The Utilization of Information Technology forthe Professional Development of Islamic Education Teachers in Indonesia

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Article Info	Abstract
  Copyright (c) 2023 M. Ikhwan, Muhammad Fuadi, Mailizar Mailizar, Misbahul Jannah	The professional development of Islamic Religious Education (PAI) teachers is crucial to enhancing the quality of PAI learning in schools. One effective means to support their professional growth is through the utilization of technology as a learning medium and information source. This article aims to explore the use of technology by PAI teachers in their professional development, focusing on three key aspects: (1) The Importance of Integrating Technology in Teacher Professionalism; (2) Types and Functions of Technology Used by PAI Teachers; (3) Challenges Encountered by PAI Teachers in Advancing Professionalism through Technology. The research methodology used the qualitative method with the literature review approach, encompassing data collection and analysis from diverse sources such as journals, books, reports, and websites. The findings reveal that PAI teachers in Indonesia employ various technologies, including computers, laptops, smartphones, tablets, internet connectivity, social media platforms, applications, and software, for multiple purposes like information retrieval, communication, collaboration, content creation, presentation, and assessment of learning. The use of technology among PAI teachers yields several advantages, including the enhancement of knowledge, skills, motivation, creativity, networking opportunities, and learning resources. However, they face challenges related to limited infrastructure, access, costs, and support. Moreover, there's a lack of readiness, competence, and awareness regarding ethics and security among these educators. PAI teachers encounter difficulties, obstacles, and risks such as network disruptions, viruses, malware, spam, phishing, hacking, cyberbullying, and plagiarism. The challenges of utilizing technology for teacher professional development encompass skills, attitudes, infrastructure, and ethical considerations. Therefore, PAI teachers must possess adequate competence and readiness to integrate technology into their professional development.

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Introduction

Islamic religious education (PAI) is one of the subjects taught in schools in Indonesia, both at the primary, secondary, and higher education levels. PAI aims to form students who have faith, piety, noble character, and Islamic insight (Mansir, 2022; Tuna, 2022). To achieve this goal, professional, competent, and qualified PAI teachers are needed. The professional ability of teachers, especially in teaching duties, is an important element in the education profession (Makovec, 2018; Muzakki, 2022). Interaction in the learning process, involving teachers and students, is essential communication, resulting in emotional connection and harmonious cooperation. A professional teacher must have exceptional skills in education and teaching (Jones, 2021; Zuhaida, 2019). Professional teachers are educators who can carry out their duties with proficiency and ability in education and teaching.

The ability of a teacher to carry out his duties involves mastery of subject matter, the ability to plan learning, competence in assessing student learning outcomes, teaching experience, and a deep understanding of student conditions. PAI teachers, as learning agents, have a very important role in the learning process in the classroom. PAI teachers are not only required to master PAI material but also must be able to deliver it with appropriate and effective methods, media, and evaluations. In addition, PAI teachers must also be able to adapt to the times, the needs of students, and global challenges (Rahman, 2016).

PAI teachers must have expertise in addition to their scientific fields of compiling teaching materials and teaching methods, but they must also uphold professionalism. It is necessary to create an educational environment that is based on a deep understanding of the teaching-learning process, curriculum, and learning styles of students (Willems & Van den Bossche, 2019). Minister of Education and Culture Number 16 of 2007 stipulates that teachers must develop four main competencies, which include pedagogic, personality, social, and professional competencies. Educators must be able to demonstrate effective and appropriate performance (Jujur, 2023). PAI teachers have more responsibility than teachers in other fields of study because PAI teachers not only carry out the task of teaching religion but also play a role in shaping and strengthening the character morals of their students (Kasman et al., 2022; S & Riadi, 2020). The competence of a PAI teacher lies not only in his personality but also in a deep understanding of the noble values that are lived and practiced.
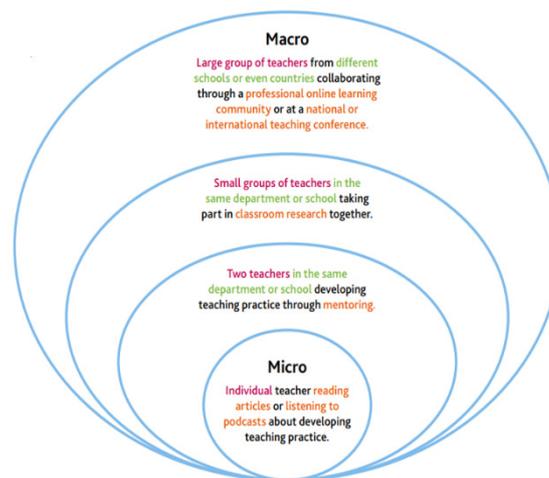
The PAI teacher must have strong pedagogical abilities to carry out educational tasks (Zubairi & Nurdin, 2022). In essence, a professional teacher in the 4.0 era needs to have a variety of competencies to carry out their duties professionally (Masdoki et al., 2021). One way to improve the professionalism, competence, and quality of PAI teachers is to participate in professional development on an ongoing basis.Professional development is a lifelong learning process that involves reflection, learning, and action activities to improve a teacher's knowledge, skills, and teaching practices (Angus Cole, 2021). Professional development can be done through various activities, such as training, workshops, seminars, conferences, comparative studies, research, collaboration, and mentoring (Romanova et al., 2022).

