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Literatur Analisis on the Utilization of PAI Learning Media Applications: A Study of Opportunities and Challenges in Secondary Schools

Velly Sanzi[1], Muh. Alif Kurniawan[2]
[1,2]Universitas Ahmad Dahlan, Indonesia

[1]velly2100031137@webmail.uad.ac.id

Abstract

The advancement of technology has significantly influenced Islamic Religious Education (PAI) learning. This study aims to analyze the opportunities, challenges, and strategies for utilizing digital learning media applications in secondary schools. Using a literature review approach, this research highlights the potential of learning media to enhance interactivity, participation, and comprehension through engaging and flexible methods. However, challenges such as limited technological infrastructure, low digital literacy among educators and students, and resistance to new teaching methods hinder optimal implementation. Proposed strategies include intensive teacher training, improved infrastructure, relevant content development, and the integration of Islamic values with technology. By addressing these challenges, the use of technology in PAI can foster more effective and innovative learning experiences aligned with the needs of the digital era.
Keywords: Islamic Religious Education, learning media applications, opportunities, Challenges, Strategies.

Introduction

The advancement of digital technology has brought significant changes in the world of education. Technology and media that continue to develop have an important role in learning, including in PAI learning (Jannah & Jannah, 2024). The rapid development of digital technology in the era of the Industrial Revolution 4.0 and its impact on the world of education, including PAI, the need for the integration of digital technology can increase the effectiveness and efficiency of PAI learning, digital technology can increase the accessibility of materials, interactive learning, and make the learning process more interesting through interactive media such as *e-learning* and mobile applications (Rm, 2024).

As according to Basyirah, Musadad and Muchtarom in a journal said the incorporation of technology into education has become essential in the digital age. Utilizing interactive learning media has proven to be an effective approach to enhancing the quality of education, particularly in the teaching of Islamic studies for vocational high school students, The point is that integration in education has become an important need in the digital era. The use of interactive learning media has proven to be an effective approach to improve the quality of education, especially in teaching Islamic studies for vocational high school students (Musadad, 2025).

However, the use of digital technology in PAI learning also faces various challenges, such as limited technological infrastructure, especially in remote areas, which is a significant obstacle when implementing online learning, the lack of digital literacy among teachers and students is also one of the obstacles in using technology in education Badrul Arifin, "PAI Learning Innovation in the Hybrid Learning Era: Opportunities and Challenges," 2021.. In addition, the use of innovative learning media such as videos and mobile applications in PAI learning has the potential to improve students' understanding of rather complicated materials. However, their

implementation is often limited and is only used as an add-on, not as a primary method. Teachers tend to be more comfortable using the lecture method, while video media is more often considered a tool (Abdurrahmansyah, Abdurrahmansyah, Mustopa, 2024).

According to Mostopa et al., solutions to overcome the challenges of using technology in PAI learning include intensive training for teachers, improving technological infrastructure in schools, and implementing interactive learning methods based on digital media that are designed in a structured and evaluative manner (Abdurrahmansyah, Mustopa 2024). Therefore, this study aims to analyze the opportunities and challenges of technology in PAI learning, as well as identify strategies in optimizing its use.

Method

This study uses a literature analysis approach with selection criteria based on topic relevance, publication time span (2018–2023), and the credibility of sources such as reputable journals. The analysis process involves collecting literature from scientific databases, sorting by main themes (opportunities, challenges, strategies), and comparative analysis to identify new patterns and innovations in the application of technology in PAI learning. With this method, this study aims to provide comprehensive insight into the optimal strategy in the use of learning media applications to improve the quality of PAI education in the digital era. In general, the literature serves to find the findings of previous research related to a specific phenomenon or situation to be studied (Afiyanti, 2014).

Here is a flowchart that illustrates the literature analysis process based on the steps you mentioned in the research method.

