Enhancing Contextual Understanding and Critical Thinking in Fiqh Learning through Problem-Based Learning

Feriska Listrianti[1]*, Tutik Hidayah[2], Alma Vorfi Lama[3]
[1,2] Universitas Nurul Jadid Probolinggo, Indonesia
[3] University of Business and Technology, Kosovo, Serbia

Abstract: *This study examines the impact of Problem-Based Learning (PBL) on students' participation, critical thinking skills, and understanding of fiqh concepts. Using a qualitative case study approach, data were collected through in-depth interviews, classroom observations, and document analysis. The findings indicate that PBL fosters a dynamic and inclusive learning environment, encouraging previously passive students to actively engage in discussions, share ideas, and connect fiqh theory to real-life contexts. Teachers observed increased student confidence in questioning, arguing, and problem-solving. These results highlight PBL as an effective alternative for enhancing fiqh education in madrassas and other Islamic institutions. By integrating PBL, students not only improve their conceptual understanding but also develop essential critical and collaborative thinking skills for their future.*

Abstrak: Penelitian ini mengkaji dampak Problem-Based Learning (PBL) terhadap partisipasi siswa, keterampilan berpikir kritis, dan pemahaman konsep fikih. Dengan menggunakan pendekatan studi kasus kualitatif, data dikumpulkan melalui wawancara mendalam, observasi kelas, dan analisis dokumen pembelajaran. Hasil penelitian menunjukkan bahwa PBL menciptakan lingkungan belajar yang dinamis dan inklusif, mendorong siswa yang awalnya pasif menjadi lebih aktif dalam diskusi, berbagi ide, serta menghubungkan teori fikih dengan konteks kehidupan nyata. Guru juga mengamati peningkatan kepercayaan diri siswa dalam bertanya, berargumentasi, dan menyelesaikan masalah. Temuan ini menegaskan bahwa PBL merupakan alternatif efektif untuk meningkatkan pembelajaran fikih di madrasah dan lembaga pendidikan Islam lainnya. Melalui penerapan PBL, siswa tidak hanya meningkatkan pemahaman konseptual mereka, tetapi juga mengembangkan keterampilan berpikir kritis dan kolaboratif yang penting bagi masa depan mereka.

INTRODUCTION

Recently, attention to religious education has been increasing. Especially at the madrasah level, many parties are beginning to realize the importance of equipping students with more than just memorization (Bulut Ates & Aktamis, 2024; Du & Chaaban, 2020; Jiang et al., 2023). It is hoped that students will be able to understand and apply Islamic religious values in their daily lives (Agyapong et al., 2022; Kim, 2024; Wang et al., 2022). However, in reality, conventional learning methods often make students passive. Fiqh learning at MTs Nurul Jadid, for example, tends to be teacher-centered, with students primarily listening and taking notes. As a result, students' understanding does not develop as it should. They memorize the postulates of fiqh, but it isn't easy to see their relevance in real life. Therefore, there is an urgent need to change this approach to something more interactive and relevant. The problem-based learning (PBL) method offers a promising solution, as it challenges students to solve real problems, discuss with friends, and understand Islamic law in depth (Deep et al., 2020; Kopackova et al., 2024; Maftuh, 2023; Yang et al., 2023).

Various studies have shown that Problem-Based Learning (PBL) can significantly transform the teaching and learning process. Research by Chiu (2023) reveals that this approach not only helps students understand theoretical concepts but also creates a more meaningful learning experience. Other related studies indicate that PBL can enhance students' interest in Islamic religious studies (Aslan, 2021; Boelt et al., 2022; Trullàs et al., 2022). By incorporating real-life scenarios, students become more engaged and find it easier to understand the material. Additionally, research suggests that PBL improves critical thinking and collaboration skills, as students learn to discuss, express opinions, and formulate solutions.

Other studies also highlight that implementing PBL in Aqidah Akhlak subjects can enhance students' learning outcomes. Hidajat (2023), Li et al (2022), and Al Ayyubi et al. (2024) found that students who learned through the PBL model demonstrated improved understanding and application of moral values compared to those taught using conventional methods. Additionally, Goshu & Ridwan (2024), Alkandari & Alabdulhadi (2023), and Rahman et al. (2024) found that PBL fosters students' critical thinking and collaborative skills in general subjects integrated with Islamic values.

