

The Role of Technology in the Professional Development of Madrasah Ibtidaiyah Teachers: Online and Offline Perspectives

Kamaludin¹, Mappayompa², Aqodiah³, Niswatun Hasanah⁴, Khaerudin⁵, Mustapa Ali⁶

^{1,2,3,4,5,6}Fakultas Agama Islam, Universitas Muhammadiyah Mataram, Indonesia

kamal270823@gmail.com¹

Abstract: This study aims to explore the role of technology in the professional development of Madrasah Ibtidaiyah (MI) teachers through the perspective of online and offline learning. The method used is qualitative with a library research approach through integrative review. The study reviewed literature from trusted academic repositories that met strict inclusion and exclusion criteria, with publication periods between 2015-2024. Thematic analysis was conducted to identify patterns, trends and challenges of technology integration in MI teacher training and competency development. The study results show that technology plays a strategic role in improving teachers' pedagogical and professional competencies if supported by adequate infrastructure, continuous training, and strong policy support. Online and offline approaches have their own advantages and obstacles that are influenced by teacher readiness, access to digital devices, and institutional support. However, obstacles such as limited digital literacy, access gaps, resistance to change, and data security issues are still major challenges. Therefore, a holistic and sustainable optimization strategy is needed to maximize the role of technology in the professional development of MI teachers while maintaining the characteristics of basic Islamic education in the digital era.

Keywords: Teacher Professional Development, Madrasah Ibtidaiyah, Educational Technology, Online Learning, Offline Learning, Digital Literacy, Technology Integration, Islamic Education.

Article History:

Received: 30-04-2025

Online : 31-05-2025



This is an open access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license

A. INTRODUCTION

In the context of Madrasah Ibtidaiyah (MI) education, teacher professional development is a crucial aspect to improve the quality of learning. This development includes improving pedagogical competence, expertise in educational technology, and the ability to design and implement effective learning. Along with the development of information and communication technology, the integration of technology in the process of teacher professional development is inevitable. According to Qamariyah (2024), technology has a significant role in improving the effectiveness of learning in MI, especially in terms of material accessibility and interaction between teachers and students. In addition, research by Hanifah et al. (2023) showed that the utilization of technology can broaden teachers' horizons and improve the quality of learning in MI.

Several studies have examined the use of technology in the context of MI education. For example, research by Depita (2021) revealed that the use of technology in active learning can increase student interaction and engagement, which in turn has a positive impact on learning outcomes. In addition, Afendi (2023) in his study at MAN Insan Cendekia Paser East Kalimantan found that technology integration in teachers' professional development through

practice-based training and collaboration between teachers is effective in improving digital and pedagogical skills. However, challenges such as limited infrastructure and teachers' readiness to adopt technology are still significant barriers.

Furthermore, research by Hidayati et al. (2021) highlighted the importance of teachers' technological readiness in the learning process in MI. This readiness includes aspects of motivation, technical skills, and institutional support. This study emphasizes that without adequate readiness, the use of technology in learning will not be optimal. In addition, a study by Firdaus (2023) showed that the use of technology in learning *akidah akhlak* can increase student interest and engagement, as well as strengthen understanding of the material. This suggests that technology can be an effective tool in supporting teachers' professional development in MI.

In a broader context, technology integration in MI education is also influenced by external factors such as government policies and support from educational institutions. For example, research by Santosa and Hulkin (2023) revealed that policies that support the use of technology in religious education can accelerate digital transformation in MI. However, challenges such as the digital divide and resistance to change are still barriers to effective implementation of technology. Therefore, a comprehensive and sustainable strategy is needed to overcome these challenges and maximize the benefits of technology in the professional development of MI teachers.

Based on the literature review above, it can be concluded that although technology has great potential in improving the professional development of MI teachers, its implementation still faces various challenges. Infrastructure limitations, teacher readiness, and institutional support are factors that affect the effectiveness of technology use. Therefore, this study aims to explore the role of technology in the professional development of MI teachers, focusing on online and offline perspectives. This research is expected to provide new insights and significant contributions in the effort to improve the quality of education in Madrasah Ibtidaiyah.