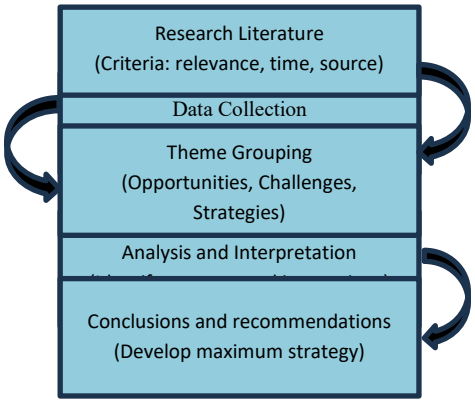


Figure 1. Literature Analysis Process Flow Diagram

Results

This section is the main part of the article. This is where the author/s should explain in words what he/she discovered in the research.

1. Opportunities for the Utilization of Learning Media Applications in PAI
   a). Increasing Interactivity and Participation of Students

The interactive learning approach is one of the methods that can be applied by teachers in the teaching process (Muslih Hafid, 2024). According to Jannah et al in an article, the use of application-based interactive learning media can increase student participation and learning outcomes. For example, the development of android-based interactive learning media has been proven to be effective in increasing student participation and learning outcomes in PAI subjects (Jannah & Jannah, 2024).

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Research by Khima in his research states that the interactive approach in Islamic Religious Education (PAI) learning not only contributes to improving students' critical and creative thinking skills, but also equips them with adaptive and innovative skills to face future challenges. The application of interactive methods in PAI has been proven to be effective in developing critical thinking skills and creativity. Through the use of problem-solving-based interactive learning models, educators can create a more dynamic learning atmosphere that is in accordance with student needs (Khima, 2024).

The research by Waty in his research explained to test the effectiveness of learning methods, students' speaking skills through the use of interactive PowerPoint media. The results of this study showed that there was a significant improvement in students' speaking skills, with an increase of 45.98% in the pre-trial stage and experimental stage I, and 43.33% in the cycle II stage. Another relevant research, which developed a web-based Islamic Religious Education learning media, the results of which showed that the media was valid and feasible to be tested in the learning process (Waty, 2023).

b). Accessibility of Learning Materials

Accessibility is a technology that can expand access to learning materials, allowing students to access them anytime and anywhere through devices such as computers, tablets, or mobile phones. This supports more flexible and personalized distance learning (Avina, 2023).

According to Heorudin et al, E-learning has transformed the conventional approach to education. In the past, learning was confined to classrooms with textbooks as the primary resource. Now, with e-learning, education is no longer restricted by physical spaces. Learning materials are accessible anytime, anywhere, and to anyone with an internet connection. The point is that E-learning has changed the conventional approach in education. In the past, learning was limited to the classroom with textbooks as the main source. Now, with e-learning, education is no longer limited by physical space. Learning materials can be accessed anytime, anywhere, and by anyone with an internet connection. (Hoerudin et al., 2023).

According to (Rohmatun City, Nasr M, 2024), the integration of media and technology in Islamic Religious Education (PAI) learning provides various important benefits. This includes increased interaction between teachers and students which makes learning more engaging and interactive. In addition, easy access to quality information and materials allows students to repeat and understand lessons better. The use of technology also enriches the variety of material presentation, which contributes to improved student understanding. In addition, this integration supports the effectiveness and efficiency of learning, so that student learning outcomes can be more optimal.

c). Variation of Learning Methods

Learning media applications provide various methods in delivering material, as explained by jannah in her article The use of interactive media has been proven to increase student engagement, enjoyment, and interest in learning, in addition, media such as videos, animations, and simulations provide simpler explanations for complex subject topics, so that students can understand the material better (Jannah & Jannah, 2024).

2. Challenges in the Utilization of PAI Learning Media Applications

a). Limitations of Technological Infrastructure

Limited technological infrastructure is a situation where access to adequate hardware and internet connections is still minimal or unavailable. The challenges of applying digital technology in Islamic education include limited infrastructure, low accessibility, and difficulties in integrating Islamic values with technology, in addition to the limited access to the internet and technology in some remote areas can also hinder the implementation of digital learning applications (Khasanah, 2024).

