ETDC Indonesian Journal of Research and Educational Review
Volume 4, No. 4, 2025, pp 1208 - 1218
e–ISSN 2809-3682
p–ISSN 2809-7505

https://doi.org/10.51574/ijrer.v4i4.3768

Project Based Learning in Physics Learning Material to Form Students' Islamic Character: A Systematic Literature Review

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Article Info

Article history:

Received June 29, 2025
Revised August 25, 2025
Accepted August 27, 2025

Keywords:

Islamic Character;
Islamic Values;
Newton's Laws;
Project Based Learning;
Physics Learning.

ABSTRACT

Physics learning on Newton's Laws often focuses only on the cognitive aspect, thus under-emphasizing the character and spiritual values of students. In fact, a comprehensive education should foster students holistically, encompassing intellectual, social, and religious aspects. This study intends to systematically examine the application of Project Based Learning (PjBL) in physics learning as a pedagogical strategy that not only improves students' understanding of Newton's Laws but also shapes their Islamic character. This study uses a systematic literature review method with the PRISMA approach, which involves the identification, screening, eligibility, and inclusion of 125 articles from various databases (Google Scholar, DOAJ, Scopus, etc.), until 30 relevant articles from the last 10 years are selected. The results of the study indicate that PjBL can improve students' conceptual understanding through contextual and collaborative project activities. In addition, PjBL is also effective in fostering character values such as responsibility, cooperation, and honesty, and it can be integrated with Islamic values through a thematic and reflective approach. In conclusion, the application of PjBL in physics learning improves students' cognitive quality and serves as an effective means of forming Islamic character. This study recommends the development of teaching tools that explicitly integrate PjBL with Islamic values.

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1. INTRODUCTION

Education in the 21st century necessitates a transition from a teacher-centered to a student-centered learning paradigm (Frasineanu & Ilie, 2017; Rakhmawati et al., 2024). In this environment, critical thinking skills, problem-solving ability, teamwork, and character are essential components of learning objectives (Yeung et al., 2023; Mantau & Talango, 2023). In practice, a significant portion of educational instruction remains exclusively focused on cognitive attainment, neglecting the emotive domain and character values (White & Shin, 2017; Arfah, 2021). This scenario leads to a tenuous integration of scientific principles with ethical norms, particularly in secondary school physics.

The study of physics is frequently regarded as challenging and unrelated to daily life (Bouchée et al., 2023). A contributing factor is a pedagogical method that lacks contextualization and neglects to include students' values or spiritual dimensions (Maulidi, 2020). Newton's Laws, for instance, are frequently taught in a mechanical manner, focusing on formulas and calculation difficulties, without linking them to life values or morals that could be imparted through the educational experience (Siddiqui & Ahmad, 2020). The discipline of physics can facilitate the development of Islamic virtues like honesty, accountability, cooperation, and perseverance (Khoiri et al., 2017). The issue of student character deterioration has been emphasized in numerous educational studies (Saffana & Subhi, 2023). The increase in aberrant behavior among students, including bullying, dishonesty, and diminished empathy, suggests that educational experiences are insufficient in cultivating student character (Andryawan et al., 2023; Hikmat et al., 2024). This underscores the need for education that emphasizes not only mastery of content but also the cultivation of a well-rounded personality (Kadir, 2015; Curren, 2017).

The Project-Based Learning (PjBL) model provides a pertinent answer to this issue (Umam & Jiddiyyah, 2020; Puspitaloka et al., 2024). Project-Based Learning (PjBL) prioritizes active student involvement in executing significant, real-world projects that amalgamate knowledge, skills, and values (Hussein, 2021; Pradana et al., 2023). This methodology facilitates the development of conceptual understanding in physics through contextual experiments or projects, while concurrently fostering character through teamwork, responsibility, and value reflection (Yusuf & Asrifan, 2020).

