Problem Based Learning Methods in the Digital Era: Measuring the Impact on Students Learning Motivation and Social Character

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ABSTRACT

This study examines the impact of the Problem-Based Learning (PBL) method on students' learning motivation and social character development within the context of Islamic Religious Education (PAI). Reflecting Nelson Mandela's assertion that education is the most powerful tool to change the world, fostering a supportive learning environment is especially vital in the digital era and the post-Covid-19 period, both of which have significantly affected student motivation and character formation. PBL emerges as a relevant and effective approach to meet these challenges. A mixed-methods design was employed, combining quantitative methods to measure key variables and qualitative methods for deeper insights through interviews and observations. Data collection involved 25 questionnaire items and 6 interview questions administered to educators and students, with a total of 128 survey respondents and 10 interview participants from SMAN 2 Bandung and MAN Cimahi City. Quantitative data were analyzed using descriptive statistics, while qualitative data were processed using Miles and Huberman's framework, including data reduction, data display, and conclusion drawing. The results reveal that PBL positively influences learning motivation and supports the development of four key dimensions of social character: (1) religiosity, (2) worship, (3) responsibility, and (4) tolerance. Notably, SMAN 2 Bandung showed the greatest improvement in tolerance (3.71), whereas MAN Cimahi City excelled in the worship dimension (3.70). Overall, worship and tolerance were the most significantly affected aspects. These findings suggest that integrating PBL into PAI can enhance students' academic engagement and deepen the internalization of religious values. This study contributes empirical evidence that PBL fosters not only cognitive growth but also social and spiritual development, offering practical recommendations for educators and policymakers to create more effective, student-centered PAI learning models in a post-pandemic educational landscape.

Keywords: Problem-Based Learning, Learning Motivation, Social Character

INTRODUCTION

Problem-Based Learning (PBL) is an innovative teaching approach that challenges learners to solve real-world problems (Shimomura & Utsumi, 2025), promoting independent learning and critical thinking skills (Narmaditya et al., 2018; Wijaya et al., 2025) Originating from medical education at McMaster University, the PBL method has been adopted in various disciplines (Alreshidi & Lally, 2024) It usually involves small groups working together to identify learning objectives and develop problem-solving abilities while building scientific knowledge (Anugraheni, 2018) The PBL method emphasizes student-centered learning (Doulougeri et al., 2024) increases motivation and encourages the integration of interdisciplinary knowledge (Youngerman & Culver, 2019) This approach prepares learners for real-world challenges by developing skills essential for 21st-century evidence-based practice

and problem-solving (Burda & Hageman, 2015) Although the PBL method has gained popularity globally, its implementation in some countries, such as India, is still in its infancy, with efforts being made to incorporate it into traditional curricula (Bessa et al., 2017) Meanwhile, countries such as Finland, the Netherlands, and Singapore have been pioneers in integrating PBL methods into school curricula, especially in the fields of science and mathematics. Now the PBL method has become a widely known approach and is used in various educational contexts around the world (Nisa et al., 2023)

In producing maximum learning achievement, it is necessary to have learning motivation that arises from both internal and external sides, so that students can be actively involved in the learning process (Aman, 2016) The motivation to learn has a crucial role (Wijnia et al., 2024; Zhang, 2025) because it is directly related to the interests, efforts, and perseverance of students in following the learning process (Oktiani, 2017) Overall, learning motivation acts as a foundation that supports student engagement and the achievement of academic goals (Xiong, 2025; Yasin et al., 2024) Educators have an important role to play in creating a learning environment that can nurture and increase student motivation, both through providing relevant challenges, constructive feedback, and by building positive relationships between educators and students (Hanaris, 2023) On the other hand, social character also plays an important role in equipping students in behaving (Gosselin et al., 2013) One of the subjects that emphasizes the social character of students is Islamic Religious Education (PAI) (Sofanudin, 2015) this is because in its learning PAI emphasizes moral, ethical, and social values that are very relevant to daily life (Dalimunthe, 2023) PAI not only teaches spiritual aspects and religious rituals, but also forms good attitudes and behaviors in social life including religiosity, worship, responsibility, and tolerance (Junita et al., 2023) It can be seen that these two aspects have their respective roles and functions in the learning process to succeed in the goals of education. Success in learning can be achieved when motivation appears in students, which functions as a driver as well as a guide in the learning process (Emda, 2018) Meanwhile, social character can be said to be a supporter of students' learning motivation (Ji et al., 2021), which plays a role in shaping students into individuals with noble character, morals, toughness, good behavior, and a tolerant attitude (Sakti et al., 2024).