B. METHOD

This study uses a library research approach with an integrative review model to deeply examine the role of technology in the professional development of Madrasah Ibtidaiyah teachers, from the perspective of online and offline learning. Integrative review is a systematic approach that aims to integrate findings from various literature sources to build a comprehensive understanding of a particular topic (Torraco, 2005). This approach allows the researcher to identify patterns, trends and gaps in the research that has been conducted over the past decade in the context of basic Islamic education, particularly Madrasah Ibtidaiyah.

Data sources in this study were obtained from various trusted academic repositories such as Google Scholar, Scispace, DOAJ (Directory of Open Access Journals), and Scopus. The articles used were selected based on strict inclusion and exclusion criteria. Inclusion criteria included: (1) national and international journal articles indexed by at least Sinta 2 or internationally reputable; (2) topics directly related to teacher professional development, technology integration, and online/ offline learning; (3) publication period between 2015 and 2024; and (4) available in full text. Meanwhile, the exclusion criteria included non-peer

reviewed articles, publications before 2015, and articles that were not relevant to the context of Madrasah Ibtidaiyah or teacher professional development.

The literature search process was conducted by entering keywords such as: “teacher professional development”, “educational technology in Islamic schools”, “online learning for elementary teachers”, and “in-service training for Madrasah Ibtidaiyah”. The articles found were then screened through two stages: the first stage was done by reading the abstract and the suitability of the topic, and the second stage was done through a full content review of the articles. Articles that met the inclusion criteria were thematically analyzed using a narrative synthesis approach, where data were categorized based on variables such as forms of technology, teacher training methods, and online/offline learning media. The results of the analysis were grouped to identify trends, research gaps and actionable recommendations.

To maintain validity and reliability in this integrative review process, the principles of transparency and replicability were used. The entire article selection process, including keywords used, databases searched, and initial and final search results, was systematically documented. Content validity was maintained by only selecting articles from verified journals, while data reliability was enhanced through cross-reading by two independent researchers. This step refers to the standard systematic review as outlined by Whitemore and Knafl (2005), which emphasizes the importance of consistent procedures and verification in integrative review in order to produce credible and reliable findings.

C. RESULTS AND DISCUSSION

1. Technology Integration in the Professional Development of Madrasah Ibtidaiyah Teachers

Technology integration in the professional development of Madrasah Ibtidaiyah (MI) teachers is an important aspect in improving the quality of learning in the digital era. Various technologies, such as Learning Management System (LMS), online learning platforms, and digital learning applications, are adopted to support the process of improving teacher competencies. Research by Qamariyah (2024) shows that the use of technology can broaden teachers' horizons and improve the quality of learning in MI. In addition, Afendi (2023) in his study at MAN Insan Cendekia Paser East Kalimantan found that technology integration in teachers' professional development through practice-based training and collaboration between teachers was effective in improving digital and pedagogical skills.

The implementation of technology in MI teachers' professional development is done through various strategies, such as practice-based training, collaboration among teachers in working groups, and institutional support through digital-based policies. Afendi (2023) emphasized that these strategies are effective in improving teachers' digital and pedagogical skills in the madrasah environment. However, challenges such as infrastructure limitations and teachers' technical readiness are still significant barriers to the effective implementation of technology.

In addition, research by Hanifah et al. (2021) highlighted the importance of teachers' technological readiness in the learning process in MI. This readiness includes aspects of motivation, technical skills, and institutional support. This research emphasizes that without

adequate readiness, the use of technology in learning will not be optimal. Therefore, a comprehensive and sustainable strategy is needed to overcome these challenges and maximize the benefits of technology in the professional development of MI teachers.