Numerous research studies indicate that Project-Based Learning (PjBL) is valuable in enhancing conceptual comprehension as well as in influencing students' attitudes and character (Handayani et al., 2015; Berhitu et al., 2020). The implementation of Project-Based Learning (PjBL) in scientific education enhances students' critical thinking abilities and sense of accountability (Mona & Rachmawati, 2023). Research indicates that the incorporation of Islamic principles in Project-Based Learning (PjBL) can enhance religious values, discipline, and collaboration among students (Laksono & Izzulka, 2022). The incorporation of Islamic principles in physics education is a strategic method for fostering Islamic character (Salwa, 2025). Experimental activities and project deliberations can manifest principles such as justice, trust (Tawakal), effort (ikhtiar), and reliability (Laksono & Izzulka, 2022). For instance, educators can connect Quranic verses concerning equilibrium, the principle of causation, and human accountability towards the environment while examining Newton's Laws. Such interaction enables pupils to comprehend physics ideas while also appreciating the grandeur of God's creation and their responsibilities as stewards on earth (Nasir, 2018).

The execution of Islamic values-based Project-Based Learning (PjBL) corresponds with the national educational objectives and the character education vision articulated by the Ministry of Education and Culture (Tursina & Kamilla, 2025). These objectives underscore the significance of cultivating individuals who are devout, virtuous, erudite, and possess exemplary character (Rizki et al., 2022). Consequently, educational strategies that integrate scientific and spiritual methodologies must be consistently

incorporated into the curriculum and classroom activities (Sutarto, 2017). Moreover, from an Islamic educational standpoint, learning should encompass not only the transmission of information ('ilm) but also the cultivation of spirituality and ethics ('adab). Islamic education is comprehensive and underscores the amalgamation of cognitive, emotive, and psychomotor dimensions into a cohesive entirety (Desfita et al., 2024). This notion corresponds with the philosophy of Project-Based Learning (PjBL), which prioritizes active, reflective, and collaborative learning processes aimed at cultivating intelligent and virtuous individuals (Al-Kamzari & Alias, 2025).

The implementation of Project-Based Learning (PjBL) grounded in Islamic values within physics education fosters a comprehensive and humanistic learning environment, enabling students to acquire knowledge as well as personal development. Through the integration of scientific inquiry and spiritual contemplation, students achieve both a conceptual comprehension of Newton's principles and the internalization of Islamic ideals in their daily practices (Sutiana & Nugraha, 2025). This undoubtedly enhances the cultivation of academically and morally superior student character (Nurpratiwi, 2021). This research is essential for a thorough analysis of how the implementation of the project-based learning model regarding Newton's Laws can effectively foster Islamic character. This study aims to offer theoretical and practical insights into the creation of an integrated, contextual, and transformative physics learning model designed to cultivate a generation with Islamic values in the contemporary day.

2. METHOD

This study utilized a systematic literature review following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology. This methodology was selected to attain a profound and thorough comprehension of the correlation between the implementation of the Project-Based Learning (PjBL) model in physics education, specifically regarding Newton's Laws, and the enhancement of students' Islamic character. PRISMA offers a robust framework for the transparent and methodical search, selection, and synthesis of literature. This systematic literature review seeks to identify, analyze, and synthesize prior research pertinent to the primary focus: the implementation of the project-based learning model in physics education, the instruction of Newton's Laws in secondary education, and the enhancement of Islamic character through scientific learning.

The utilized data sources comprised published scientific articles acquired from multiple electronic databases, including Google Scholar, ScienceDirect, ERIC, DOAJ, Garuda Kemdikbud, ResearchGate, and Scopus, to enhance international relevance. The articles analyzed were published between 2013 and 2024 to guarantee the timeliness and pertinence of the research findings. To ensure the integrity and caliber of the review, specific inclusion criteria were delineated: research articles (excluding opinion pieces, editorials, or popular reviews); examining Project-based Learning (PjBL) within the realm of education, particularly in science or physics education; evaluating Newton's Laws of Learning in secondary education; focusing on dimensions of student character,

especially religious character or Islamic values; and authored in either Indonesian or English, with full-text availability. The exclusion criteria encompassed duplicate papers, articles unrelated to the study's subject, articles lacking proven methodological quality, and articles from questionable or non-peer-reviewed sources. Procedural Steps Using PRISMA. The research procedure followed the four PRISMA steps as follows:

1. Identification

A literature search was conducted using combined keywords such as "Project-Based Learning" and "Physics Education" and "Newton's Laws," "Project-Based Learning" and "Science Learning," and "Islamic Character," "Integration of Islamic Values," and "Physics," and "Religious Character." The search yielded a total of 125 articles from various databases.