But behind that, the challenge of an educator is not easy, the transition period after the Covid-19 pandemic and the entry of education into the digital era make adrenaline more for an educator (Asadullah, 2024; Hidayah & Feriyansyah, 2023; Hasanah & Smita, 2025; Sari & Putrayasa, 2024; Hatiah & Muslimah; 2024). There are various challenges faced by educators in the learning process in the digital era, such as the gap between educators and students when students are superior in mastering digital technology compared to educators, so that learning styles are incompatible and seem archaic to students (Latif, 2020), this is based on several factors such as generational differences between educators and students, the limitations of educators in mastering technology and the lack of training on technological developments in the digital era (Hartman et al., 2019; Yang & Hsieh, 2024) In addition, the presence of the digital era also has a negative impact on the development of students (Joshi et al., 2025), starting from dependence on technology, especially gadgets, thereby increasing the possibility of cheating, reducing the level of focus during the learning process (Lestari, 2018), causing anti-social, and decreasing students' moral attitudes when they are excessive in using digital technology or gadgets (Fitri, 2017). From this explanation, it can be understood that an educator is faced with challenges as well as moral responsibilities in dealing with moral crises in students, and is required to be able to realize national education goals in order to produce mecaimal learning outcomes (Gimbert et al., 2023).

In this context, the PBL method offers strong relevance. With a focus on solving real problems (Aslan, 2021), the PBL method in PAI learning is able to increase students' motivation to learn and help them develop good social character (Aji & Mediatati, 2021) Through this method, learners are not only encouraged to think critically, but also taught to collaborate, communicate, and be responsible, all of which are essential skills in today's digital society (Ramadhan, 2021) Thus, there is a close relationship between PBL methods, learning motivation, social character, and the digital era. The PBL method plays an important role in increasing students' learning motivation through intellectual challenges that are relevant to the

real world (Hartini, 2017; Prabowo & Jatmiko, 2025; Siregar. 2024) At the same time, the PBL method also contributes to the development of students' social character, allowing them to interact effectively in an all-digital environment (Junita et al., 2023) Integrating PBL methods into the modern education system can be one of the practical solutions in overcoming the challenges of the digital era and ensuring the achievement of national education goals. Thus, identifying and measuring the impact of the use of the Problem-Based Learning (PBL) learning method on students' learning motivation and social character can be used as a concrete step in ensuring that national education goals can be fully achieved. The formulation of the problem raised in this research is how the impact of the use of the Problem-Based Learning (PBL) learning method on the motivation and social character of students. In finding the answer to this question, this study was raised in order to develop practical solutions on how to increase the motivation and social character of students in the digital era.

METHOD

In carrying out research, researchers use a mixed method approach (Onwuegbuzie & Abrams, 2025), which can be simply interpreted as an approach that combines quantitative and qualitative methods (Vebrianto et al., 2020) The role of quantitative methods as an approach involving measurement, calculation, use of formulas, and numerical data for planning, research process, hypothesis formation, data analysis techniques, and conclusion drawing (Strijker et al., 2020) Meanwhile, the role of qualitative methods is to act as an approach that produces descriptive data in the form of written or spoken words from individuals and observed (Rusli, 2021) From the merger of the two methods, it is hoped that it can produce a more thorough exploration of facts, more in-depth answers, freedom of perspective, and more comprehensive and accurate conclusions.

Qualitative data collection was carried out through interviews with subject educators, and several students. Meanwhile, quantitative data collection was carried out by distributing a questionnaire consisting of 25 questionnaire items distributed through Google Form to students to measure the influence of the use of Problem Based Learning learning methods in Islamic Religious Education subjects, especially related to students' learning motivation and social character including religiosity, worship, responsibility and tolerance of students. Details of the respondents' characteristics can be seen in the table below:

Table 1. Table Sampling Characteristic Quantitative

Respondent	Frequency	%
School Origin		
SMA Negeri 2 Bandung	64	50%
MA Negeri Kota Cimahi	64	50%
Total	128	100%
Gender		
Male	41	32%
Famale	87	68%
Total	128	100%
N = 128		