In the era of globalization and Industrial Revolution 4.0, the professional development of PAI teachers cannot be separated from the role of technology. Technology can be used as a learning medium and source of information that can help PAI teachers improve their knowledge, skills, motivation, and creativity(Engkizar et al.,

2018) Technology can also be a medium for PAI teachers to communicate, collaborate, and share experiences with other PAI teachers in a wider context.

Related to teacher professional development with the use of technology can be observed in the illustration illustrated by (Angus Cole, 2021) below:

Figure 1.1:
Illustration of professional development

However, the use of technology in the professional development of PAI teachers also raises several problems, such as limited infrastructure, access, costs, and support; a lack of readiness, competence, and awareness of ethics and security; and the potential conflict between Islamic values and technological values (Rahman, 2016). Therefore, there is a need for an in-depth and comprehensive study of the use of technology in the professional development of PAI teachers, especially in the Indonesian context.

Based on the description above, this article aims to examine the use of technology by PAI teachers in the Indonesian context, focusing on three aspects, namely: (1) the urgency of using technology in teacher professional development; (2) the types and functions of technology used by PAI teachers; (3) the challenges faced by PAI teachers in professional development using technology.

Research Method

This research used the qualitative method as one of the prevalent approaches, wherein data is gathered in the form of words, images, and observations rather than numerical data. Drawing upon Lexy J. Meleong's book, "Qualitative Research Methods," highlights qualitative research as a procedural tool for generating descriptive data (Moleong, 2018). The essence of the qualitative research method utilized in this study lies in its investigative process, which enables a gradual understanding of social phenomena before their application, comparison, reflection, categorization, and classification of the study's elements (Fiantika et al., 2022).

The research approach used is a literature study. A literature study is a research method that collects and analyzes data from various sources relevant to the research topic, such as journals, books, reports, and websites (Nawab et al., 2021) The study of literature can be used to unearth, critique, and synthesize existing knowledge about

a phenomenon, as well as to identify loopholes, contradictions, and opportunities for further research (Snyder, 2019). The steps carried out in the literature study are as follows:

First, determine the research question, namely: How is the use of technology by PAI teachers in the Indonesian context, especially in terms of types and functions, benefits and challenges, and strategies and recommendations to improve it? Second, determine inclusion and exclusion criteria, namely: the sources used must be in Indonesian or English, from 2010 to 2023, related to technology, professional development, and PAI teachers, and have good credibility and representation.

Third, conduct a source search, namely: using an online search engine, using *Google Scholar, Garuda Portal, Moraref, and Crossref, and Publish or Perish* with keywords such as "Islamic technology and education", "PAI teacher professional development", and "PAI learning media". Fourth, selecting sources, namely: filtering sources found based on inclusion and exclusion criteria, and reading titles, abstracts, and keywords to determine relevance to the topic research.

Fifth, evaluate sources, namely: check the quality and validity of sources using criteria such as objectives, methodologies, results, conclusions, and references, and compare with other similar sources. Sixth, analyze sources, namely: read critically and deeply the selected sources and record important points, findings, arguments, and evidence related to the research question.

And seventh, synthesizing sources, namely: grouping, linking, and integrating key points, findings, arguments, and evidence from various sources; and eighth, compiling a framework and narrative that can be understood (Wright, 2019).