2. Screening

After removing duplicates (15 articles) and checking abstract readability and full-text availability, 90 articles remained for further analysis.

3. Eligibility

An eligibility analysis was conducted based on the articles' core content, methodological focus, and thematic relevance. Articles that did not explicitly discuss Project-Based Learning in the context of physics or Islamic character were eliminated. This resulted in 40 eligible articles.

4. Included

Of the 40 articles, 30 primary articles were selected that were most relevant, of good methodological quality, and covered the three focus areas of the study: (1) PjBL, (2) Newton's Laws or intermediate physics, and (3) Islamic values or character. The PRISMA flowchart for the article selection process is shown in Figure 1.

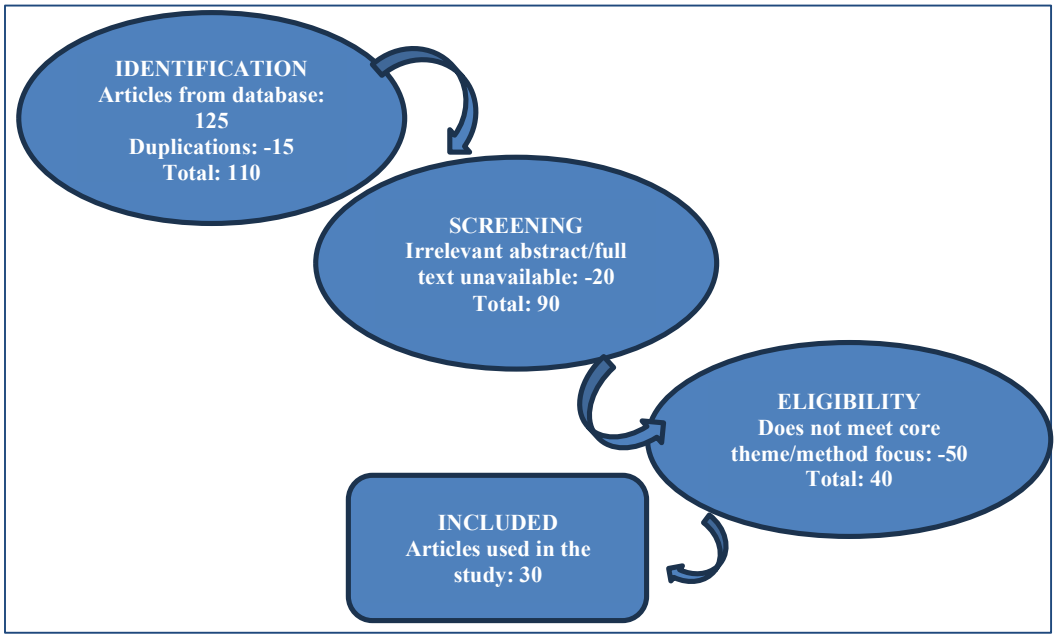

Figure 1. Flowchart PRISMA Model

A qualitative descriptive approach was employed for data analysis, encompassing the following stages: thematic coding of articles (PjBL, Newton's Laws, Islamic character), categorization of research findings into domains of interrelationships, narrative synthesis to elucidate interconnections among studies, and identification of gaps to underscore the necessity of this article's contribution. To ensure the study's validity, we performed source triangulation, cross-referenced literature from several databases, and verified findings from related studies through peer review. The content validity was enhanced by consulting the theoretical framework of Project-based Learning (PjBL), physics education, and Islamic character, as established in source literature.

3. RESULTS AND DISCUSSION

Results

Using the databases Google Scholar, Science Direct (Scopus), ERIC (Education Resources Information Center), DOAJ (Directory of Open Access Journals), Garuda Kemdikbud, and ResearchGate, we were able to review a total of 125 articles. The final articles were used after being categorized based on field clusters during the eligibility stage. We adopted a predetermined flowchart to provide a detailed explanation of all stages of the systematic review.