However, despite these positive findings, research on the application of PBL in Islamic education, particularly in the context of fiqh learning, remains limited. Most existing studies focus on general subjects such as science, mathematics, or secular education, with few exploring how PBL influences students' understanding of fiqh. Furthermore, while studies acknowledge the benefits of PBL in fostering engagement and critical thinking, there is still a lack of in-depth analysis on how it shapes students' ability to apply fiqh principles in real-life decision-making. This study aims to address this gap by investigating how PBL specifically enhances contextual understanding and critical thinking in fiqh learning, providing insights that contribute to more effective pedagogical strategies in Islamic education.

However, the application of PBL in fiqh lessons is still rarely researched. Therefore, this study tries to bridge this gap by investigating the effectiveness of PBL in MTs Nurul Jadid. The main objective of this study is to understand how PBL is applied in fiqh learning at MTs Nurul Jadid and the extent to which this approach can affect student participation and understanding. There are several questions to answer: How do teachers implement PBL in the classroom? What are the challenges they face? And how do students respond to these methods in terms of engagement, critical thinking, and mastery of the material? By answering these questions, this study hopes to provide a clear picture of the implementation of PBL as well as practical recommendations for teachers who want to try this method.

This study assumes that the PBL method not only helps students understand the theory but also trains them to think critically and find the relationship between Islamic law and everyday reality. The hypothesis is that the implementation of PBL in MTs Nurul Jadid will encourage students to be more active in group discussions and more confident in answering given problems. The argument of this research lies in its ability to change the role of teachers into facilitators and students into active participants. That way, the learning process becomes more inclusive and collaborative. The provisional answer from this study is that PBL if applied correctly, can significantly improve students' understanding of fiqh. This also opens up opportunities for students to think critically and find independent solutions to the problems they face, both in the classroom and in daily life.

METHOD

This research was conducted at MTs Nurul Jadid with a focus on grade VII which uses the problem-based learning method (PBL) in fiqh lessons. The unit of analysis includes the dynamics of learning in the classroom, the relationship between teachers and students, and students' responses to the PBL approach. This study uses a qualitative design with a case study approach. This approach was chosen because it allows researchers to dig into first-hand experiences of students and teachers while identifying patterns that emerge during the learning process. In this case, researchers not only look at how PBL is applied but also delve into how this method affects students' engagement and understanding of Islamic law in daily life.

Data for this study were collected from various sources, including fiqh teachers responsible for planning and implementing PBL methods. These grade VII students are learning participants, as well as supporting documents such as Learning Implementation Plans and teaching modules. Teachers provide valuable insights into the strategies they use, the challenges that arise, and the results obtained. Students shared their experiences during group discussions, the process of finding solutions, and the impact of the PBL approach on the way they understood fiqh. In addition, the learning documents provide a more structured picture of how this method is carried out, what materials are used, and the steps taken to achieve the learning objectives. Combining these various sources of information allows researchers to obtain a more complete view of the implementation of PBL in MTs Nurul Jadid.

Data were collected through three main methods: in-depth interviews, classroom observations, and document analysis. Interviews were conducted with teachers and several students to explore their views on the effectiveness of the PBL method, the challenges faced, and the results that have been achieved. Observation in the classroom allows researchers to directly record the interaction between students and teachers, the dynamics of group discussions, and student engagement patterns. Document analysis, such as lesson plans and teaching modules, helps to understand the context, structure, and content of problem-based learning. The tabulation of the informants selected and used in this study is shown in Table 1.

Tabel 1. Coding od Informants

Resource Person Code	Description of Resource Person
I_TG_2023	Class VII fiqh teacher at MTs Nurul Jadid
I_ST_2023	Grade VII students who are active in group discussions
I_FS_2023	A passive but engaged Grade VII student
I_AD_2023	Fiqh assistant teacher in grade VII
I_SD_2023	Grade VII students who asked questions about the postulates.

The data analysis process is carried out in stages. First, the collected data is reduced to filter the most relevant information. Furthermore, the summarized data is presented in the form of a matrix or narrative to facilitate the identification of key patterns. Finally, the data is verified by comparing findings from various sources to ensure the validity and consistency of the research results. With this approach, data analysis becomes more systematic and can provide an in-depth picture of the implementation of PBL in MTs Nurul Jadid.

