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INTEGRATION OF TECHNOLOGY IN IMPROVING THE PROFESSIONALISM OF ISLAMIC RELIGIOUS EDUCATION TEACHERS

Syibran Mulasi [1], Susanna [2], Misbahul Jannah[3]
[1] Sekolah Tinggi Agama Islam Negeri Teungku Dirundeng Meulaboh
[2] Cabang Dinas Pendidikan Wilayah Kabupaten Nagan Raya
[3] Universitas Islam Negeri Ar-Raniry Banda Aceh
Contributor E-mail: syibran@staindirundeng.ac.id

Abstrak

Perkembangan teknologi telah membawa dampak yang signifikan dalam berbagai aspek kehidupan, termasuk bidang pendidikan. Penelitian ini bertujuan untuk menganalisis peran teknologi dalam meningkatkan profesionalisme guru Pendidikan Agama Islam (PAI). Penelitian menggunakan metode kualitatif dengan pendekatan studi literatur, yang melibatkan pengumpulan data dari berbagai sumber seperti jurnal ilmiah, buku, artikel, dan dokumen terkait. Analisis data dilakukan dengan pendekatan analisis isi untuk mengidentifikasi tema-tema utama dan hubungan antara teknologi dan profesionalisme guru PAI. Hasil penelitian menunjukkan bahwa teknologi memiliki potensi besar dalam profesionalisme guru PAI dalam memanfaatkan teknologi melalui berbagai inovasi, seperti media interaktif, aplikasi pembelajaran digital, dan platform e-learning. Teknologi membantu guru menyampaikan materi dengan cara yang lebih menarik dan efisien, serta mendukung siswa untuk belajar secara mandiri dan kolaboratif. Selain itu, integrasi teknologi dalam pengembangan profesionalisme guru PAI terbukti dapat meningkatkan pemahaman siswa terhadap nilai-nilai religius, memperkuat karakter, dan memotivasi mereka untuk aktif dalam proses pembelajaran. Penelitian ini menyimpulkan bahwa pemanfaatan teknologi secara optimal dapat menjadi solusi untuk mengatasi tantangan dalam peningkatan profesionalisme guru PAI. Temuan ini diharapkan menjadi rujukan bagi pengembangan strategi pembelajaran yang lebih inovatif dan relevan dengan kebutuhan pendidikan abad ke-21.
Kata kunci: *Teknologi Pendidikan; Pengembangan Profesional; Pendidikan Agama Islam (PAI); E-learning; Inovasi Pembelajaran*

Abstract

Technological developments have significantly impacted various aspects of life, including education. This research aims to analyze the role of technology in increasing the professionalism of Islamic Religious Education (PAI) teachers. The research uses qualitative methods with a literature study approach, which involves collecting data from various sources such as scientific journals, books, articles, and related

documents. Data analysis used a content analysis approach to identify the main themes and relationships between technology and PAI teacher professionalism. The research results show that technology has great potential in the professionalism of PAI teachers in utilizing technology through various innovations, such as interactive media, digital learning applications, and e-learning platforms. Technology helps teachers deliver material more interestingly and efficiently, and supports students to learn independently and collaboratively. In addition, the integration of technology in the professional development of PAI teachers has been proven to increase students' understanding of religious values, strengthen their character, and motivate them to be active in the learning process. This research concludes that optimal use of technology can be a solution to overcome challenges in increasing the professionalism of PAI teachers. It is hoped that these findings will become a reference for developing learning strategies that are more innovative and relevant to the educational needs of the 21st century.

Keywords: *Educational Technology; Professional Development; Islamic Religious Education (PAI); E-learning; Learning Innovation*

A. INTRODUCTION

Technological developments have significantly impacted various aspects of life, including education (Dewi et al., 2023; Febrianti et al., 2023). Technology has become an indispensable medium in the teaching and learning process, as it can provide easy and faster access to the information needed (Alimuddin et al., 2023), even with its development it has provided space for innovation in learning (Firdos et al., 2023; Nurillahwaty, 2022; Said, 2023). In the context of Islamic Religious Education (in Bahasa, abbreviated as PAI), the use of technology by teachers is one of the strategic steps in improving the quality of learning (Fricticarani et al., 2023; Husein, 2022; Sulistiani et al., 2021) and adapting to the challenges of the times that continue to develop.

Islamic religious education has an important role in shaping the character and morals of students (Judrah et al., 2024; Salisah et al., 2024). However, the challenges of PAI learning in the modern era are not easy. Students born in the digital generation have different learning characteristics and needs from previous generations (Alit & Tejawati, 2023; Rakhmah, 2020; Widiatna, 2020). They tend to be more responsive to learning that is interactive, engaging, and relevant to their world. This condition requires educators, especially PAI teachers, to integrate technology into the learning process to be more effective and fun in adjusting to the conditions desired by students.