A total of 25 questionnaire items were submitted using a likert scale of 1-5, and 6 question items in the form of interviews were submitted to students and educators as respondents and informants. We do a tiered analysis, we analyze quantitative data using the help of IBM's SPSS application with descriptive analysis and qualitative data you analyze using the Miles and Huberman procedure with data reduction analysis (Thalib, 2022), data presentation and conclusion drawing (Huberman & Miles, 1983) In this study, the researcher proposed a hypothesis involving two aspects, namely learning motivation and social character of students which include religiosity, worship, responsibility, and tolerance. From the researcher's point of view, the use of the Problem-Based Learning method in the learning process of Islamic Religious

3

Education has a positive impact on students, especially on learning motivation and social character. Further explanation can be seen in the diagram below:

Figure 1. Diagram Hypothesis
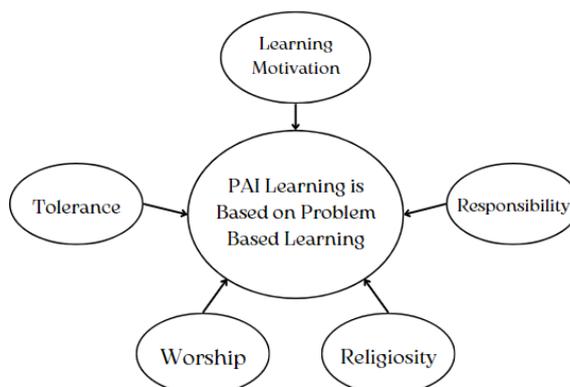
RESULT AND DISCUSSION
1. Quantitative Analysis

Table 2. Reability and Validity

Constructs	items	%	α*
Learning Motivation	I feel more motivated to study Islamic Education (PAI) when using the PBL method in learning.	0,788	0,831
	I am more enthusiastic about learning because the PBL method requires me to think critically.	0,790	
	The PBL method makes me more actively engaged in the PAI learning process.	0,775	
	I find it easier to understand PAI material through the PBL method.	0,811	
	The PBL method helps me better understand the importance of PAI in everyday life.	0,820	
Religiosity	The PBL method in PAI education enhances my understanding of Islamic values.	0,738	0,780
	Learning through the PBL method prompts me to reflect more on Islamic teachings.	0,794	
	I feel more encouraged to practice religious teachings in my daily life after PAI lessons using the PBL method.	0,713	
	PAI learning with the PBL method increases my awareness of the importance of Islamic values.	0,719	
	The PBL method encourages me to better understand the purpose of each act of worship taught in Islam.	0,731	
Worship	The PBL method during PAI learning helps me understand the importance of worship in everyday life.	0,850	0,859
	The PBL method in PAI learning helps me understand the relationship between worship and daily life.	0,835	

		Loading Factor	α*
5	The PBL method during PAI learning encourages me to be more consistent in performing acts of worship.	0,817	
	I feel more motivated to perform acts of worship regularly after participating in PAI lessons using the PBL method.	0,812	
	I believe that the PBL method in PAI learning enhances my awareness of the importance of worship in maintaining a relationship with Allah SWT.	0,830	
Responsibility	The PBL method increases my concern for others.	0,807	0,838
	I feel more responsible towards others after participating in PAI lessons using the PBL method.	0,805	
	I feel more inclined to help others after participating in PAI lessons using the PBL method.	0,806	
	The PBL method enhances my awareness of the importance of contributing to society.	0,788	
	I feel more motivated to engage in social activities that benefit the community after learning PAI with the PBL method.	0,821	
Tolerance	The PBL method helps me appreciate differing opinions among my peers.	0,846	0,862
	I have a greater appreciation for religious diversity after participating in PAI lessons using the PBL method.	0,823	
	I feel that I better understand the importance of tolerance in everyday life after learning with the PBL method.	0,820	
	I am more open to accepting cultural and religious differences after learning PAI with the PBL method.	0,839	
	The PBL method increases my awareness of the importance of living peacefully alongside others.	0,834	