Identification

The identification process involved the use of Google Scholar, Science Direct (Scopus), ERIC (Education Resources Information Center), DOAJ (Directory of Open Access Journals), Garuda Kemdikbud, and ResearchGate as databases. We used the string "Project-Based Learning in Physics: Learning Materials to Form Students' Islamic Character" in the initial search. Table 1 below displays the search results based on the three sources. A total of 125 articles identified based on "Project-Based Learning in Physics: Learning Materials to Form Students' Islamic Character" were included, which matched the topic.

Table 1. Number of Identified Data

Source	URL	Search result
Google Scholar	https://scholar.google.com/	37
Science Direct (Scopus)	https://www.sciencedirect.com	9
ERIC (Education Resources Information Center)	https://eric.ed.gov/	19
DOAJ (Directory of Open Access Journals)	https://doaj.org/	15
Garuda Kemdikbud	https://garuda.kemdikbud.go.id/	26
ResearchGate	https://www.researchgate.net/search	19
Total		125

Screening

The filtering process is not limited to a single string; it consists of multiple strings. The strings are determined based on the techniques used in data mining, which were discussed previously and are presented in Table 2 below.

Table 2. Search String

Keywords	Search Results
Project-Based Learning in Physics	"Learning Materials to Form Students' Islamic Character"
Association	association
Classification	classification
Clustering	clustering
Outlier	outlier
Prediction	prediction
Regression	regression

Eligibility

We selected 50 suitable articles from the screening results and excluded 40 for the next stage. This process used a total of 30 articles. This process differed from the previous 50 articles because we read the articles in their entirety or in part. The previous figures were obtained solely from the titles. After reviewing the methodology and abstracts of the 50 articles, it became clear that some articles used multiple approaches in their techniques, resulting in duplication in the clustering results. Therefore, a re-evaluation of the abstracts, keywords, and research methodology was necessary. We identified 30 suitable articles.

Included

At this stage, we explored both qualitative and quantitative methods, conducted a thorough review of the articles, and carefully considered data collection methods such as observation, visual analysis, literature review, and interviews. The following points clearly demonstrate this:

Qualitative research is dynamic, meaning it is always open to changes, additions, and replacements during the analysis process. Qualitative methods focus on in-depth observation. Therefore, using qualitative methods in research can produce a more comprehensive study of a phenomenon. Humanism, or the human individual and human behavior, is the focus of qualitative research, which recognizes that the internal aspects of individuals influence all consequences of human actions.

To discover relationships between the variables under study, researchers collect, process, and analyze data sets in quantitative research. The variables used can consist of two or more. Quantitative research uses numerical data and emphasizes the process of measuring objective results using statistical analysis. Quantitative methods aim to collect data sets and make generalizations to explain specific phenomena experienced by a population. In quantitative research, prediction is the most commonly used technique because prediction techniques rely on historical data to predict future data.

From 30 selected scientific articles that were systematically analyzed, three main interrelated focuses emerged:

Effectiveness of PjBL Implementation in Physics Learning

The majority of studies (22 out of 30) indicated that the Project-Based Learning (PjBL) approach significantly enhances students' comprehension of physics concepts. PjBL aids students with conceptualizing abstract principles, such as Newton's laws of motion, by engaging in tangible tasks like creating a toy automobile, a projectile launcher, or a friction simulation. Research conducted by Puspitasari et al. (2020) identified a 23% enhancement in learning outcomes following the implementation of experiment-based Project-based Learning (PjBL) concerning Newton's Laws.

Character Building through PjBL

Eighteen articles indicated that students' active participation in projects enhances character traits such as cooperation, responsibility, honesty, and compassion. Project-based learning promotes collaboration among students, facilitates gradual task completion, and fosters the development of team responsibilities. Research conducted by Rohman et al. (2021) has shown that Project-Based Learning (PjBL) cultivates empathy, discipline, and dedication in students during the project process.