Figure 1.2: Research pipeline

Define a topic
Addressing research questions
Search for and acquire relevant literature
Selecting and evaluating literature
Read and summarize the main points
Analyze and critique selected literature
Synthesize selected literature
Write the results of a literature review

In this study, data synthesis and narrative analysis were conducted continuously to ensure that the research objectives were successfully achieved. The data collected underwent a thorough examination and interpretation. This model encompasses data reduction, data display, data verification, and conclusion. By employing this rigorous analytical approach, the research findings are deemed credible and reliable (Miles et al.,

2019). Before reaching this stage, research discussions were carried out simultaneously to extract research findings into applicable forms, ultimately giving rise to perspectives on using technology in teacher professional development that could contribute to the advancement of Islamic education in Indonesia today. Finally, a representation is presented as a systematic compilation of information from which conclusions can be drawn. This process is necessary because the data collected during qualitative research, typically in the form of narratives, needs to be simplified without losing its essence. The aforementioned findings pertain to the presentation of Islamic philosophy for the development of Islamic education, which is discussed to arrive at well-founded conclusions.

Results and Discussion
The Urgency of Using Technology

The professional development of PAI teachers is one of the important things in improving the quality of religious education in Indonesia. As a PAI teacher, it is not only required to have a deep understanding of the teachings of Islam but also to be able to teach and communicate subject matter effectively and interestingly for students. In addition, PAI teachers must also be able to adapt themselves to the times, especially in the era of the Industrial Revolution 4.0, which is marked by advances in digital and information technology (Putri Husma et al., 2023).

Digital and information technology can be very useful tools in the PAI learning process, such as presentations, videos, animations, games, and social media. By using technology, PAI teachers can make PAI learning more interactive, varied, and fun for students (Beardsley et al., 2021). In addition, technology can also help PAI teachers access wider and more up-to-date learning resources, as well as collaborate with other PAI teachers in the professional community (Imants & Van der Wal, 2020).

As a PAI teacher, you can use various types of technology, such as computers, laptops, smartphones, tablets, the internet, social media, applications, and software, for various purposes, such as finding information, communicating, collaborating, creating materials, presenting materials, and evaluating learning. The types of technology most often used by PAI teachers are smartphones and the internet, because they are easily accessible, cheap, and practical (Lie et al., 2020) The most dominant function of technology is as a learning medium and source of information because it can assist PAI teachers in developing knowledge and skills relevant to the curriculum and the needs of students.

Benefits faced by PAI teachers in using technology. The use of technology by PAI teachers provides benefits such as increasing knowledge, skills, motivation, and creativity, as well as expanding networks and learning resources. PAI teachers feel more confident, professional, and innovative in carrying out their duties and responsibilities as educators. In addition, the use of technology can also improve the quality of PAI learning because it can attract the interest, attention, and participation of learners, as well as facilitate interaction, variety, and differentiation of learning.

Application for The Development

Recent developments indicate that teachers are expected to have the ability to use tools that can be used for professional development (Laurillard et al., 2018; Schaaf, 2018)and a series of MOOCs, providing both quantitative and qualitative data. Findings

indicate that the Learning Designer enables an online community of teachers from across the K-12, further and higher education sectors (~400 per day In line with that, to encourage the professional development of teachers in Indonesia, several applications have been created that can function as a medium for learning and teaching, as can be seen in the explanation below:

Table 1.1:Teacher Professionalism Development Platform

Platform	Excess	Deficiency
Merdeka Belajar The *Merdeka Belajar* application issued by the Ministry of Education, Culture, Research, and Technology is designed to support distance learning and provide access to education to students throughout Indonesia. The app offers a variety of features, including learning materials from elementary to secondary school levels, learning videos, online exams, and competency certifications.	• Broad Access to Education: Provide access to education to students throughout Indonesia, including in remote areas that may not be easy to reach by conventional education systems. • Standardized Curriculum: Provide learning content that is in line with the national curriculum, ensuring consistency in the material learned by students across the country. • Time and place Flexibility: Allows students to study independently according to their schedule and free time without being tied to rigid study hours. • Diverse Learning Content: Provides a variety of learning materials, videos, and online exams that help students understand the subject matter. • Measuring Progress: Online exams and competency certifications help students measure how much they understand the material being learned.	• Uneven Internet Access: There are still areas in Indonesia that have limited or even no internet access, so students in those areas may have difficulty accessing this application. • Limited Teacher-Student Interaction: Lack of direct interaction between teachers and students can hinder learning, especially in providing personalized guidance and supporting individual students. • Technical Challenges: The use of technology in learning can be a challenge for students or teachers who are less familiar with technology, especially in overcoming technical problems that may arise. • Supervision and Compliance: The difficulty of supervising students' attendance, liveliness, and adherence to online assignments or exams can be problematic. • Dependence on Technology: Reliance on these applications can make students less trained to learn conventionally or develop social skills and other skills outside of technology.
Rumah Belajar The *Rumah Belajar* application was issued by the Indonesian Ministry of Education, Culture, Research, and	• Standardized Curriculum: Provide learning materials that are under the national curriculum, ensuring consistency in learning throughout Indonesia. • Various Learning Materials: Provide learning modules, videos, practice questions, and various educational content for various levels of	• Limited Internet Access: There are still areas in Indonesia that have limited or unstable internet access, so students in those areas may have difficulty accessing this platform. • Lack of Personal Interaction with Teachers: Limited direct interaction between students and teachers can hinder direct questions or individualized help