In fact, internet infrastructure and information technology have a role that can support the digital transformation process in education in Indonesia, such as in 2023, there is a significant gap between urban and rural areas in Indonesia, 82.2% of students in urban areas have internet access while in rural areas only 70.56% of students have internet access (Digitaltranformation.co.id, 2024). This gap shows that students in rural areas have limited internet access in using digital technology in learning.

According to Isti'ana's research, the implementation of technology in Islamic education faces a number of challenges, one of which is the limited technological infrastructure in various regions, especially in developing countries. In addition, many teachers still lack inadequate skills to utilize technology in the learning process. Another significant obstacle is cultural resistance to change, which often hinders the application of technology in Islamic educational institutions (Isti'ana, 2024). Therefore, it is necessary to ensure the readiness of teachers in using technology in learning.

In addition, according to Munir and Su'ada, the use of technology in Islamic education faces challenges such as limited infrastructure, lack of technology skills among educators, and a rigid organizational culture is also one of the obstacles in the application of technology. In remote areas, minimal access to technology is the main obstacle, so strategies are needed to encourage cultural change and increase technological adaptation (Munir & Zumrotus Su'ada, 2024).

b). Lack of Digital Competency for Teachers and Teachers

The lack of digital literacy among teachers and students is one of the obstacles in using technology in education. because many PAI teachers are not skilled in utilizing technology as a learning aid. This reduces the effectiveness and interactivity of teaching, making it monotonous and suboptimal. In addition, the uncontrolled use of technology risks opening up opportunities for misuse of information or content deviations that are contrary to religious teachings. Therefore, strict policies are needed to reduce these risks (Rm, 2024).

c). Reconciliation Towards Changes in Learning Methods

Resistance to changes in learning methods is the tendency to reject, maintain old ways, or feel reluctant to accept new learning methods. Changes in the education system often encounter obstacles in the form of resistance from various parties involved, such as teachers, administrative staff, parents, and students. Therefore, stakeholders in the education sector need to understand the right strategies to effectively address these challenges (Hayadi et al., 2024).

Teachers and the community tend to be more comfortable using conventional learning methods, such as lectures, because they are considered more effective in conveying religious values. Example: Digital learning media is often only used as an add-on, not as the main method, because it is considered less rooted in the principles of religious learning. According to Abdullah, in his research, the use of digital media is very effective in increasing students' learning motivation in learning Al-Islam Kemuhammadiyahan at SMP Unismuh Makassar. Media such as Smart TV, radio, and other learning videos can increase students' enthusiasm and interest in learning (Abdullah, 2023).

Several other studies also explain that the use of digital media can increase students' enthusiasm and skills in teaching techniques of PAI teachers. Digital media integration allows for effective and flexible delivery of material (Nurqozin & Putra, 2023).

3. Strategy for Optimizing the Utilization of PAI Learning Media Applications

a). Intensive Training for Teachers

Intensive training for teachers is a program designed to develop teachers' abilities and expertise in the teaching process. For example, attending seminars and supporting training for teachers can bring changes to the learning systems and methods applied to students. In addition

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to improving skills and abilities that have not been mastered before, teachers can also further explore their potential to develop further in understanding the outside world (Santoso, 2022).

According to Fadillah, in his research, teacher competencies that need to be improved include language skills, such as listening, speaking, reading, and writing. In addition, teachers also need to develop the ability to create innovative teaching methods, design effective learning media, prepare a good learning implementation plan (RPP), deliver material that is in accordance with the student's academic level, and provide learning motivation to students (Roojil, 2021).

b). Technological Infrastructure Improvement

The development of technological infrastructure is an effort to improve quality and expand the scope of information technology (IT). IT infrastructure is the basis of technology that supports all digital activities in a company. This infrastructure includes various elements such as hardware, software, networks, and facilities needed to operate applications, systems, and manage business data and daily operational activities (Xdc.indonesia.com, 2024).