Notes: α* = Cronbach's Alpha

Table 2 shows the reliability and validity of various constructs measured in the study regarding the impact of the use of the Problem Based Learning (PBL) method on Islamic Religious Education (PAI) learning on students' learning motivation and social character. The "Learning Motivation" structure consists of 5 (five) items with loading factors of 0.788, 0.790, 0.775, 0.811 and 0.820, respectively, with a Cronbach's Alpha (α*) value of 0.831 which shows very good internal coexistence. The "Religiosity" construct has 5 (five) items with loading factors of 0.738, 0.794, 0.713, 0.719 and 0.731 respectively with a Cronbach's Alpha (α*) value of 0.780 which shows good internal consistency. The "Worship" construct has 5 (five) items with each factor loadings of 0.850, 0.835, 0.817, 0.812 and 0.830 with a Cronbach's Alpha (α*) value of 0.859 which shows very good internal coexistence. The "Responsibility" construct has 5 (five) with loading factors of 0.807, 0.805, 0.806, 0.788 and 0.821 respectively with Cronbach's Alpha (α*) value of 0.838 which shows very good internal consistency. And the "Tolerance" construct has 5 (five) with loading factors of 0.846,

0.823, 0.820, 0.839 and 0.834 respectively with Cronbach's Alpha (α*) value of 0.862 which shows very good internal consistency. This data shows that each construct has a strong internal consistency, characterized by Cronbach's Alpha values that all exceed 0.7, and some close to 0.9. The loadings factor also showed a strong correlation between the individual items and the constructs being measured, with values above 0.7 indicating good validity. Overall, this data supports that the application of the Problem Based Learning (PBL) method in PAI learning is effective in increasing learning motivation and shaping students' social character, including in the aspects of religiosity, worship, responsibility, and tolerance, with valid and reliable measurements.

The purpose of reliability and validity analysis in SPSS is to ensure that the research instruments used are trustworthy and accurately measure what is being measured. Reliability relates to the internal consistency of items in a construct, which means that measurements made repeatedly under similar conditions will yield consistent results. This is measured by Cronbach's Alpha value, where a value above 0.7 is generally considered sufficient to indicate that the items have high consistency. On the other hand, validity measures the extent to which the items actually represent the construct being studied. To assess validity, a factor analysis is often carried out by examining the loading factor to ensure that the items have a high correlation with the intended construct. Through this analysis, researchers can ensure that the data collected provide reliable and valid results for further interpretation. The benefits of reliability and validity analysis are crucial in scientific research because they ensure the quality and integrity of the data obtained. By using reliable and valid instruments, researchers can be more confident that the results of the study truly reflect the reality being studied, and are not simply caused by the weakness of the instrument. In addition, ensuring that the research instruments have high reliability and validity helps to build a solid foundation for further research as well as provide more credible recommendations to practitioners and policymakers based on the findings of the research.

Table 3. Descriptive Statistic

Constructs	Items	N	Min	Max	Mean	Std. Deviation
Learning Motivation	I feel more motivated to study Islamic Education (PAI) when using the PBL method in learning.	128	1	5	3,36	0,684
	I am more enthusiastic about learning because the PBL method requires me to think critically.	128	1	5	3,59	0,779
	The PBL method makes me more actively engaged in the PAI learning process.	128	1	5	3,55	0,730
	I find it easier to understand PAI material through the PBL method.	128	1	5	3,45	0,697
	The PBL method helps me better understand the importance of PAI in everyday life.	128	2	5	3,82	0,736
Religiosity	The PBL method in PAI education enhances my understanding of Islamic values.	128	2	5	3,70	0,682
	Learning through the PBL method prompts me to reflect more on Islamic teachings.	128	1	5	3,47	0,783
	I feel more encouraged to practice religious teachings in my daily life after PAI lessons using the PBL method.	128	1	5	3,59	0,693