Technology as an online learning platform that aims to support distance education in Indonesia	education, from elementary to high school, even including vocational education. • Learning Flexibility: Gives students the freedom to learn at their own pace and time, allowing learning tailored to individual levels of understanding. • Full Support for Distance Learning: It is one of the government's efforts to support distance education, which is especially important in emergencies or conditions that limit physical access to schools. • Easy and Free Access: Providing easy and free access to students across Indonesia, helping to reduce the gap in access to education.	for students in need. • Technical Challenges: The use of technology in learning can be a challenge for students or teachers who are less familiar with technology, especially in overcoming technical problems that may arise. • Dependence on Technology: Students may become overly dependent on technology and less adapted to conventional learning or social skills development. • Not Always Updated or Diverse Content: Sometimes, a lack of content updates or a limited variety of learning materials can hinder the effectiveness of the platform.
Canva Canva is a popular and easy-to-use online graphic design platform, designed to allow users with varying levels of design skills to create engaging visual content	• Ease of Use: The intuitive interface makes it easy to use even for beginners without a graphic design background. • Wide Range of Templates and Designs: Provides thousands of customizable templates, design elements, graphics, and images for different design needs, from social media to business presentations. • Extensive Customization: Provides flexibility to change colors, fonts, layouts, and other elements according to user preferences. • Collaboration Feature: Allows users to collaborate on designs with teams or others online, simplifying the editing and revision process. • Versatility of Use: Suitable for various purposes such as social media design, presentations, posters, greeting cards, and more, making it very useful in various contexts.	• Feature Limitations on Free Version: Most of the advanced features or premium design elements are only available by subscribing to the premium version, while the free version has limitations. • Dependence on Internet Connection: It requires a stable internet connection to access the platform and save the design, which can be an obstacle for users with unstable connections. • Complexity for Highly Customized Designs: While easy to use, some highly custom designs may require further graphic design knowledge beyond the capabilities provided by Canva. • Export Format Limitations: Limitations on file formats that can be exported in the free version can be an obstacle for users who need a specific file format. • Dependency on Templates: While templates are helpful, there is a risk that the resulting design may look generic or less unique due to excessive reliance on templates.

PINTAR		
PINTAR is an acronym for *Pusat Informasi Pelatihan dan Pembelajaran* issued by the Indonesian Ministry of Religious Affairs and designed to provide access to integrated and varied religious education for Indonesians	• Religious Education Materials: Provides a variety of Islamic and other religious education content that includes the Qur'an, hadith, fiqh, religious history, and others. • Broad and Free Access: Provide broad and free access to the public to obtain religious and religious knowledge easily and flexibly. • Standardized Curriculum: Presenting standardized material and by the religious curriculum set by the Ministry of Religious Affairs. • Interactive and Educational: Presenting material with interactive methods, such as quizzes, videos, and other multimedia content to increase knowledge absorption. • Distance Learning Support: Help support distance education, especially in remote areas that are difficult to reach by formal education institutions.	• Limitations in Material and Quality: Sometimes, limitations in the depth of material or quality of content can be an obstacle in providing a comprehensive understanding. • Dependence on Internet Access: Like most online applications, dependence on a stable Internet connection can be an obstacle for users in areas with limited access. • Control and Supervision: Challenges in supervision and control over the understanding and application of material by users can be problematic. • Dependence on Self-Reliance: Reliance on users for self-study without direct guidance from teachers or religious leaders can affect deeper understanding. • Limitations of Direct Interaction: Limited direct interaction with teachers or others in deepening religious understanding can be an obstacle in the learning process.

After delving into the various applications highlighted earlier, it's clear that each boasts a unique array of strengths and weaknesses. When considering the broader educational landscape, harnessing the endorsed applications by the Ministry of Education and Culture such as *Merdeka Belajar* (Marisana et al., 2023) and *Rumah Belajar* (Warsita, 2019) proves highly advantageous owing to their adherence to standardized curricula. Similarly, within the realm of religious education, the Ministry of Religious Affairs-sanctioned PINTAR application stands out as an exemplary resource, encompassing a comprehensive array of religious materials.