RESULT AND DISCUSSION

RESULT

Student Participation in Group Discussions

The application of the problem-based learning (PBL) method at MTs Nurul Jadid brought a new atmosphere in the way students participated during group discussions. Observations show that students became more involved in the learning process, especially when they are faced with real problems that are directly related to fiqh material. Classrooms become more lively, filled with active interactions between students and teachers. Group discussions provide a space for students to exchange ideas, share ideas, and find solutions together. Teachers note that this method makes students more comfortable to speak and contribute, although some of them previously tended to be passive.

During learning activities, group discussions prove to be an effective means of exploring new ideas. For example, when students are given a case about ablution procedures in areas with limited water, they immediately divide the task. Some focus on finding evidence from the book of fiqh, while others lead discussions to formulate solutions based on the information they find. Teachers, who act as facilitators, provide open-ended questions that encourage students to think more critically. This activity shows the high enthusiasm of the students. They not only express their opinions, but also actively seek answers to the problems given. The

classroom atmosphere that previously felt monotonous has now changed to be more dynamic and full of energy. From a series of observation activities carried out, it can be observed as shown in Figure 1.
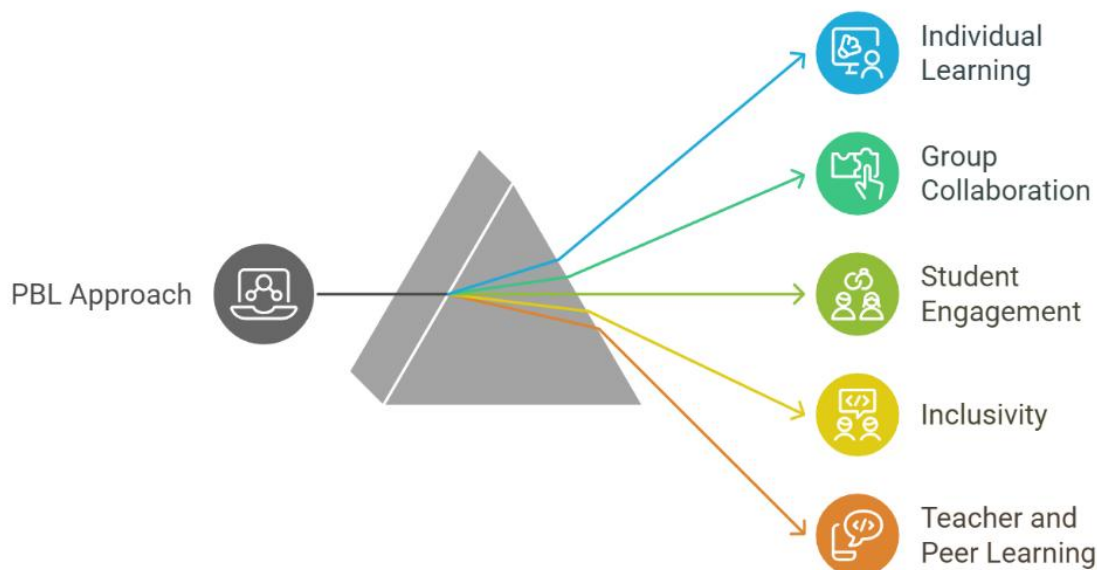

Figure 1. Unpacking the PBL Approach's Impact

From these observations, it is clear that the PBL approach has succeeded in creating more meaningful student engagement. Students not only learn individually, but also work together in groups, share mutual understanding, and deepen their insights through discussions. Teachers observed that students who were normally silent began to show courage to speak up and contribute. By using a problem-based approach, students can learn from teachers as well as their peers, making the learning process more inclusive and collaborative.

In addition, PBL also develops critical and collaborative thinking skills, while strengthening the role of teachers as facilitators who support students in finding solutions independently. This approach further strengthens the view that active and collaborative learning can create a more inclusive classroom atmosphere and support student development in various aspects.

Development of Students' Critical Thinking Skills

Students' critical thinking skills have improved rapidly after the problem-based learning (PBL) method was applied in fiqh learning at MTs Nurul Jadid. Based on the interviews, teachers and students agreed that this approach emphasizes understanding the context more than just memorizing the evidence. One of the teachers explained that students began to show interest in asking questions about the application of Islamic law in certain situations, such as how to perform prayers when the direction of the qibla is difficult to find (I_TG_2023). The interviews also revealed that students looked more confident in discussing and asking critical questions. Teachers noted that students who previously tended to be passive began to show initiative to learn more, either through group discussions or looking for additional references independently (I_ST_2023).