The development of infrastructure technology requires clear guidance to achieve the desired goals, considering that information technology infrastructure continues to evolve and evolve endlessly. To ensure that these developments are in line with the set goals, it is necessary to study various important aspects seen in the evolution of information technology (Fitriawati, 2017). According to Ramadhan, networks and information technology (IT) infrastructure have a crucial role in supporting teaching and learning activities in schools (Jaya & Ramadhan, n.d.)

c). Development of Relativistic Learning Content

Learning content development is the process of designing and compiling appropriate and effective materials to achieve learning goals. Content development in teaching activities involves planning and preparing learning materials systematically and on target, this aims to meet the needs of students and achieve educational goals (M.kumparan.com, 2024).

According to (Mardiyah et al., 2024), in their research by creating and multiplying educational content, this also contributes to forming a technology-based learning environment. For example, by utilizing the Instagram application as a tool to assess students' creativity, where students are expected to improve their creativity in PAI subjects.

d). Integration of Islamic Values with Technology

Ensuring that the use of technology in PAI learning remains in line with Islamic values, so that it not only increases knowledge but also shapes students' character in accordance with religious teachings. Character education based on Islamic values helps students face social pressures and digital media more resiliently. They are able to recognize and reject negative influences and apply moral values in life. This integration forms a positive identity that is the basis for healthy and productive self-development (Eryandi, 2023).

As explained in Q.S AL-Mujadilah verse 11:

يَرْفَعِ ٱللَّهُ ٱلَّذِينَ ءَامَنُواْ مِنكُمْ وَٱلَّذِينَ أُوتُواْ ٱلْعِلْمَ دَرَجَٰتٍ ۚ وَٱللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ

It means: *"Allah will exalt those who believe among you and those who are given some degree of knowledge. And Allah knows what you are doing."*

This verse explains the importance of science, which includes knowledge and technology. In PAI learning, the integration of Islamic values with technology not only aims to improve students' understanding, but also to strengthen the position of science which has a role as a serana to improve the quality of human life. By integrating technology in PAI learning, we not only broaden students' horizons but also ensure that the learning remains in line with Islamic principles that can empower them in their daily lives as Muslims.

As according to Wulan, Gunawam, Fauziyah, and Karazt explained Educational approaches that incorporate Islamic values into the learning process can enhance student outcomes. By integrating Islamic principles with science and technology education, students are given the opportunity to connect these fields with real-life concepts and experiences as practicing Muslims. This connection enables students to perceive their learning as more relevant and purposeful. This research seeks to examine the impact of combining science and technology education with Islamic values on students' expected learning outcomes (ELO) (Wulan et al., 2021).

The point is that an educational approach that integrates Islamic values into the learning process can improve student learning outcomes. By incorporating Islamic principles in the study of science and technology, students are given the opportunity to relate these fields to real-life concepts and experiences in their lives as Muslims. This connectedness allows students to feel that their learning is more relevant and meaningful. This study aims to examine the impact of combining science and technology learning with Islamic values on expected learning outcomes (*Expected Learning Outcomes /ELO).*

Table 1. Opportunities, Challenges, and Strategies for Utilizing PAI Learning Media Applications

Aspect	**Opportunity**	**Challenge**	**Strategy**
Interactivity	Interactive media can increase student participation in learning.	Lack of teachers' skills in using interactive media effectively.	Conduct intensive training on the use of interactive learning media for teachers.
Accessibility	Materials can be accessed anytime via digital devices, supporting flexible distance learning.	Limited technological infrastructure, especially in remote areas.	Improve technological infrastructure such as internet networks and adequate hardware.
Learning Methods	Media such as video, animation, and simulation can help explain complex material more easily.	Resistance to changes in learning methods among teachers and students.	Develop innovative learning content suited to students' needs.
Thinking Skills	Problem-solving-based interactive methods improve students' critical and creative thinking skills.	Lack of digital competence among teachers and students.	Integrate Islamic values with technology to enhance material relevance.
Learning Efficiency	Technology can increase the effectiveness and efficiency of PAI learning.	Rigid organizational culture limits the application of	Conduct socialization and regular training to improve technology adaptation in learning.