On the other hand, the professionalism of teachers is one of the key factors in learning success. Educators are not only required to master teaching materials but also to manage learning creatively and innovatively (Alfath et al., 2022; Surip, 2021). In terms of the use of technology, teacher professionalism includes the ability to choose, adapt, and utilize various technological devices to support the learning process (Husna et al., 2023; Lestari & Kurnia,

2023; Novelita et al., 2023). In other words, a professional PAI teacher must be able to integrate Islamic values with relevant technological approaches.

However, several studies show that the reality in the field is that not all teachers can utilize technology optimally in learning (Lestari & Kurnia, 2023). Some teachers still face obstacles in mastering technology (Melisa, 2024; Mutia et al., 2023) due to limited technical capabilities, access to technological devices, and a lack of training. So that it can impact the lack of optimal PAI learning process through technology, technology-based learning innovations are still not optimal. This condition shows the importance of improving PAI teachers' competence in using technology. Teachers must realize that technology is not a threat but an opportunity to create more meaningful learning. Because through the use of technology, teachers can present various interesting learning media, such as educational videos, interactive applications, to online learning platforms (Ariani et al., 2023; Hakim & Yulia, 2024; Wibowo, 2023; Widyawati & Sukadari, 2023), which provides excellent opportunities for collaboration and broader discussion.

However, on the other hand, the use of technology in PAI learning must still pay attention to the principles of Islamic teachings(Ayudhia et al., 2024; Khofifah et al., 2024). Technology must support the formation of noble morals and strengthen religious values. PAI teachers are responsible for ensuring that the technology used is technically advanced and in accordance with ethical and religious norms. So PAI learning not only provides knowledge, but also shapes the character of students based on Islamic values (Hartati, 2021; Shofiyyah et al., 2023; Zain et al., 2024).

With the ability to adapt to technology, PAI teachers can make learning innovations more relevant, engaging, and effective so that it will have an impact on improving the quality of Islamic religious education and their professionalism, which will give birth to a generation that is not only intellectually intelligent, but also superior in morals and morals. Thus, efforts to improve the professionalism of PAI teachers through mastery of technology must be a common priority to create quality educators following the demands of the times.

In the ever-evolving digital era, teacher professionalism is one of the important elements in determining the success of education. Especially for Islamic Religious Education (PAI) teachers, the challenges of the 21st century require teachers not only to master the substance of teaching materials, but also to utilize various technologies to improve the quality of learning and develop self-professionalism. However, various obstacles, such as low digital literacy, limited infrastructure, and resistance to change, still hinder the optimal use of technology. This raises the need to examine how technology can support the development of professional competencies of PAI teachers, both in pedagogic, managerial, and professional aspects. Therefore, this research focuses on technology's role in developing PAI teachers' professionalism and strategies to overcome its implementation challenges. This research provides a comprehensive overview of the use of technology to support the improvement of teacher professionalism. It offers strategic solutions to increase the effectiveness of its implementation in various educational contexts.

B. RESEARCH METHODS

This research uses a qualitative method with a literature study approach (Darmalaksana, 2020; Syahputri et al., 2023) to examine the role of technology in improving the quality of Islamic Religious Education (PAI) learning. Literature study is an approach that focuses on collecting, analyzing, and interpreting data sourced from various references, such as scientific journals, books, articles, research reports, and other relevant documents (Darmalaksana, 2020; Syahputri et al., 2023). This method is used because the researcher aims to gain a deep understanding of the topic studied by exploring concepts, theories, and previous research results(Andriani, 2021; Pugu et al., 2024)

The research was carried out in several stages, including identifying and determining relevant data sources. Data were collected from the literature related to the application of technology in education in general and PAI learning in particular. Data sources are taken from scientific repositories, such as *Google Scholar*, *ResearchGate*, or other research and discussion results that have been digitized and can be accessed online, with the criteria for selecting information up-to-date for at least the last 5 (*five)* years. *Furthermore*, qualitative data analysis was carried out using a content analysis approach. This technique is used to identify key themes, patterns, and relationships from the data that has been collected. Researchers read, record, and group information from various sources to produce a comprehensive synthesis. Meanwhile, the results of the data analysis will be used as the basis for answering research questions on how technology contributes to improving the quality of PAI learning. The discussion covered various aspects, such as the integration of technology in teaching methods, the use of digital-based learning applications, the use of interactive media, and its impact on learning effectiveness and the development of students' religious competence.