Several statements from teachers and students provide a concrete picture of the positive impact of this method. One of the teachers said, "Students are now more often asked questions that show their understanding of the postulate and how to apply it" (I_TG_2023). A student also shared his experience, "I used to only memorize the postulates, but now I feel more understanding how the postulates are relevant to daily life" (I_ST_2023). Another statement from the students added that PBL makes learning feel more interesting and challenging (I_FS_2023). When discussing the case of water management for ablution, students independently look for solutions by connecting relevant sharia evidence and building logical arguments. Teachers who observe this process note that this method helps students not only understand the material but also think systematically to solve the problem at hand (I_TG_2023). From a series of interviews conducted with several informants, then a thematic analysis was carried out as shown in Table 2.

Table 2. Thematic Analysis

Main Theme	Sub-Theme	Description	Interview/Observation Quotes
Contextual Understanding	Focus on the application of Islamic law	Students begin to understand that Islamic law is not just a theory, but has real applications in everyday life.	"Students are now more often asked questions that show their understanding of the postulate and how to apply it" (I_TG_2023).
Self-Study Initiative	Higher interest in learning	Students who were previously passive began to show initiative to learn more through discussions and the search for additional references independently.	"In the past, I only memorized the postulates, but now I feel more understanding how the postulates are relevant to daily life" (I_ST_2023).
Analytical Capabilities	Real problem analysis	Students are able to analyze real problems, such as water management for ablution in emergency conditions, by connecting sharia postulates and building logical arguments.	Teachers note that students can think systematically to solve the problem at hand (I_TG_2023).
Confidence	More active discussions and debates	Students are more confident to discuss and propose opinions in class, demonstrating analytical and evaluative thinking skills.	"PBL makes learning feel more engaging and challenging" (I_FS_2023).
Troubleshooting	Solving challenges with applicative solutions	Students can seek solutions based on relevant postulates, such as tayamum in an emergency, and understand the relationship between theory and the context of life.	Students succeeded in relating the postulates from the Qur'an to the situation discussed, demonstrating contextual understanding.

Through the interviews and thematic analysis conducted, it is clear that the PBL approach has a positive impact on students' thinking skills. They not only understand fiqh theory but are also able to analyze real problems and formulate solutions based on relevant postulates. In the process, students are more confident to discuss and debate, demonstrating the development of analytical and evaluative thinking skills. A concrete example can be seen when they are asked to find solutions related to tayamum in an emergency. Students successfully relate the postulates from the Qur'an to the situation they are discussing, demonstrating a deep and contextual understanding. PBL also opens up space for them to explore various perspectives, learn new ideas, and practice problem-solving skills in an applied way.

Contextualization of Fiqh Learning in Real Life

The application of the problem-based learning (PBL) method in fiqh subjects at MTs Nurul Jadid is structured based on structured steps that allow students to understand Islamic law in real life. From planning to evaluation, teachers use a problem-based approach that is relevant to the daily experience of students. For example, cases such as determining the direction of the qibla in a remote area or performing ablution when water is limited are part of the learning scenario. These stages are designed to build students' curiosity, encourage them to discuss in groups, and motivate them to investigate and solve the problems they face.

The learning document shows that the PBL process begins with careful planning, including compiling lesson plans based on classical fiqh books, preparing teaching materials, and observation sheets. The implementation of learning is carried out by opening classes, providing motivation, and grouping students. Students are given a discussion sheet to analyze real problems, such as how to carry out tayamum in an emergency. They then searched for the postulates, identified various possible solutions, and discussed them in groups. Each group presented the results of their discussion, which was then evaluated by teachers and peers. With this approach, students not only learn to understand Islamic law but also practice critical and collaborative thinking skills. Where the steps to implement PBL at Mts Nurul Jadid are as explained in table 3.