Integration of Islamic Values in Physics Learning

Ten articles explicitly discuss the strengthening of Islamic values through science learning, particularly physics. Integration is achieved through:

1) Inserting relevant Quranic verses, such as Surah Ar-Rahman verses 7-9 concerning the balance of natural law.

2) Spiritual reflection after experiments.

3) Applying the values of honesty and trustworthiness in project implementation.

4) Research by Hayati (2020) found that Quranic-based physics modules improved students' spiritual attitudes and understanding of basic mechanical concepts

Discussion

The findings of this systematic literature review corroborate that the Project-Based Learning (PjBL) model has substantial potential to address the obstacles associated with physics education, particularly in the comprehension of abstract concepts like Newton's Laws. Students not only acquire a more profound understanding of the material through real-world contexts, but they also cultivate their character and social skills during the project process. This model is consistent with the principle of meaningful learning in constructivism theory, which underscores the fact that knowledge is constructed through real-world experiences (Saad & Zainudin, 2024; Sánchez-García & Reyes-de-Cózar, 2025).

Additionally, the integration of Project-Based Learning (PjBL) into Islamic education serves to emphasize the mission of integral education (Rifa'i & Munjiat, 2025), which emphasizes not only knowledge (ilm) but also values and virtuous deeds

(adab). The direct integration of project activities into learning activities can serve as a means of instilling Islamic values. For instance, the instillation of the values of brotherhood (ukhuwah), hard work (jihad), and responsibility as part of a mandate (amanah) can be achieved through a collaborative project to design a basic tool based on Newton's Laws.

The review reveals that there hasn't been a thorough examination of the integration of Islamic values into Project-Based Learning (PjBL). The majority of research continues to differentiate between Islamic character-based learning and project-based learning. Consequently, this article illustrates the importance of creating a PjBL learning framework that explicitly incorporates Islamic values at each stage, from project planning to final reflection.

Research Implications

Based on the results and discussion above, there are several important implications for education:

This study strengthens the relevance of constructivism theory and integrative Islamic education theory in the context of PjBL-based physics learning. This demonstrates that the integration of science and Islamic values is not only possible but also enriches the meaning of learning. Physics teachers can use the PjBL model as a strategic tool to instill Newton's Laws while developing students' Islamic character. Training and the development of teaching materials that systematically support this integration are needed. Furthermore, Schools and policymakers need to encourage the development of curricula and learning modules that focus not only on academic achievement but also on the development of students' character and spiritual values. PjBL can be a primary model for transformative learning in the Independent Curriculum era. Additionally, classroom action research or the development of PjBL-based teaching materials that explicitly integrate Islamic values are needed. This will make a real contribution to the practice of learning and developing Islamic education models that are relevant to the 21st century.

4. CONCLUSION

A systematic literature review conducted using the PRISMA approach of 30 relevant scientific articles concluded that the application of Project-Based Learning (PjBL) in physics instruction, particularly in Newton's Laws, has proven effective in enhancing students' conceptual understanding while simultaneously developing positive character traits. PjBL encourages active, contextual, and collaborative learning, enabling abstract concepts such as force, mass, and acceleration to be more deeply understood through direct experience. Furthermore, the PjBL model also fosters the development of students' Islamic character traits, such as responsibility, cooperation, honesty, trustworthiness, and spiritual awareness. Integrating Islamic values into the physics learning project process can be systematically implemented, from planning to evaluation, by incorporating Quranic values and Islamic educational principles into every stage of the learning process.

As suggestion, these findings confirm that the synergy between constructivist learning models such as PjBL and Islamic values aligns with the holistic nature of Islamic education (kaffah), encompassing cognitive, affective, and spiritual aspects. Therefore, PjBL is not only an innovative learning model from a pedagogical perspective, but also a strategic medium for character education based on Islamic values. Therefore, it is necessary to develop teaching tools, teacher training, and school policies that support the implementation of PjBL integrated with Islamic values. Furthermore, further action-based or developmental research can be conducted to test the effectiveness and practicality of implementing this model on a broader and more contextual scale.

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