C. FINDINGS AND DISCUSSION

1. Definition and Concept of Technology in Education

Technology can generally be defined as the application of science to create tools, systems, or methods that facilitate human activities. Technology encompasses all hardware, software, and technology-based approaches designed to support education's teaching and learning process (Zhang, 2022). Technology in education includes digital devices such as computers or applications, and methodologies, strategies, and systems used to improve learning effectiveness. This shows that educational technology has a broad dimension, involving the interaction between tools, methods, and humans in the context of education.

Educational and instructional technology are often used interchangeably, but have different focuses. Educational technology refers to the overall application of technology to improve learning management, delivery, and evaluation. This includes technological devices such as Learning Management Systems (LMS), hardware (e.g., projectors, tablets), and digital infrastructure to support the education ecosystem. (Matthew et al., 2021; Munna et al., 2024).

In contrast, instructional *technology* focuses more on the design, development, and application of technology to directly support the teaching and learning process. Learning technology is more specific in helping teachers and students to achieve certain learning goals. For example, computer-based simulations, interactive videos, and learning apps like *Kahoot* or *Quizizz* are learning technologies designed to support student learning activities.

The main difference between the two lies in their scope and purpose. Educational technology has a broader scope, encompassing educational management systems and technology-based curriculum development, while learning technology is more focused on methods and tools used directly in the teaching and learning process. According to Januszewski, learning technology is a part of educational technology that aims to create an effective and efficient learning experience(Haleem et al., 2022; Tuma, 2021).

Technology is vital in education as a tool, medium, and learning environment. As an aid, technology helps teachers and students in the learning process by providing devices that speed up and facilitate access to information, such as computers, tablets, and learning software. This tool guides teachers to organize more engaging and interactive teaching materials, while students can learn independently using various digital learning apps and resources. In this context, technology also functions as a learning medium that conveys information through various formats, such as videos, animations, or interactive simulations. This aligns with the view of Mayer (Matias & Agapito Jr, 2022), who stated that multimedia learning can improve student understanding through a combination of visual and auditory elements(Mashudi et al., 2021).

Furthermore, technology also creates a learning environment that supports collaborative interaction and time flexibility. With *Learning Management Systems* (LMS) such as *Google Classroom*, *Edmodo*, or *Moodle*, teachers can easily manage online classes, assign assignments, and monitor student progress. This technology also provides opportunities for students to learn in a more flexible atmosphere, anywhere and anytime, thus supporting more personalized learning according to each individual's needs and pace of learning.

As a facilitator, technology helps create a more effective, efficient, and enjoyable learning experience. Its effectiveness can be seen from how technology can make complex material easier to understand through visualization or simulation. Efficiency is achieved by reducing the time required to access information or manage educational administration. In addition, technology also makes learning more enjoyable by bringing *gamification* to education, such as that offered by apps like *Kahoot* and *Quizizz*. According to Kapp, *gamification* in education increases student engagement and makes them more enthusiastic about participating in learning(Raju et al., 2021).

Technology development in education has evolved from simple tools such as whiteboards to complex digital technology. In the early 19th century, whiteboards became a revolutionary tool that helped teachers deliver material to the entire classroom more effectively. Over time, innovations such as overhead *projectors* in the 1960s and videocassette tapes in the 1980s began to be used to support visual learning. By the end of the 20th century, personal computers became an important part of education, with software such as Microsoft Office and interactive multimedia beginning to be used in the classroom(Bay, 2022; Roy & Roy, 2021).

Entering the digital era, internet-based technology is changing the learning paradigm. The emergence of *Learning Management Systems* (LMS) such as *Moodle*, Blackboard, and *Google Classroom* allows teachers to manage classes online, upload learning materials, assign assignments, and monitor student progress. LMS not only aids in learning administration but also encourages interaction between students and teachers through online discussions and instant feedback. According to the use of LMS significantly improves the accessibility and

flexibility of learning, especially in the COVID-19 pandemic, when online learning is a significant need(Ulanday et al., 2021).

The development of internet-based technology also facilitates mobile-based learning (*mobile learning*). With increased access to smart devices and internet connections, students can now learn anytime and anywhere through learning apps like *Duolingo, Coursera*, and *Khan Academy*. Mobile learning enables personalized and flexible learning, supporting *lifelong learning*. Recent research shows that *mobile learning* can increase student engagement and provide a more contextual and relevant learning experience(Šramová, 2024).