		N	Min	Max	Mean	Std.
	PAI learning with the PBL method increases my awareness of the importance of Islamic values.	128	2	5	3,84	0,718
	The PBL method encourages me to better understand the purpose of each act of worship taught in Islam.	128	2	5	3,72	0,687
Worship	The PBL method during PAI learning helps me understand the importance of worship in everyday life.	128	2	5	3,82	0,645
	The PBL method in PAI learning helps me understand the relationship between worship and daily life.	128	2	5	3,69	0,612
	The PBL method during PAI learning encourages me to be more consistent in performing acts of worship.	128	1	5	3,58	0,749
	I feel more motivated to perform acts of worship regularly after participating in PAI lessons using the PBL method.	128	1	5	3,58	0,659
	I believe that the PBL method in PAI learning enhances my awareness of the importance of worship in maintaining a relationship with Allah SWT.	128	1	5	3,77	0,745
Responsibility	The PBL method increases my concern for others.	128	2	5	3,63	0,708
	I feel more responsible towards others after participating in PAI lessons using the PBL method.	128	2	5	3,48	0,627
	I feel more inclined to help others after participating in PAI lessons using the PBL method.	128	2	5	3,52	0,652
	The PBL method enhances my awareness of the importance of contributing to society.	128	1	5	3,53	0,639
	I feel more motivated to engage in social activities that benefit the community after learning PAI with the PBL method.	128	2	5	3,44	0,673
Tolerance	The PBL method helps me appreciate differing opinions among my peers.	128	2	5	3,71	0,654
	I have a greater appreciation for religious diversity after participating in PAI lessons using the PBL method.	128	2	5	3,63	0,640
	I feel that I better understand the importance of tolerance in everyday life after learning with the PBL method.	128	1	5	3,67	0,722
	I am more open to accepting cultural and religious differences after learning PAI with the PBL method.	128	2	5	3,60	0,632

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The PBL method increases my awareness of the importance of living peacefully alongside others.	128	2	5	3,80	0,668
Valid N (listwise)	128				

Table 3 presents descriptive statistics for various constructs measured in the study on the impact of the Problem Based Learning (PBL) method on students. Each construct consists of 5 items with a total of 128 respondents. For the Learning Motivation construct, the mean value ranges from 3.36 to 3.82 with a standard deviation between 0.684 to 0.779, which shows the positive perception of students towards PBL-based PAI learning in increasing learning motivation. The Religiosity Construct has a mean value between 3.47 to 3.82 with a standard deviation of 0.682 to 0.783, which indicates a positive perception of increasing religiosity through PBL-based PAI learning. In the Worship construct, the average score was between 3.58 to 3.83 with a standard deviation between 0.612 and 0.749, showing students' positive perception of improving the aspect of worship through the PBL method in PAI learning. For the Responsibility construct, the mean value ranges from 3.44 to 3.63 with a standard deviation of 0.627 to 0.708, which also reflects a positive perception related to increased sense of responsibility. Meanwhile, in the Tolerance construct, the mean value is between 3.60 to 3.80 with a standard deviation of 0.632 to 0.722, indicating a positive perception of students towards increasing tolerance through PBL in PAI learning. Overall, this data indicates that the use of the Problem Based Learning method in PAI learning has a positive impact on improving students' motivation and social character, including religiosity, worship, responsibility, and tolerance.

Table 4. Average per-School

Category	MAN Kota Cimahi	SMAN 2 Bandung	Overall
Learning Motivation	3,52	3,59	3,55
Religiosity	3,68	3,64	3,66
Worship	3,70	3,68	3,69
Responsibility	3,51	3,53	3,52
Tolerance	3,66	3,71	3,68
Total	3,61	3,63	3,62

This table shows the mean for various categories related to the impact of the use of the Problem Based Learning (PBL) method in two schools: MA Negeri Kota Cimahi and SMA Negeri 2 Bandung. Overall, SMA Negeri 2 Bandung had the highest average score in almost all categories, with the highest score in the "Tolerance" aspect (3.71). This shows that students at SMA Negeri 2 Bandung feel the most positive impact of the application of the Problem Based Learning method in Islamic Religious Education (PAI) learning, especially in terms of tolerance. On the other hand, the State MA of Cimahi City tends to have the highest average score in the "Worship" category (3.70), which indicates that students at the State MA of Cimahi City feel the most positive impact of the use of the PBL method in the context of worship. This data shows that although there is variation between the two schools, the use of Problem Based Learning (PBL) methods in general has a positive impact on various aspects, including learning motivation, religiosity, worship, responsibility, and student tolerance, with some schools feeling a more significant impact with the highest positive impact in the "Worship" category (3.69). We include a visualization of the average of each school in the form of a graph below