Furthermore, the Canva platform emerges as an invaluable instrument in elevating the professionalism of educators, serving the needs of teachers associated with both the Ministry of Education and Culture and the Ministry of Religious Affairs (Pelangi, 2020). Its prowess in graphic design presents a versatile avenue for skill enhancement within educational spheres, offering a range of possibilities for development and innovation.

If grouped, it can simply be divided into several forms of technology that can be used in the professional development of the teacher, including Audio technology is technology that uses sound as a learning medium, such as radio, tapes, CDs, MP3s, and podcasts. Audio technology can be used by PAI teachers to deliver materials, examples, lectures, dialogues, songs, or prayers related to PAI (Nuryana, 2019).

Visual technology is technology that uses images, graphs, diagrams, or symbols as learning media, such as posters, books, magazines, slides, and whiteboards. Visual technology can be used by PAI teachers to illustrate concepts, facts, data, or illustrations related to PAI (Nuryana, 2019).

Visual-audio technology is technology that uses a combination of sound and images as learning media, such as television, film, video, DVD, and animation (Beisiegel et al., 2018; Chen et al., 2020). Visual-audio technology can be used by PAI teachers to display situations, events, characters, or stories related to PAI (Yahya, 2022). Internet-based technology, which is technology that uses the internet network as a learning medium, such as computers, laptops, smartphones, tablets, social media, applications, and software. Internet-based technology can be used by PAI teachers to find information, communicate, collaborate, create materials, present materials, and evaluate learning related to PAI(Gerard et al., 2019; Huang et al., 2019).

Challenges of Using Technology for Teacher Professional Development

The use of technology by PAI teachers faces challenges, such as limited infrastructure, access, cost, and support, as well as a lack of preparedness, competence, and awareness of ethics and safety. PAI teachers experience difficulties, obstacles, and risks in using technology, such as network interference, viruses, malware, spam, phishing, hacking, cyberbullying, and plagiarism. If mapped, the challenges of using technology in teacher professional development include aspects such as skills, attitudes, infrastructure, and ethics. Therefore, PAI teachers must have adequate competence and readiness to integrate technology into PAI learning.

First, Skill Challenge. One of the challenges faced by PAI teachers in using technology is limited skills in operating and utilizing technology optimally. Many PAI teachers are still not proficient in using technology, both in terms of hardware and software. For example, a PAI teacher may not know how to connect a laptop with a projector, create engaging presentation slides, edit learning videos, or create online quizzes. This can hinder the effective and efficient learning process of PAI (Fernández-Batanero et al., 2022).

To overcome these challenges, PAI teachers need to improve their technology skills through training, workshops, seminars, or courses relevant to their field of study. PAI teachers also need to practice and experiment with available technology, as well as find learning resources that can help them learn new technology. In addition, PAI teachers also need to share experiences and exchange information with other PAI teachers who are more experienced in using technology.

Second, Attitude Challenge. Another challenge faced by PAI teachers when using technology is a less positive and open attitude towards technology. Some PAI teachers may feel afraid, hesitant, or lazy to use technology in PAI learning. They may think that technology is incompatible with religious values or that technology cannot replace the role of PAI teachers in guiding learners. They may also feel uncomfortable or insecure with technology, or feel that technology is too complicated and troublesome (Van Mieghem et al., 2020)there have been many policy developments in and reviews of inclusive education (IE.

To overcome this challenge, PAI teachers need to change their attitudes towards technology to be more positive and open. PAI teachers need to realize that technology is a tool that can support the PAI learning process, not threaten or replace their role. PAI teachers also need to understand that technology can help them develop their professionalism as well as provide benefits for students. In addition, PAI teachers also need to have high motivation and commitment to learning and using technology.

Third, Infrastructure Challenges. The next challenge faced by PAI teachers in

using technology is the availability and quality of infrastructure that supports the use of technology. The infrastructure here includes the facilities, equipment, networks, and resources necessary to operate and utilize the technology. Many schools in Indonesia still have inadequate infrastructure to support the use of technology in PAI learning. For example, damaged school buildings, low availability and quality of electricity, slow or unstable internet connections, limited or outdated technological equipment, and incomplete or outdated learning resources (Thoifah & Biantoro, 2021).

To overcome this challenge, PAI teachers need to collaborate with relevant parties, such as the government, schools, parents, and communities, to improve the infrastructure that supports the use of technology in PAI learning. PAI teachers also need to make the best use of the available infrastructure and find alternatives or creative solutions if they face infrastructure constraints. In addition, PAI teachers also need to keep up with the latest technological developments and look for relevant and trusted learning resources.