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Aspect	Opportunity	Challenge	Strategy
		educational technology.	

Discussion

The findings of this study indicate that technology holds significant potential in enhancing the effectiveness of PAI learning. Digital media such as applications and e-learning not only improve access and flexibility but also support active and contextual learning. However, the challenges faced indicate the need for a more comprehensive approach. Limited infrastructure and digital competence must be addressed through educational policies that support the provision of facilities and ongoing training.

Resistance to change must also be managed through awareness campaigns and strengthening digital literacy culture aligned with Islamic values. Religious education does not need to be exclusive from technology but can synergize to form holistic character and knowledge. The strategies recommended in various literature emphasize the importance of collaboration among teachers, government, and the community in creating an inclusive and meaningful digital learning ecosystem. In this way, digital learning media can become an effective tool to transform PAI learning in the digital era.

The findings of this study, which indicate that technology holds significant potential in enhancing the effectiveness of Islamic Religious Education (PAI) learning, are consistent with various relevant literature. The use of digital media such as applications and e-learning has been proven to expand access and increase the flexibility of the learning process. Hoerudin et al. (2023) emphasized that the use of e-learning in PAI learning can support more active and contextual learning. Similarly, Abdullah (2023) found that the utilization of digital media in Al-Islam and Muhammadiyah learning increases students' motivation because the material can be delivered in a more interactive and engaging way.

However, this study also identified challenges such as limited infrastructure and digital competence, which need to be addressed promptly. This is reinforced by the findings of Fitriawati (2017), who explained that uneven development of information technology infrastructure can become a major barrier to the implementation of educational technology. In addition, Isti'ana (2024) highlighted the importance of educational policies that support the provision of adequate digital facilities and ongoing teacher training to optimize the use of technology.

The aspect of resistance to change found in this study is also consistent with the literature. Hayadi et al. (2024) stated that resistance to innovation in education can be overcome through awareness campaigns and the strengthening of a digital literacy culture that aligns with institutional values. In the context of PAI, Eryandi (2023) added that strengthening a digital literacy culture must be integrated with Islamic values to support the holistic development of students' character. This approach is consistent with the views of Abdurrahmansyah and Mustopa (2024), who emphasized that innovative learning media can play an important role in character building in the digital era.

Furthermore, the literature highlights the need for collaboration among various stakeholders to create an inclusive and meaningful digital learning ecosystem. Isti'ana (2024) and Hoerudin et al. (2023) noted that synergy between teachers, government, and the community is crucial

to optimize the use of digital media in PAI learning. Thus, the findings of this study reinforce the evidence that digital technology can be an effective tool in transforming PAI learning in the digital era, provided that challenges related to infrastructure, digital competence, and resistance to change are properly managed.

The findings of this study have several important implications for the development of PAI learning in the digital era. First, policymakers need to prioritize the improvement of digital infrastructure in educational institutions to ensure equitable access for students and teachers. Second, continuous professional development programs focusing on digital pedagogy should be implemented to enhance teachers' competence in integrating technology into Islamic education. Third, awareness campaigns and digital literacy initiatives aligned with Islamic values are necessary to reduce resistance to change and foster a positive mindset toward the use of digital learning media. Finally, the creation of a collaborative ecosystem involving teachers, government, parents, and the community is essential to ensure that digital learning innovations can be sustainable and contribute to the holistic development of students' character and knowledge.

Conclusion

The use of learning media applications in Islamic Religious Education (PAI) has great potential to increase student interactivity, participation, and understanding. Technology allows for wider and more flexible access to learning materials, making the learning process more engaging and effective. However, challenges such as limited infrastructure, lack of digital competence of teachers and students, and resistance to new methods are still obstacles. Therefore, teacher training, infrastructure improvement, relevant content development, and integration of Islamic values with technology are needed. With these steps, the use of technology in PAI learning can be optimized to support more innovative and effective education.

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