Table 3. Stages and Implementation Steps

Planning	a. Preparing a Learning Implementation Plan (RPP) according to the book being studied
	b. Preparing teaching materials/materials
	c. Setting up an observation sheet
Implementation	a. Opening lessons, managing classes, checking attendance, praying
	b. Provides encouragement and motivation
	c. Interpreting the book, explaining, and asking questions about the material
	d. Grouping classes into four groups
	e. Providing a discussion sheet in the form of problems
	f. Students investigate or analyze problems critically and are guided by the book
	g. Students determine various considerations of possible Solutions
	h. Group representatives presented the results of the discussion and held a question and answer session

Cover	a. Guiding students to draw conclusions about the material
	b. Providing a close book quiz related to the material that has been studied
	c. Ending with hamdalah and prayer
Evaluation	d. Check quiz results
	e. Conducting a recapitulation of grades

Based on the table of implementation steps, PBL at MTs Nurul Jadid starts from planning, implementation, closing, to evaluation. Each stage is designed to support students to be actively involved in learning. Teachers guide them from problem orientation, encouraging group discussions, to the presentation and evaluation process. The learning document shows that this method has succeeded in improving students' understanding of the concept of fiqh through relevant and applicable activities. Students are invited to connect theory with practice, which helps them understand Islamic law in a more in-depth and contextual.

DISCUSSION

The findings of this study demonstrate that the application of Problem-Based Learning (PBL) in fiqh education at MTs Nurul Jadid is not only pedagogically effective but also epistemologically relevant. Students are no longer confined to rote memorization of postulates; instead, they actively engage in contextual analysis and collaborative exploration of Islamic legal issues. This shift aligns with constructivist learning theory, which emphasizes knowledge construction through authentic experiences and social interaction (Malik & Zhu, 2023; Spaan et al., 2024; von Hausswolff, 2022).

Empirical observations revealed a significant transformation in student participation and critical engagement. For instance, when students were tasked with analyzing issues like ablution in limited water conditions, they demonstrated initiative in dividing tasks, analyzing fiqh sources, and debating practical solutions. These behaviors reflect the central tenets of constructivism and PBL, where learners assume an active role in meaning-making. This supports findings by Damayanti et al. (2024), who emphasized that embedding Islamic values within PBL not only enhances cognitive comprehension but also ethical reasoning and the ability to contextualize religious norms.

Moreover, interview data show that students who were previously passive began to ask analytical questions and seek independent references—indicative of growing *self-directed learning skills*. This resonates with Aljalahma's (2023) view that PBL fosters independent learning while positioning the teacher as a facilitator rather than a knowledge transmitter. Such transformation is further supported by Yu (2024), Wu (2024), and Wijnia et al. (2024), who argue that PBL enhances intrinsic motivation and deeper cognitive engagement, traits clearly reflected in this study's classroom dynamics.

The data also illustrate how students transitioned from merely understanding theory to demonstrating applied jurisprudential reasoning. For instance, discussions on tayamum in emergencies allowed students to connect Qur'anic

postulates to real-world scenarios—a process that showcases not only critical thinking but also epistemological sensitivity to context. This corroborates with findings from Roberson & Perry (2022), Labadze et al. (2023), and Naeem et al. (2023), who assert that active inquiry through contextual learning enhances both retention and relevance.

In addition, the thematic analysis underscores how PBL strengthens metacognitive and analytical competencies. Students were not only able to propose multiple legal alternatives but also justify them through logical arguments and textual evidence. This aligns with Wang et al. (2024) and Shekh-Abed (2025), who highlight the role of PBL in fostering students' metacognitive strategies and enabling them to regulate their learning pathways effectively. The empirical findings also affirm insights from Rohman (2022) and Aljalahma (2023), who documented that PBL in Islamic education can significantly improve students' abilities in ethical reasoning and jurisprudential application.

The novelty of this study lies in its detailed and structured application of PBL within the specific context of fiqh education in an Islamic boarding school setting—a field that has received limited scholarly attention. While many studies focus on PBL in secular or general subjects, this research provides concrete evidence of how such approaches can be adapted to religious education without compromising its theological foundations. By integrating classical fiqh texts with contemporary problem-solving activities, this study bridges traditional Islamic pedagogy with modern educational paradigms, offering a holistic model for religious learning in the 21st century.

These results also align with Lau et al. (2020), who stressed that PBL enhances students' abilities to apply knowledge in real-world contexts, and Usmeldi & Amini (2022), who emphasized the role of direct experience in deepening understanding. Similarly, Malaikosa et al. (2022) affirm that active discussion and collaborative inquiry are vital for developing problem-solving and critical thinking abilities—outcomes clearly observed in the learning activities at MTs Nurul Jadid.