Fourth, Ethical Challenges. The last challenge faced by PAI teachers in using technology is the ethical issues related to the use of technology (Jennings et al., 2019). Ethics here relates to the values, norms, and rules that must be followed by PAI teachers when using technology. Some ethical issues that may arise in the use of technology include plagiarism, copyright, privacy, security, and inappropriate content. PAI teachers must be careful when using technology so as not to violate ethics or applicable laws and not to cause negative impacts on themselves, students, or other parties.

To overcome this challenge, PAI teachers need to have a high level of knowledge and awareness about the ethics of using technology. PAI teachers must follow applicable guidelines or codes of ethics when using technology and respect the rights and responsibilities of all parties involved. PAI teachers must also be selective and critical in choosing and using learning resources derived from technology, as well as ensuring that these learning resources are accurate, valid, and of good quality. In addition, PAI teachers must also educate and supervise students when using technology and set a good example in the use of technology.

In improving the profession, teachers must understand these important things: a. Understand the demands of existing professional standards; b. Achieve the required qualifications and competencies; c. Build good and broad peer relations, including through professional organizations; d. Develop a work ethic or work culture that prioritizes high-quality service to constituents; e. Adopt innovation or develop creativity in the use of the latest communication and information technology in order not to always be left behind in his ability to manage learning (Mustofa, 2012).

This research contributes to the development of Islamic education, especially in the field of professional development for PAI teachers. This research also has implications for Islamic education policies and practices, especially in terms of the use of technology as a learning medium and source of information. This research shows that technology can be a useful and effective tool to improve the professionalism of PAI teachers if used wisely, critically, and responsibly.

This study has several limitations, such as the limited number and characteristics of research subjects, as well as the limited scope and depth of data analysis. Therefore, this research can be further developed using more diverse and comprehensive methods, subjects, and data, as well as by examining other aspects related to the use of technology in the professional development of PAI teachers, such as the impact, effectiveness, and

evaluation of technology use.

Conclusion

This article highlights the importance of the professional development of Islamic Religious Education (PAI) teachers through the use of technology. In the Indonesian context, PAI teachers utilize various types of technology, such as computers, smartphones, and the internet, to find information, communicate, and present learning materials. Technology acts as an effective learning medium and a rich source of information.

The use of technology by PAI teachers offers significant benefits, including increased knowledge, skills, motivation, and creativity. It also expands networks and learning resources. However, challenges such as limited infrastructure, access, cost, and technical support, as well as a lack of teacher readiness and competence, are still obstacles to the use of technology. To address these challenges, the article recommends strategies such as increased availability of technology, teacher training, curriculum development, and standards that support the use of technology. In addition, encouraging a culture of lifelong learning among PAI teachers is considered important to maximize the benefits of technology in learning.

Teachers cannot be replaced because technology is not able to carry out the roles of facilitators, motivators, inspirers, mentors, developers of imagination and creativity, growers of character values, as well as drivers of teamwork and givers of social empathy. Technology is also unable to replace the role of teachers in shaping the character of students. However, teachers are expected to continue to develop their competencies to improve the quality of education in Indonesia by utilizing technology.

References

Al-Zyoud, H. M. M. (2020). The role of artificial intelligence in teacher professional development. *Universal Journal of Educational Research*, *8*(11B). https://doi.org/10.13189/ujer.2020.082265

Angus Cole, K. (2021). Education Brief: Teacher professional development Teacher. *Cambridge Assessment International Education*, 5.

Beardsley, M., Albó, L., Aragón, P., & Hernández-Leo, D. (2021). Emergency education effects on teacher abilities and motivation to use digital technologies. *British Journal of Educational Technology*, *52*(4), 1455–1477. https://doi.org/10.1111/bjet.13101

Beisiegel, M., Mitchell, R., & Hill, H. C. (2018). The design of video-based professional development: An exploratory experiment intended to identify effective features. *Journal of Teacher Education*, *69*(1), 69–89. https://doi.org/10.1177/0022487117705096

Chen, G., Chan, C. K. K., Chan, K. K. H., Clarke, S. N., & Resnick, L. B. (2020). Efficacy of video-based teacher professional development for increasing classroom discourse and student learning. *Journal of the Learning Sciences*, 642–680. https://doi.org/10.1080/10508406.2020.1783269

Engkizar, E., Muliati, I., Rahman, R., & Alfurqan, A. (2018). The Importance of Integrating ICT Into Islamic Study Teaching and Learning Process. *Khalifa: Journal of Islamic Education*, *1*(2). https://doi.org/10.24036/kjie.v1i2.11

Fernández-Batanero, J. M., Montenegro-Rueda, M., Fernández-Cerero, J., & García-Martínez, I. (2022). Digital competences for teacher professional development. Systematic review. *European Journal of Teacher Education*, *45*(4), 513–531. https://doi.org/10.1080/02619768.2020.1827389

Fiantika, F. R. (2022). *Metodologi Penelitian Kualitatif* (Issue March). PT. Global Eksekutif Teknologi.