8

Figure 2. Average Analysis per-School
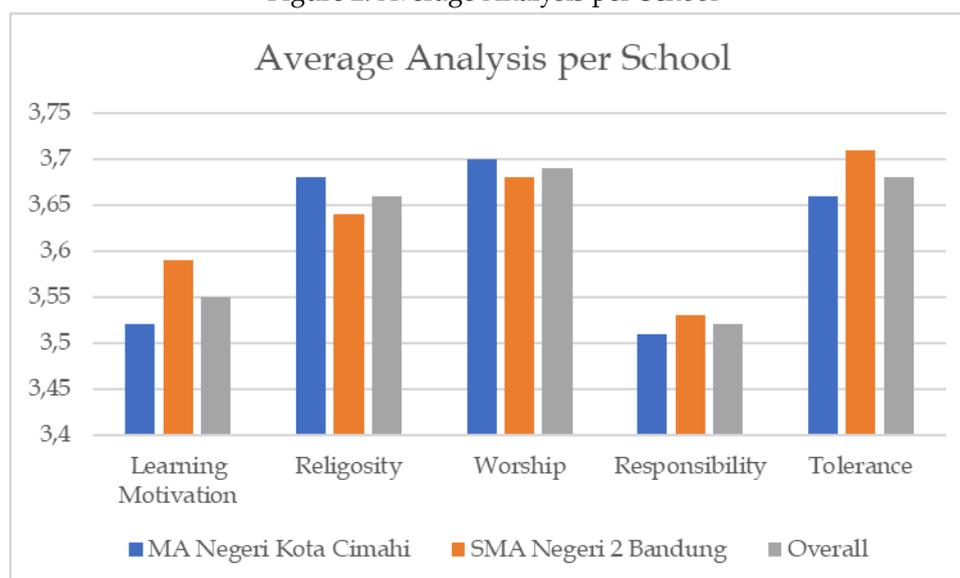
2. Qualitative Analysis

The Problem Based Learning (PBL) method has been proven to have a positive impact on students' learning motivation, especially in PAI subjects. In interviews, students revealed that PBL encourages them to be more active in seeking information and understanding the material. One of the students, stated that this method makes him more motivated to learn because he is faced with a real situation or problem, which requires him to think critically. This makes the learning process less monotonous and more dynamic, so that students feel emotionally involved in learning. In addition, PBL teaches students to be more independent in learning. By directing students to search for information independently, they can explore various sources relevant to the material. Students said that this method makes them more creative and is not bound to the educator's explanation alone. This fun and more interactive learning process contributes to increased learning motivation, where students feel more excited and have a high curiosity about the material being studied. Educators who teach PAI subjects also noted the positive impact of PBL on student motivation. They stated that with PBL, learning becomes not boring. This method allows learners to work in groups, which increases their enthusiasm. In addition, the use of parables in teaching creates relevant context and inspires learners to think more critically, thereby increasing their motivation to learn.

In addition, the implementation of PBL in the classroom also has a positive impact on the activeness of students. Students feel that they are given the space to actively participate in the teaching and learning process. Some learners reported that when they were given a case or problem to analyze, they were more involved in the discussion. Students are not only passive listeners, but they actively ask questions and share opinions in groups. PBL also creates an interactive learning atmosphere. One of the students emphasized that this method allows them to express their opinions more freely without feeling pressured, thus fostering their confidence. In addition, students revealed that with more question and answer sessions, they felt more cared for and heard. This increases their desire to contribute to class discussions. Educators who teach PAI subjects also confirmed the increase in student activity. They explained that in the implementation of PBL, students actively ask and answer questions and interact with teaching materials. This method also provides opportunities for students to socialize and respect peer opinions. This positive learning atmosphere allows students to feel more comfortable sharing ideas and expressing opinions, thereby creating a more inclusive learning environment.

Not only motivation and activeness, the use of PBL also has a positive impact on students' understanding of religious values. Students feel that by using PBL, they can understand the teaching material more deeply. One of the students stated that this method

makes it easier to relate religious concepts to real-life situations, so that their understanding of religious values is richer and more contextual. Students also revealed that with the PBL approach, they can discuss religious values in a broader context. Through case analysis, students are invited to reflect and understand the application of these values in daily life. This method makes learning not only focus on theory, but also on practical application, so that students feel more able to integrate religious values in their behavior. Educators of PAI subjects also noted that PBL encourages students to think critically about religious values. They stated that when students are faced with relevant cases, they are better able to draw conclusions and understand the essence of these religious values. This shows that PBL not only educates students academically but also shapes their character and morality, which is an important aspect of religious education. Overall, the results of interviews with students and educators of PAI subjects from MAN Cimahi City and SMA Negeri 2 Bandung show that the Problem Based Learning (PBL) method has a significant positive impact in increasing students' motivation, activeness, and understanding of Islamic Religious Education (PAI) subjects. PBL not only makes learning more interactive and fun, but also helps students in relating the material to their daily lives, thus creating a meaningful and applicable learning experience.