This study thus contributes not only to the growing literature on PBL but also offers a localized and culturally contextualized application of it in Islamic education. The structured stages of implementation—from lesson planning to evaluation—serve as a practical guide for other Islamic institutions seeking to modernize religious instruction without losing its epistemic integrity. As Aseery (2024) noted, contextual learning within religious education fosters deeper personal connections to the subject matter; this study substantiates that claim by showing how students' lived realities are meaningfully woven into the fabric of fiqh learning.

In sum, this research reaffirms that PBL is not merely a pedagogical trend but a transformative approach capable of cultivating *independent, analytical, and reflective Muslim learners*. It demonstrates that when grounded in appropriate frameworks and contextual relevance, PBL can serve as a powerful tool in reimagining Islamic education for contemporary learners.

CONCLUSION

This study confirms that the implementation of Problem-Based Learning (PBL) in fiqh education at MTs Nurul Jadid significantly enhances students' engagement, critical thinking skills, and contextual understanding of Islamic law. The research findings indicate that PBL encourages students to move beyond passive memorization by actively engaging in discussions, analyzing real-life scenarios, and developing logical arguments based on Islamic jurisprudence. Through structured problem-solving activities, students demonstrate improved ability to connect theoretical knowledge with practical applications, making fiqh more relevant to their daily lives.

Additionally, PBL fosters a more dynamic and inclusive classroom environment. Students who were previously hesitant to participate in discussions have become more confident in expressing their thoughts and engaging in collaborative learning. The role of teachers has also shifted from being sole knowledge providers to facilitators who guide students in their exploration of Islamic legal principles. This transformation aligns with the principles of constructivist learning, emphasizing active participation and self-directed inquiry.

Despite these positive outcomes, this study acknowledges certain limitations, including its focus on a single institution and specific fiqh topics. Future research should expand the scope by incorporating diverse educational settings, broader curricular content, and varied student demographics. Exploring the long-term impact of PBL on students' ability to apply fiqh principles in different contexts would further strengthen the validity of these findings.

Overall, this study underscores the effectiveness of PBL as a pedagogical approach that not only enhances students' comprehension of Islamic jurisprudence but also equips them with critical and collaborative thinking skills. The findings provide valuable insights for educators seeking to implement innovative teaching strategies in Islamic education, highlighting the potential of PBL in fostering a more interactive and meaningful learning experience.

ACKNOWLEDGMENT

REFERENCES

Agyapong, B., Obuobi-Donkor, G., Burback, L., & Wei, Y. (2022). Stress, Burnout, Anxiety and Depression among Teachers: A Scoping Review. *International Journal of Environmental Research and Public Health*, *19*(17), 10706. https://doi.org/10.3390/ijerph191710706

Al Ayyubi, I. I., Murharyana, M., Martini, S., Hayati, A., Apriyanti, N. S., & Kamaliya, S. (2024). Meningkatkan Hasil Belajar Siswa pada Mata Pelajaran Aqidah Akhlak Melalui Model Pembelajaran Problem Based Learning. At-Tadris: Journal of Islamic Education, 3(1), 1-14. https://doi.org/10.56672/attadris.v3i1.197

Aljalahma, A. (2023) Cooperative and Problem-Based Learning Practice in Islamic Education in Bahrain: Strengths and Challenges. *Advances in Anthropology*, 13, 279-294. https://doi.org/10.4236/aa.2023.134018

Aljalahma, A. Z. A. (2023). Cooperative and Problem-Based Learning Practice in Islamic Education in Bahrain: Strengths and Challenges. *Advances in Anthropology*, 13(4), 279-294. https://doi.org/10.4236/aa.2023.134018

Alkandari, K., & Alabdulhadi, M. (2023). Promoting Self-Regulation Skills Among Pre-Service Islamic Studies Teachers Through Project-Based Learning Utilizing a Flipped Learning Strategy. *International Journal of Learning, Teaching and Educational Research*, 22(5), 74-100. https://doi.org/10.26803/ijlter.22.5.4

Aseery, A. (2024). Enhancing learners' motivation and engagement in religious education classes at elementary levels. *British Journal of Religious Education*, 46(1), 43-58. https://doi.org/10.1080/01416200.2023.2256487

Aslan, A. (2021). Problem-based learning in live online classes: Learning achievement, problem-solving skill, communication skill, and interaction. *Computers & Education*, *171*, 104237. https://doi.org/10.1016/j.compedu.2021.104237

