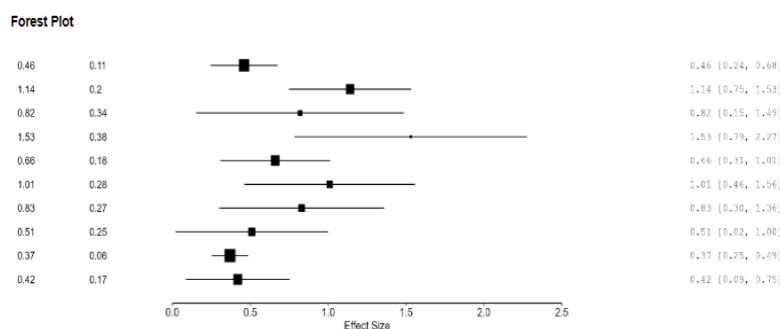
Figure 2. Funnel Plot

Based on Figure 1, the analysis of the funnel plot is not yet known whether it is symmetrical or asymmetrical, so it is necessary to conduct a Egger's test. The results of the Egger's test calculation can be seen in Table 5.

Table 5. Egger's Test

	z	p
Sei	1.019	0.078

Based on Table 5, the Z value is 1.019 and the p-value is 0.078 more than the sig value. 0.05 means that there is no publication bias in this study. Next, the forest plot analysis can be seen in figure 3.

**Figure 3. Forest Plot**

Based on the forest plot analysis, it can be observed that the analyzed articles have values that vary between 0.37 and 1.14, with a summary effect size value of 0.692. This finding explains that blended problem-based learning has an effect on strengthening character values in PAI students in the medium category. The Blended-Problem-Based Learning (Blended-PBL) learning model has a significant influence in strengthening Islamic character values in Islamic Religious Education students. The overall effect size of the several studies analyzed showed a moderate category, indicating that the integration of online and offline learning based on problem solving is able to create a learning atmosphere that is not only cognitive, but also affective and spiritual (Mahfudz & Sukarno, 2023; Shafa, 2022) These findings show the urgency of implementing a contextual and reflective learning model in Islamic education. Blended learning allows students to gain flexibility in the learning process and strengthen their involvement in activities that build Islamic character, such as honesty, responsibility, and cooperation (Susilo, 2023; Susanto et al., 2023). According to (Karwadi et al., 2024), this approach not only brings together the advantages of online and face-to-face learning but also creates a learning environment that encourages value reflection. This is evident in the increase in character dimensions such as Amanah and *ukhuwah islamiyah* in the research subjects.

Problem-Based Learning encourages students to identify real problems, discuss collaboratively, and offer solutions based on Islamic principles. This creates a learning experience that fosters values such as justice (*adl*), responsibility (*Mu'awiyah*), and social care (*ta'awun*). According to (M. Muhajir et al., 2024) PBL is effective in forming values-based critical thinking skills, which are very relevant in the context of Islamic character education. The Problem-Based Learning model plays an important role in encouraging students to identify real problems and solve them with an approach that is in accordance with Islamic principles. This process trains students to think critically and solutively while considering ethical values, such as justice (*adl*), responsibility (*mas'uliyah*), and mutual help (*ta'awun*). Barrows (1996) states that PBL not only builds analytical skills, but also facilitates value-based learning in social and moral contexts (Wahab et al., 2025; Boonchom, 2024).

Further analysis results show that the effectiveness of Blended-PBL may vary based on the research design, education level, and character indicators measured. Studies with pseudo-experimental designs showed a higher effect value than quasi-experimental studies, while application at the college level resulted in more significant character enhancement than at the high school level (Zheng & Cho, 2024). This is in line with the findings of (Karwadi et al., 2024) who emphasized the importance of controls in educational experiments to validly measure impact. Teachers need to consider the systematic and planned implementation of the Blended-PBL model as part of a 21st century learning

strategy. This approach is not only able to develop student cognition but also to foster ethical and spiritual awareness, which is the main goal of Islamic education (Fauzan & Saparuddin, 2023). As emphasized by (Omar, 2022), true Islamic education must integrate knowledge with values, so as to produce civilized people.

4. CONCLUSION

The results of the meta-analysis show that Blended Problem-Based Learning (Blended-PBL) has a significant positive effect on strengthening Islamic character values in students. This model has been shown to be effective in improving aspects such as honesty, responsibility, tolerance, and social concern. The effectiveness of Blended-PBL tends to be higher at the secondary education level and when combined with reflective activities and experiential learning. These findings show that the Blended-PBL approach is not only relevant for improving cognitive abilities but also has great potential in instilling character values based on Islamic teachings. Meta-analysis in the field of Islamic religious education makes a significant theoretical contribution by systematically synthesizing empirical findings from various previous studies, thereby enabling the development of a more comprehensive and tested conceptual framework. By combining quantitative evidence across contexts, methods, and student characteristics, meta-analysis strengthens the validity of IRE learning theories such as the effectiveness of active learning models, the integration of Islamic values with modern pedagogical approaches, and the influence of affective, cognitive, and spiritual variables on learning outcomes.

Conflicts of Interest: The authors declare no conflict of interest. This study was conducted independently, and the authors assert that no financial, professional, or personal relationships can influence the work reported in this paper. All findings and interpretations presented reflect unbiased data analysis, unbiased data analysis, and no external influences affect the representation of research results.

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