Education continues transforming with technological advances such as artificial intelligence (AI) and *augmented reality* (AR). This technology expands access to education and creates a more interactive and adaptive learning experience. The evolution of technology in education shows excellent potential to improve the quality of learning, making it more inclusive, practical, and relevant to the needs of the times.

Educational technology includes various components that support each other to create a more effective learning process. One of the main components is hardware, such as computers, tablets, projectors, interactive whiteboards, and other smart devices. This hardware is becoming the primary tool teachers and students use to access and manage information. On the other hand, software or software such as learning applications (*Kahoot*, *Duolingo*), *Learning Management Systems* (*Google Classroom, Moodle*), and data processing tools (*Microsoft Excel, Google Sheets*) allow the teaching and learning process to be more interactive, structured, and can be monitored in real-time(Kwon et al., 2021).

In addition to hardware and software, educational technology infrastructure plays an important role. A stable internet network, data storage servers, and e-learning platforms sustain educational technology. With good infrastructure, the accessibility of learning increases, allowing students from various geographical backgrounds to learn without space and time limitations. An infrastructure such as extensive broadband networks and affordable smart devices contributes significantly to the equitable distribution of technology-based education(Makinde et al., 2025), especially in rural or remote areas.

The final component is human resources, namely, teachers and students using technology in learning. Teachers are central in designing, managing, and utilizing educational technology effectively. This requires adequate digital competence to integrate technology with appropriate learning methods. On the other hand, students as end-users must have digital literacy skills to use technology in their learning. Developing 21st-century skills for teachers and students, such as critical thinking skills and technological adaptation, is the key to successfully applying educational technology(Yeni, 2022; Yılmaz, 2021).

The combination of competent hardware, software, infrastructure, and human resources ensures that educational technology can be applied effectively. However, to achieve optimal outcomes, ongoing training for teachers, adequate facilities, and strong education policy support are needed to support holistic technology integration.

Technology in education can be defined as applying various technology-based devices, tools, and strategies to improve the teaching and learning process. The approach to technology in education encompasses three main functions: as a teaching aid, a learning medium, and a virtual learning environment. Technology helps teachers convey material more transparently

and engagingly as a teaching tool through multimedia presentations, simulations, or interactive applications. As a learning medium, technology is a channel for transferring information, such as using *videos, e-books*, or online learning platforms. Meanwhile, as a virtual learning environment, technology allows the creation of learning spaces without physical limitations, such as online classes through *Learning Management Systems* (LMS) or *virtual reality* for complex learning simulations(Kovtoniuk et al., 2022).

The principles of using technology in education include effectiveness, efficiency, and sustainability. Effectiveness emphasizes how technology can help achieve learning objectives by improving student understanding through interactive and multimodal approaches. Efficiency involves using technology to save time, effort, and costs in the learning process, such as automating teachers' administrative tasks or providing quick access to teaching materials through digital devices. Sustainability refers to how technology can be applied consistently over the long term by considering the availability of adequate resources and training for teachers and students. The technology applied in education must be designed to meet current needs and evolve according to technological changes and future educational needs(Alenezi et al., 2023).

2. The Role of Technology in the Professional Development of PAI Teachers

Technology has become an important element in the professional development of Islamic Religious Education (PAI) teachers. In modern education, technology provides opportunities to improve teachers' pedagogical competence, content knowledge, and managerial abilities. Technology provides tools that enable PAI teachers to access diverse learning resources, design more interactive learning, and conduct more effective evaluations. According to a study by Al-Ashmawy, technology can help religious teachers create learning relevant to learners' needs in the digital age(Butarbutar et al., 2023), such as through interactive videos, simulations, and online learning platforms.

A study by Al-Ashmawy et al shows that technology allows for more interactive religious teaching through interactive videos, learning simulations based on Islamic values, and *online* discussion *platforms* to encourage students to develop critical thinking(Butarbutar et al., 2023). In addition, Rahman stated that technology can expand teachers' access to in-depth and contextual learning materials (Akyuz, 2023), which can help support students' spiritual and intellectual needs.

PAI teachers are expected to be able to utilize technology to support their professional duties, both in teaching, conducting research, and developing personal skills. Information technology, such as *Learning Management System* (LMS), educational social media, and online-based applications, makes it easier for teachers to collaborate with colleagues, access learning materials based on Islamic values, and develop innovative teaching methods. For example, research shows that integrating technology in Islamic religious learning helps increase students' engagement and strengthen their understanding of Islamic values(Hilman, 2025).