Boelt, A. M., Kolmos, A., & Holgaard, J. E. (2022). Literature review of students' perceptions of generic competence development in problem-based learning in engineering education. *European Journal of Engineering Education*, *47*(6), 1399–1420. https://doi.org/10.1080/03043797.2022.2074819

Bulut Ates, C., & Aktamis, H. (2024). Investigating the effects of creative educational modules blended with Cognitive Research Trust (CoRT) techniques and Problem Based Learning (PBL) on students' scientific creativity skills and perceptions in science education. *Thinking Skills and Creativity*, *51*, 101471. https://doi.org/10.1016/j.tsc.2024.101471

Chiu, T. K. F. (2023). Student engagement in K-12 online learning amid COVID-19: A qualitative approach from a self-determination theory perspective. *Interactive Learning Environments*, *31*(6), 3326–3339. https://doi.org/10.1080/10494820.2021.1926289

Damayanti, K., Effendi, M., & Daryono, R. W. (2024). The Effectiveness of The Problem-Based Learning Model on Student Learning Achievement in Islamic Education Learning. *IJORER: International Journal of Recent Educational*

Research, 5(5), 1097-1108. https://doi.org/10.46245/ijorer.v5i5.653

Deep, S., Ahmed, A., Suleman, N., Abbas, M. Z., Nazar, U., & Razzaq, H. S. A. (2020). The problem-based learning approach towards developing soft skills: A systematic review. *Qualitative Report*, *25*(11), 4029–4054. https://doi.org/10.46743/2160-3715/2020.4114

Du, X., & Chaaban, Y. (2020). Teachers' Readiness for a Statewide Change to PjBL in Primary Education in Qatar. *Interdisciplinary Journal of Problem-Based Learning*, *14*(1), n1. https://eric.ed.gov/?id=EJ1257960

Goshu, B. S., & Ridwan, M. (2024). Exploring the Role of Project-Based Learning in Fostering Critical Thinking Skills. *Britain International of Linguistics Arts and Education (BIoLAE) Journal*, 6(3), 149-166. https://doi.org/10.33258/biolae.v6i3.1201

Hidajat, F. A. (2023). A comparison between problem-based conventional learning and creative problem-based learning on self-regulation skills: Experimental study. Heliyon, 9(9). https://www.cell.com/heliyon/fulltext/S2405-8440(23)06720-8

Jiang, D., Dahl, B., Chen, J., & Du, X. (2023). Engineering Students' Perception of Learner Agency Development in an Intercultural PBL (Problem- and Project-Based) Team Setting. *IEEE Transactions on Education*, *66*(6), 591–601. https://doi.org/10.1109/TE.2023.3273177

Kim, J. (2024). Leading teachers' perspective on teacher-AI collaboration in education. *Education and Information Technologies*, *29*(7), 8693–8724. https://doi.org/10.1007/s10639-023-12109-5

Kopackova, H., Simonova, S., & Reimannova, I. (2024). Digital transformation leaders wanted: How to prepare students for the ever-changing demands of the labor market. *International Journal of Management Education*, *22*(1), 100943. https://doi.org/10.1016/j.ijme.2024.100943

Labadze, L., Grigolia, M., & Machaidze, L. (2023). Role of AI chatbots in education: systematic literature review. *International Journal of Educational Technology in Higher Education*, *20*(1), 56. https://doi.org/10.1186/s41239-023-00426-1

Lau, J. L., Rahim, N. A. A., Abdullah, S. I. S. S., & Me, R. C. (2020). Factors Affecting Informal Learning Activities of the Millennial Generation. *Ilkogretim Online*, *19*(3), 127–139. https://ilkogretim-online.org/index.php/pub/article/view/7461

Li, T., Wang, W., Li, Z., Wang, H., & Liu, X. (2022). Problem-based or lecture-based learning, old topic in the new field: a meta-analysis on the effects of PBL teaching method in Chinese standardized residency training. BMC Medical Education, 22(1), 221. https://doi.org/10.1186/s12909-022-03254-5

Maftuh, M. S. J. (2023). Understanding Learning Strategies: A Comparison Between Contextual Learning and Problem-Based Learning. *Educazione: Journal of Education and Learning*, *01*(01), 54–65. https://doi.org/10.61987/educazione.v1i1.496