Gerard, L., Kidron, A., & Linn, M. C. (2019). Guiding collaborative revision of science explanations. *International Journal of Computer-Supported Collaborative Learning*, *14*(3), 291–324. https://doi.org/10.1007/s11412-019-09298-y

Huang, R., Spector, J. M., & Yang, J. (2019). Lecture Notes in Educational Technology Educational Technology A Primer for the 21st Century. *Springer Nature Singapore* .

Imants, J., & Van der Wal, M. M. (2020). A model of teacher agency in professional development and school reform. *Journal of Curriculum Studies*, *52*(1), 1–14. https://doi.org/10.1080/00220272.2019.1604809

Jennings, P. A., Doyle, S., Oh, Y., Rasheed, D., Frank, J. L., & Brown, J. L. (2019). Long-term impacts of the CARE program on teachers' self-reported social and emotional competence and well-being. *Journal of School Psychology*, *76*, 186–202. https://doi.org/10.1016/j.jsp.2019.07.009

Jones, W. M. (2021). Teachers' perceptions of a maker-centered professional development experience: a multiple case study. *International Journal of Technology and Design Education*, *31*(4), 697–721. https://doi.org/10.1007/s10798-020-09581-2

Jujur, I. W. (2023). Upaya Meningkatkan Kinerja Dan Kompetensi Pedagogik Guru Dalam Mengajar Menggunakan Media Pembelajaran. *Jurnal Nalar : Pendidikan Dan Pembelajaran*, *1*(2), 77–85. https://doi.org/10.52232/jnalar.v1i2.9

Kasman, A., Ikhwan, M., & Aziz, D. (2022). Islamic Education as a Strengthening of Aqidah and Akhlaq in The Society 5.0 Era. *Cendekia: Jurnal Kependidikan Dan Kemasyarakatan*, *20*(2), 181–189. https://doi.org/10.21154/cendekia.v20i2.4962

Laurillard, D., Kennedy, E., Charlton, P., Wild, J., & Dimakopoulos, D. (2018). Using technology to develop teachers as designers of TEL: Evaluating the learning designer. *British Journal of Educational Technology*, *49*(6), 1044–1058. https://doi.org/10.1111/bjet.12697

Lie, A., Tamah, S. M., Gozali, I., Triwidayati, K. R., Utami, T. S. D., & Jemadi, F. (2020). Secondary School Language Teachers' Online Learning Engagement During the Covid-19 Pandemic in Indonesia. *Journal of Information Technology Education: Research*, *19*, 803–832. https://doi.org/10.28945/4626

Makovec, D. (2018). The teacher's role and professional development. *International Journal of Cognitive Research in Science, Engineering and Education*, *6*(2), 33–45. https://doi.org/10.5937/ijcrsee1802033M

Mansir, F. (2022). The Position of Islamic Education According to the National Educational System in Indonesia. *Progresiva : Jurnal Pemikiran Dan Pendidikan Islam*, *11*(01). https://doi.org/10.22219/progresiva.v11i01.20416

Marisana, D., Iskandar, S., & Kurniawan, D. T. (2023). Penggunaan Platform Merdeka Mengajar untuk Meningkatkan Kompetensi Guru di Sekolah Dasar. *Jurnal Basicedu*, *7*(1), 139–150. https://doi.org/10.31004/basicedu.v7i1.4363

Masdoki, M., Din, R., & Mohd. Matore, M. E. @ E. (2021). Teaching 4.0 Competency in Higher Learning Institutions: A Systematic Mapping Review. *International Journal of Learning, Teaching and Educational Research*, *20*(10), 217–231. https://doi.org/10.26803/ijlter.20.10.12

Miles, M. B., Huberman, A. M., & Saldana, J. (2019). *Qualitative Data Analysis A Methods Sourcebook* (Fourt Edit). SAGE Publications.

Moleong, L. J. (2018). Metodologi penelitian Kualitatif. *PT Remaja Rosdakarya*.