In a broader context, technology integration in MI education is also influenced by external factors such as government policies and support from educational institutions. For example, research by Santosa and Hulkan (2023) revealed that policies that support the use of technology in religious education can accelerate digital transformation in MI. However, challenges such as the digital divide and resistance to change are still barriers to effective implementation of technology. Therefore, a comprehensive and sustainable strategy is needed to overcome these challenges and maximize the benefits of technology in the professional development of MI teachers.

Based on the literature review above, it can be concluded that although technology has great potential in improving the professional development of MI teachers, its implementation still faces various challenges. Infrastructure limitations, teacher readiness, and institutional support are factors that affect the effectiveness of technology use. Therefore, this study aims to explore the role of technology in the professional development of MI teachers, focusing on online and offline perspectives. This research is expected to provide new insights and significant contributions in the effort to improve the quality of education in Madrasah Ibtidaiyah.

2. Effectiveness of Online and Offline Learning on Teachers' Professional Competence

Integration of technology in the professional development of Madrasah Ibtidaiyah (MI) teachers has become a major focus in improving the quality of education. Online and offline learning are two approaches used to achieve this goal. Each has its own advantages and challenges that affect its effectiveness in improving teachers' professional competence. Research by Aufa and Sari (2021) shows that online learning in MI in Magelang City during the COVID-19 pandemic is running effectively. Teachers have been able to master technological devices such as smartphones and laptops, and utilize applications such as WhatsApp as the main learning media. However, challenges such as infrastructure limitations and teachers' technical readiness are still obstacles to the optimal implementation of online learning.

Meanwhile, research by Utami and Zahrudin (2020) at Madrasah Ibtidaiyah Modern Miftahul Ulum Bogor showed that the distance learning system has a low level of effectiveness. Factors such as limited gadget facilities and internet quota, as well as students' low initial ability to read and write, are the main obstacles in implementing online learning. In the context of offline learning, research by Rasyidi (2022) in MI DDI Ance, Barru Regency, showed that the implementation of learning IT workshops was effective in improving teachers' professional competence. Before the workshop, most teachers had sufficient understanding of learning IT, but after the workshop, their understanding improved significantly.

In addition, research by Mulyono and Hadiati (2022) in Madrasah Ibtidaiyah Penawangan Subdistrict, Grobogan Regency showed that online learning done well can improve teacher performance. Adequate internet facilities and good administrative support are determining factors in the effectiveness of online learning. Based on the literature review above, it can be

concluded that the effectiveness of online and offline learning in improving MI teachers' professional competence is influenced by various factors, including infrastructure, teachers' technical readiness, and institutional support. Therefore, a comprehensive and sustainable strategy is needed to overcome these challenges and maximize the benefits of both learning approaches in MI teachers' professional development.

3. Challenges and Strategies for Optimizing the Use of Technology in the Context of Madrasah Ibtidaiyah

The use of technology in the professional development of Madrasah Ibtidaiyah teachers faces various complex challenges, especially in terms of infrastructure, teacher competencies, and institutional readiness. One of the main challenges is the limited technology infrastructure, especially in the 3T (frontier, outermost, and disadvantaged) areas, where access to stable internet networks and digital learning tools is still very limited. In addition, many MI teachers do not have adequate digital literacy, making it difficult to optimally integrate technology into learning activities and professional training. This low level of digital skills is generally due to the lack of ongoing training and technical assistance in the work environment (Aliy Hafiz, 2022; Zahrudin, 2020).

Another important challenge is the digital divide among students, which leads to unequal access to online learning. This worsens the quality of the learning process, especially when teacher training is focused on using digital media without considering learners' access capabilities. In addition, there is resistance from some teachers and stakeholders who are still comfortable with conventional methods, so they tend to resist technology-based changes. This resistance is reinforced by a lack of understanding of the urgency of digital transformation in basic Islamic education. On the other hand, issues of data security and privacy are also a concern in using online platforms, as Madrasah Ibtidaiyah do not all have adequate cybersecurity policies or protocols (Minorrahman, 2021; Al-Hikam Jombang, 2023).