Malaikosa, Y. M. L., Widyadharma, A. P., & Pangestu, W. T. (2022). Curriculum and Learning Management: Integration of Creative Economy Value to Improve Students' Life Skill. *Jurnal Pendidikan Vokasi*, *12*(1), 76–85. https://doi.org/10.21831/jpv.v12i1.44253

Malik, K. M., & Zhu, M. (2023). Do project-based learning, hands-on activities, and flipped teaching enhance student's learning of introductory theoretical computing classes? *Education and Information Technologies*, *28*(3), 3581–3604. https://doi.org/10.1007/s10639-022-11350-8

Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods*, *22*, 1-18. https://doi.org/10.1177/16094069231205789

Nova Fauziah Rahman, Listyono, & Mirtaati Na'ima. (2024). The Influence of Problem Based Learning (PBL) on Critical and Collaborative Thinking Skills in Integrated Biology Learning with Islamic Values. *Al-Alam: Islamic Natural Science Education Journal*, *3*(2), 52–68. https://doi.org/10.33477/al-alam.v3i2.7397

Roberson, Q., & Perry, J. L. (2022). Inclusive Leadership in Thought and Action: A Thematic Analysis. *Group and Organization Management*, *47*(4), 755–778. https://doi.org/10.1177/10596011211013161

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

Shekh-Abed, A. (2025). Metacognitive self-knowledge and cognitive skills in project-based learning of high school electronics students. *European Journal of Engineering Education*, 50(1), 214-229. https://doi.org/10.1080/03043797.2024.2374479

Spaan, W., Oostdam, R., Schuitema, J., & Pijls, M. (2024). Analysing teacher behaviour in synthesizing hands-on and minds-on during practical work. *Research in Science & Technological Education*, *42*(2), 219–236. https://doi.org/10.1080/02635143.2022.2098265

Trullàs, J. C., Blay, C., Sarri, E., & Pujol, R. (2022). Effectiveness of problem-based learning methodology in undergraduate medical education: a scoping review. *BMC Medical Education*, *22*(1), 104. https://doi.org/10.1186/s12909-022-03154-8

Tursynkulova, E., Madiyarov, N., Sultanbek, T., & Duysebayeva, P. (2023). The effect of problem-based learning on cognitive skills in solving geometric construction problems: a case study in Kazakhstan. *Frontiers in Education,* 8(1284305). https://doi.org/10.3389/feduc.2023.1284305

Usmeldi, U., & Amini, R. (2022). Creative Project-based Learning Model to Increase Creativity of Vocational High School Students. *International Journal of Evaluation and Research in Education*, *11*(4), 2155–2164. https://doi.org/10.11591/ijere.v11i4.21214

Von Hausswolff, K. (2022). Practical thinking while learning to program–novices' experiences and hands-on encounters. *Computer Science Education*, *32*(1), 128–152. https://doi.org/10.1080/08993408.2021.1953295

Wang, G., Ren, H., Zhao, G., Gong, S., Du, Y., Xue, Z., Pang, Y., & Zhang, X. (2022). Digital model and giant system coupling technology system of smart coal mine. *Meitan Xuebao/Journal of the China Coal Society*, *47*(1), 61–74. https://doi.org/10.13225/j.cnki.jccs.YG21.1860

Wijnia, L., Noordzij, G., Arends, L. R., Rikers, R. M., & Loyens, S. M. (2024). The effects of problem-based, project-based, and case-based learning on students' motivation: A meta-analysis. *Educational Psychology Review*, 36(1), 29. https://doi.org/10.1007/s10648-024-09864-3

Williamson, E. (2023). The Effectiveness of Project-Based Learning in Developing Critical Thinking Skills among High School Students. *European Journal of Education*, 1(1), 1-11. https://forthworthjournals.org/journals/index.php/EJE/article/view/26

Wu, X. Y. (2024). Unveiling the dynamics of self-regulated learning in project-based learning environments. *Heliyon*, 10(5). https://www.cell.com/heliyon/fulltext/S2405-8440(24)03366-8

Yang, W., Li, H., Su, A., & Ding, L. (2023). Application of problem based learning (PBL) and case based learning (CBL) in the teaching of international classification of diseases encoding. *Scientific Reports*, *13*(1), 15220. https://doi.org/10.1038/s41598-023-42175-1

Yu, H. (2024). Enhancing creative cognition through project-based learning: An in-depth scholarly exploration. *Heliyon*, 10 (6). https://www.cell.com/heliyon/fulltext/S2405-8440(24)03737-X