Mustofa, -. (2012). Upaya Pengembangan Profesionalisme Guru di Indonesia. *Jurnal Ekonomi Dan Pendidikan*, *4*(1). https://doi.org/10.21831/jep.v4i1.619

Muzakki, Z. (2022). Formation of student character in islamic religious education. *EDUKASIA: Jurnal Pendidikan Dan Pembelajaran*.

Nawab, A., Bissaker, K., & Datoo, A. K. (2021). Contemporary trends in professional development of teachers: importance of recognising the context. *International Journal of Educational Management*, *35*(6), 1176–1190. https://doi.org/10.1108/IJEM-10-2020-0476

Nuryana, Z. (2019). Pemanfaatan Teknologi Informasi dalam Pendidikan Agama Islam. *Tamaddun*, *19*(1), 75. https://doi.org/10.30587/tamaddun.v0i0.818

Pelangi, G. (2020). Pemanfaatan Aplikasi Canva Sebagai Media Pembelajaran Bahasa Dan Sastra Indonesia Jenjang SMA/MA. *Jurnal Sasindo Unpam*, *8*(2), 1–18.

Putri Husma, M. J., Shaleh, S., & Handayani, T. (2023). Profil Guru Profesional di Era Industri 5.0. *Al-Madrasah: Jurnal Pendidikan Madrasah Ibtidaiyah*, *7*(2), 672. https://doi.org/10.35931/am.v7i2.2053

Rahman, A. (2016). Islamic Education in the Era of Technological Wave: A Case in Indonesia Today. *Proceeding of International Conference on Islamic Education*, 1–8. https://doi.org/10.51425/icie.vi.14

Romanova, G., Petrenko, L., Romanov, L., Kupriyevych, V., & Antoniuk, L. (2022). Digital Technologies As A Driver of Professional Development of Teachers of Vocational Education Establishments. *Youth Voice Journal*, *4*(SpecialIIssue).

S, M. T., & Riadi, A. (2020). Implikasi Paedagogis Alquran Surat Luqman Ayat 13-19 Tentang Materi Dasar Pendidikan Agama Islam. *Jurnal Penelitian*, *14*(2), 347. https://doi.org/10.21043/jp.v14i2.8139

Schaaf, D. N. (2018). Assistive Technology Instruction in Teacher Professional Development. *Journal of Special Education Technology*, *33*(3), 171–181. https://doi.org/10.1177/0162643417753561

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, *104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Thoifah, I., & Biantoro, S. (2021). Problems and Alternative Solutions for the Implementation of Islamic Education Learning during the Pandemic: A Literature Review. *Progresiva : Jurnal Pemikiran Dan Pendidikan Islam*. https://doi.org/10.22219/progresiva.v10i1.17693

Tuna, M. H. (2022). The professionalisation of Islamic religious education teachers. *British Journal of Religious Education*, *44*(2), 188–199. https://doi.org/10.1080/01416200.2021.1999905

Van Mieghem, A., Verschueren, K., Petry, K., & Struyf, E. (2020). An analysis of research on inclusive education: a systematic search and meta review. In *International Journal of Inclusive Education* (Vol. 24, Issue 6, pp. 675–689). https://doi.org/10.1080/13603116.2018.1482012

Warsita, B.-. (2019). Pemanfaatan Portal Rumah Belajar Untuk Meningkatkan Kualitas Pembelajaran. *Jurnal Teknodik*, *31*(1), 65–78. https://doi.org/10.32550/teknodik.v0i0.355

Willems, I., & Van den Bossche, P. (2019). Lesson Study effectiveness for teachers' professional learning: a best evidence synthesis. In *International Journal for Lesson and Learning Studies* (Vol. 8, Issue 4, pp. 257–271). https://doi.org/10.1108/IJLLS-04-2019-0031

Wright, D. B. (2019). Research Methods for Education With Technology: Four Concerns, Examples, and Recommendations. *Frontiers in Education*, *4*. https://doi.org/10.3389/feduc.2019.00147

Yahya, A. (2022). Pemanfaatan Teknologi Informasi Dalam Pendidikan Agama Islam. *Jurnal Teknologi Dan Bisnis*, *4*(2), 155–162. https://doi.org/10.37087/jtb.v4i2.105

Zubairi, Z., & Nurdin, N. (2022). The Challenges of Islamic Religious Education in the Industrial Revolution 4.0. *Scaffolding: Jurnal Pendidikan Dan Multikultural*, *4*(3).

Zuhaida, A. (2019). Integrative Scientific Madrasah in Indonesia: New Developments in Integrating Science and Religion in the Learning Processes. *Jurnal Ilmiah Islam Futura*, *18*(1), 34. https://doi.org/10.22373/jiif.v18i1.2868