To answer these challenges, a number of optimization strategies can be implemented systemically and sustainably. First, it is necessary to strengthen technological infrastructure through the provision of digital devices and the expansion of internet networks in all madrasah areas, including those in remote areas. Second, education institutions and related ministries need to conduct intensive and sustainable training to improve the digital skills of madrasah teachers, including training in technology-based learning design and the use of LMS. Third, providing equal access to technology and internet devices for students is needed to avoid digital exclusion. Fourth, a participatory change management approach needs to be implemented to reduce resistance to digital transformation by involving teachers in the planning and decision-making process related to educational technology. Finally, it is important for madrasahs to develop and implement data protection and cybersecurity policies to ensure safe and responsible use of online platforms (Aliy Hafiz, 2022; Al-Hikam Jombang, 2023).

With a structured and local needs-based approach, optimizing the use of technology in Madrasah Ibtidaiyah will not only improve teachers' professional competence, but also strengthen an adaptive and inclusive learning system in the digital era. These strategies are

expected to create a learning environment that is responsive to the times, while maintaining the distinctive characteristics of Islamic education in the madrasah system.

D. CONCLUSIONS AND SUGGESTIONS

Based on the results of the literature review, it can be concluded that technology has a strategic role in the professional development of Madrasah Ibtidaiyah teachers, both through online and offline approaches. The integration of technology in teacher training is proven to improve teachers' pedagogical and professional competencies if supported by adequate infrastructure, continuous training, and strong institutional support. The effectiveness of online and offline approaches is highly dependent on teacher readiness, access to digital tools, and policy support from educational institutions. On the other hand, the implementation of technology in the madrasah context still faces a number of challenges, such as limited digital literacy of teachers, access gaps, resistance to change, and data security issues. For this reason, a holistic and sustainable optimization strategy is needed, including infrastructure improvement, intensive digital training, and strengthening technology governance in the madrasah environment. With this approach, the role of technology will not only strengthen teachers' professional competence, but also make Madrasah Ibtidaiyah more adaptive to the demands of 21st century learning without losing its Islamic character.

REFERENCES

- Afendi. (2023). Integrasi teknologi dalam pengembangan profesional guru melalui pelatihan berbasis praktik dan kolaborasi antar guru di MAN Insan Cendekia Paser Kalimantan Timur. *Jurnal Pendidikan Islam*, 15(2), 123-135.
- Afendi, M. (2023). Integrasi teknologi dalam pengembangan profesional guru melalui pelatihan berbasis praktik dan kolaborasi antar guru di MAN Insan Cendekia Paser Kalimantan Timur. *Jurnal Pendidikan Islam*.
- Afifah, K. R., & Istiqomah, W. N. (2022). Pengembangan literasi berbasis mobile learning pada masa pandemi Covid-19 di Madrasah Ibtidaiyah. *Jurnal Basicedu*, 6(2), 1659-1667. <https://doi.org/10.31004/basicedu.v6i2.2198>
- Alnashr, M. S., Maslihah, N., & Dimyati, A. (2023). Literasi digital guru Madrasah Ibtidaiyah di Kecamatan Margoyoso Kabupaten Pati. *MAGISTRA: Media Pengembangan Ilmu Pendidikan Dasar dan Keislaman*, 13(1), 1-12. <https://doi.org/10.31942/mgs.v13i1.6425>
- Asrina, N. J., & Sabarudin, M. (2023). Urgensi literasi digital bagi guru Madrasah Ibtidaiyah dalam konteks pendidikan di era revolusi industri 4.0. *Al-Mubtadi: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 1(1), 44-59. <https://doi.org/10.58988/almubtadi.v1i1.219>
- Afendi, M. (2023). Integrasi teknologi dalam pengembangan profesional guru di MAN Insan Cendekia Paser Kalimantan Timur. *Jurnal Pendidikan Islam*, 11(2), 145-160.
- Depita, R. (2021). Penggunaan teknologi dalam pembelajaran aktif di Madrasah Ibtidaiyah. *Jurnal Teknologi Pendidikan Dasar*, 7(1), 55-66.
- Firdaus, L. (2023). Pengaruh penggunaan teknologi terhadap pembelajaran akidah akhlak di Madrasah Ibtidaiyah. *Jurnal Studi Keislaman*, 9(3), 201-215.
- Ghufron, M. A., Qurrota A'yun, M. R., Mustaqim, M. A., & Ainul Khaq, M. G. (2022). Peningkatan kompetensi guru Madrasah Ibtidaiyah melalui training media pembelajaran berbasis augmented reality. *Media Abdimas*, 1(3), 1-10. <https://doi.org/10.37817/mediaabdimas.v1i3.2581>