The scientists' views on the factors that increase learning motivation identify several key elements. First, intrinsic and extrinsic motivation play an important role (Berkovich & Hassan, 2023; Nurishlah et al., 2023). Intrinsic motivation comes from internal factors, such as interest, pleasure, and personal satisfaction in learning (Nguyen-Viet & Nguyen-Viet, 2025; Ummat et al., 2024) In contrast, extrinsic motivation involves external factors such as grades, praise, and other forms of recognition (Cahyono et al., 2022; Wesenberg et al., 2025) In addition, the concept of expectations and values is also very important. The expectation of success and the value given to success play a big role in motivating students (Meyer et al., 2019) When learners see a clear connection between the activities they do and their goals, their motivation tends to increase. The value of achievement, or the importance of a task for students, also greatly affects their motivation and learning outcomes. Finally, self-regulation and self-efficacy (belief in one's own abilities) are important factors in maintaining motivation (Kusumawati, 2018) These two factors help learners manage their learning process and survive challenges.

Problem-Based Learning (PBL) has been proven to be able to influence the development of students' social character in various educational contexts. Research shows that PBL can improve various student characteristics, such as discipline, curiosity, communication skills, and the ability to work together. Students who are taught with the PBL method generally show better character development than students who are taught with traditional methods. In addition, PBL also encourages the development of social skills by facilitating collaborative learning and social interaction, where learners learn to make decisions in groups, actively listen, and share emotions. Not only improving social skills, PBL also promotes students' independence and confidence. Through this approach, students are invited to be more independent in the learning process and be able to rely on themselves in solving the problems they face. PBL also plays an important role in improving social and academic integration among students, which has a positive impact on learning progress and formal social interaction. Thus, PBL contributes significantly in forming a stronger and integrated social character among students.

DISSCUSSION

The findings of this study reveal that the implementation of the *Problem-Based Learning* (PBL) method in Islamic Religious Education (PAI) has a significant positive impact on students learning motivation and the development of their social-religious character. Specifically, there was an increase in four character aspects: religiosity, worship, responsibility, and tolerance. These results were derived from a quantitative analysis of 128 respondents, which showed high average scores across all indicators using a Likert scale. These findings were further supported by qualitative data from interviews with students and teachers, indicating heightened enthusiasm, active engagement, and students' ability to relate PAI materials to real-life contexts.

PBL was found to foster a contextual, enjoyable, and emotionally engaging learning environment, encouraging students' active involvement while reinforcing spiritual and social values.

This study demonstrates that the implementation of Problem-Based Learning (PBL) in Islamic Religious Education (PAI) not only enhances students' learning motivation but also significantly shapes their socio-religious character, particularly in the aspects of religiosity, worship, responsibility, and tolerance. This distinguishes the present research from previous studies, which predominantly focused on cognitive aspects such as academic achievement or critical thinking skills, without explicitly exploring the formation of religious values and character. For instance, (Rohman, 2022; Maryani et al., 2023; Laili et al., 2023) highlighted the effectiveness of PBL in enhancing religious problem-solving skills in pesantren education through the bahth al-masa'il method. However, this study did not further examine its impact on students' social character dimensions such as tolerance or responsssibility. (Pransiska et al., 2024) emphasized that PBL can develop students' critical thinking abilities in PAI learning but did not specifically investigate the transformation of spiritual values or worship practices. (Firdaus et al., 2024; Putri et al., 2025) underlined the impact of PBL on the development of moderate attitudes among university students in Islamic higher education. Although ssocially relevant, the study did not explicitly address aspects of religiosity and worship as this study does. Similarly, (Qomar & Fitri, 2024) focused on innovative learning strategies under the Merdeka Belajar curriculum, including PBL, but still emphasized general cognitive and affective development without detailed discussion of socio-religious character formation. The study by (Damayanti et al., 2024) confirmed that PBL could enhance academic achievement in PAI at the junior secondary level. However, it did not investigate how PBL contributes to the internalization of religious values. (Aditomo & Klieme, 2020) affirmed PBL's effectiveness in improving learning outcomes and critical thinking in science education but did not explore its relationship to Islamic values or character development.