Technology-based professional development also accommodates a student-centered learning model, leveraging *Learning Management Systems* (LMS) such as *Moodle* to provide content that meets students' individual needs. This aligns with the *Technological Pedagogical Content Knowledge* (TPACK) concept, emphasizing the balance between technological

knowledge, pedagogy, and content. According to Mishra and Koehler, PAI teachers who master TPACK can design more effective contextual learning(Nurhidayati, 2024).

Theoretical approaches such as *the Technological Pedagogical Content Knowledge* (TPACK) model are relevant in understanding how PAI teachers can integrate technology in learning. This model emphasizes balancing technological mastery, pedagogy, and content. Teachers with TPACK competence can design effective learning using technology to achieve pedagogical goals and support content delivery(Nurhidayati, 2024). In addition, *the theory of connectivity* introduced by Siemens also highlights the importance of relationships or connections between teachers and education managers in the learning process in the digital era.

However, technology integration is not free from challenges. Wahyudi found that most PAI teachers face obstacles in limited access to technology, lack of practice-based training (Nurhidayati, 2024), and resistance to changes in traditional teaching methodologies (Maulidin et al., 2025). Nevertheless, the use of technology remains a strategic solution to bridge the gap in the professional competency development of PAI teachers in the digital era. Thus, PAI teachers go through specially designed and practical needs-based training to strengthen digital literacy so that it can improve the competence of Islamic religious education teachers in utilizing technology for relevant, innovative, and effective religious learning in the future.

3. The Form of Using Technology Applications in the Development of PAI Teachers' Professionalism

The use of technology in learning has skyrocketed in recent years, with various *platforms* and applications designed to support a more interactive and practical learning process. One widely used technology form is *online* learning *platforms* such as the *Learning Management System* (LMS). Popular examples of LMS are *Google Classroom* and *Microsoft Teams*, which teachers can use to manage classes virtually. *Google Classroom* provides tools for distributing assignments, providing feedback, and tracking student progress in *real-time. Microsoft Teams*, on the other hand, integrates learning with communication through chat features, video meetings, and document collaboration. Research shows that using *Google Classroom* significantly increases student engagement in online learning(Anjarwati et al., 2021; Eraković & Topalov, 2021; Tin et al., 2024).

Classroom management apps and learning materials such as Edmodo and *Schoology* have become essential tools for teachers today. Edmodo makes it easy for teachers to create learning communities, share materials, and communicate with students safely. Similarly, *Schoology* offers features for curriculum management, student progress tracking, and collaboration between students and teachers. A states that these two applications support more structured learning and improve interaction between teachers and students(Molenaar, 2022), even in online learning environments.

In the context of interactive media and learning support tools, apps like Kahoot and Quizizz have changed how teachers measure student understanding. *Kahoot* is a game-based quiz platform that can be used to evaluate students' knowledge in a fun way. Quizizz, conversely, provides convenience for students to learn online, which can be accessed at any

time and provides instant feedback. Studies show that interactive tools like this increase students' motivation to learn and improve information retention (Ananda & Putri, 2024).

Learning videos and webinars are also an important component of modern learning. Learning videos allow students to access the material more flexibly, while webinars provide an opportunity for direct interaction with expert speakers. In the Islamic Religious Education (PAI) context, learning videos can explain complex concepts such as fiqh or the interpretation of the Quran through engaging animations or illustrations. PAI webinars can bring religious leaders or academics together to discuss topics relevant to students' lives and needs. A study emphasized that integrating videos and webinars in PAI learning can increase students' understanding of the material and provide a more immersive learning experience (Isti'ana, 2024; Yasir, 2025)

D. CONCLUSION

The integration of technology in education has paved the way for the significant development of the professionalism of Islamic Religious Education (PAI) teachers. Technology helps create a more effective, efficient, and enjoyable learning experience for teachers and enriches teaching and learning methods. Through learning videos, PAI teachers can more attractively explain complex concepts such as fiqh or interpretation of the Qur'an through attractive animations or illustrations. This makes the material taught easier for students to understand and remember. In addition, technology such as webinars can present religious leaders or academics in hands-on discussions that discuss contemporary topics relevant to student development. Integrating videos and webinars in PAI learning enhances students' understanding of the material and provides a more immersive and interactive learning experience. With this technology, the teaching and learning process becomes more dynamic and can overcome space and time limitations.

This is a strategic step to answer the challenges of the digital age. Educational technology expands access to learning and training resources, enriches learning methods, strengthens pedagogical competence, and encourages collaboration and continuous innovation among PAI teachers. For its implementation to be more optimal, a comprehensive strategy is needed, ranging from increasing teachers' digital literacy and infrastructure support to education policies that favor ethical digital transformation based on Islamic values.

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