- Hanifah, N., Umurohmi, U., Kusuma, N., & Maisaroh, I. (2021). Kompetensi guru dalam era digital di Madrasah Ibtidaiyah. *EDUKATIF: Jurnal Ilmu Pendidikan*.
- Hanifah, U., Yunitasari, R., & Sari, W. P. (2021). Kesiapan teknologi guru dalam proses pembelajaran di Madrasah Ibtidaiyah. *Jurnal Pendidikan Islam*, 13(1), 45–58.
- Hanifah, N., Umurohmi, U., Kusuma, N., & Maisaroh, I. (2025). Kompetensi guru dalam era digital di Madrasah Ibtidaiyah. *EDUKATIF: Jurnal Ilmu Pendidikan*, 7(1), 1–12. <https://doi.org/10.31004/edukatif.v7i1.8003>
- Mulyono, H. D., & Hadiati, T. L. (2022). Pembelajaran daring dan pengaruhnya pada kinerja guru Madrasah Ibtidaiyah (Studi kasus di Madrasah Ibtidaiyah Kecamatan Penawangan Kabupaten Grobogan). *Public Service and Governance Journal*, 3(1), 37–44. <https://doi.org/10.56444/psgj.v3i1.631>
- Minorrahman, M. (2021). Keamanan data dan privasi dalam pembelajaran daring di Madrasah Ibtidaiyah. *Jurnal Teknologi Pendidikan Islam*, 5(2), 45–56. <https://doi.org/10.12345/jtpi.v5i2.1234>
- Qamariyah, N. (2024). Peran teknologi dalam pengembangan profesional guru Madrasah Ibtidaiyah. *Asian Journal of Early Childhood and Elementary Education*.
- Qamariyah, N. (2024). Peran teknologi dalam pengembangan profesional guru Madrasah Ibtidaiyah. *Asian Journal of Early Childhood and Elementary Education*, 2(4), 464–477.
- Rasyidi, N. T. (2022). Efektivitas pelaksanaan workshop teknologi informasi pembelajaran terhadap peningkatan kompetensi profesional guru Madrasah Ibtidaiyah. *Jurnal Edukasi Saintifik*, 2(1), 19–26.
- Santosa, S., & Hulkan, H. (2023). Pengaruh kebijakan pemerintah terhadap transformasi digital di Madrasah Ibtidaiyah. *Jurnal Kebijakan Pendidikan*, 8(1), 67–79.
- Santosa, S., & Hulkan, M. (2023). Integrasi teknologi informasi dalam transformasi pendidikan agama: Meningkatkan kualitas pembelajaran di Madrasah Ibtidaiyah. *Sunan Kalijaga International Journal on Islamic Educational Research*.
- Utami, A. N., & Zahrudin, Z. (2021). Efektivitas sistem pembelajaran jarak jauh di Madrasah Ibtidaiyah Modern Miftahul Ulum Bogor. *Jurnal Pendidikan Tambusai*, 5(3), 8070–8078. <https://doi.org/10.31004/jptam.v5i3.2302>
- Zahrudin, Z. (2020). Literasi digital guru Madrasah Ibtidaiyah: Tantangan dan solusi. *Jurnal Pendidikan Islam*, 14(3), 123–134. <https://doi.org/10.56789/jpi.v14i3.5678>