From a broader perspective, (Alreshidi & Lally, 2024) focused on teacher training for PBL implementation and its effect on student outcomes. This study emphasized pedagogical intervention without investigating the integration of spiritual values in the learning process. (Yu & Zin, 2023) conducted a systematic review of PBL adaptations oriented toward critical thinking, but their focus was limited to model design rather than its impact on character education. Similarly, (Wijnia et al., 2024) in their meta-analysis assessed the effects of PBL, Project-Based Learning (PjBL), and Case-Based Learning (CBL) on student motivation without addressing spiritual or religious character aspects. (Trullàs et al., 2022) concluded that PBL is effective in medical education, especially in developing students' clinical and academic competencies. However, the discipline and learning objectives differ significantly from the socio-religious and character-based learning examined in the present study.

Therefore, this study offers an original and significant contribution by explicitly exploring how PBL in Islamic Religious Education can foster students' socio-religious character. Its focus on religiosity, worship, responsibility, and tolerance expands the scope of previous literature—mostly limited to cognitive domains—and provides practical recommendations for Islamic educators to design character-based learning that is contextual and transformative in the post-pandemic era.

This research offers meaningful practical implications for PAI teachers, school leaders, and education policymakers—particularly in designing 21st-century learning that emphasizes not only cognitive skills but also character development. For PAI educators, PBL serves as an innovative strategy to present Islamic values in a more applicable and relevant way to students' daily lives. This approach promotes interactive, collaborative, and reflective learning that encourages critical thinking and the internalization of religious values. From a policy perspective, the findings underscore the need for intensive teacher training programs in designing context-based PBL lessons for PAI. Teachers should be equipped not only with technical skills in planning PBL scenarios but also with strategies to embed character values such as tolerance, responsibility, and worship into problem-solving processes. This can strengthen the role of Islamic Religious Education as a strategic means to foster national character amidst digital-era and post-pandemic challenges.

The several limitations in this study should be acknowledged. First, the research was conducted in only two high schools located in Bandung and Cimahi, which limits the generalizability of the findings. Future research should include comparative studies across different regions and educational levels to enhance representativeness. Second, the study was confined to the subject of Islamic Religious Education. Yet, PBL could be applied across various subjects to examine its impact on other character dimensions. Future studies are encouraged to explore interdisciplinary applications of PBL to assess its effects on empathy, leadership, honesty, and integrity. Third, the mixed-method approach employed in this study remains descriptive and does not incorporate inferential statistical analyses such as regression, correlation, or group comparisons that could provide stronger quantitative evidence. Therefore, future research should consider using inferential statistics and longitudinal designs to evaluate the long-term impact of PBL on character development. Fourth, although PBL has proven effective in this study, further exploration is needed on how digital technologies can be optimally integrated into PBL scenarios. Developing technology-based PBL platforms could offer innovative pathways for character education in the digital age.

CONCLUSION

Based on data analysis from various tables, it can be concluded that the use of the Problem Based Learning (PBL) learning method has a significant positive impact on students' motivation and various aspects of social character. The mean values for constructs such as learning motivation, religiosity, worship, responsibility, and tolerance as a whole showed quite high results, with the highest score in the "Worship" category (3.69) and the lowest in the "Responsibility" category (3.52). This indicates that the use of the Problem Based Learning method in PAI learning has a positive impact on increasing learning motivation and social character for students in positive behavior. As for the analysis per school, there is a different impact when Problem Based Learning is used in the learning process, especially in PAI subjects. SMA Negeri 2 Bandung has the highest average score in almost all categories, with the highest score in the aspect of "Tolerance" (3.71), while MA Negeri Kota Cimahi tends to have a lower score. Nonetheless, each school showed a significant improvement in the various aspects measured. As for the support based on informant data at the research location, it was found that the use of the Problem Based Learning (PBL) method has proven to be effective in increasing students' motivation, activeness, and understanding in Islamic Religious Education (PAI) subjects. PBL encourages students to be more active and independent in learning, improving their creativity and critical thinking skills. In addition, PBL creates an interactive and inclusive learning atmosphere, where students are more engaged in discussions and feel motivated to contribute. Their understanding of religious values also becomes deeper and more contextual through the application of PBL in learning. Thus, it is emphasized that the use of the Problem Based Learning (PBL) method has a positive impact in supporting the development of learning motivation and social character of students. Thus, it can be concluded that the Problem Based Learning method in PAI learning is effective in increasing learning motivation and social character of students, and can be a good choice to support the development of both.

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13

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15

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