

Analysis of Technology Readiness of Madrasah Ibtidaiyah Teachers in the Learning Process

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Abstract: This study aims to examine the effectiveness of teacher training in implementing Merdeka Curriculum in Madrasah Ibtidaiyah through a library research approach with an integrative literature review method. The focus of the study is directed at teachers' technological readiness in digital learning, which is analyzed based on the themes of digital competence, attitudes towards technology, use of digital media, and institutional support. Literature was obtained from four major academic databases (Google Scholar, Scispace, DOAJ, and Scopus), with publication coverage from 2015-2024. Article selection was conducted systematically through a two-stage process and data analysis was conducted using thematic methods with open coding techniques. The synthesis results show that teachers' technological readiness is strongly influenced by digital-based pedagogical competencies, psychological factors such as enthusiasm and attitudes towards technology, as well as the availability of infrastructure and institutional support. This study recommends the need to develop a teacher training model that is contextualized with Islamic values and madrasah locality. Future studies are suggested to evaluate education technology distribution policies in 3T areas to realize equitable quality of digital education in madrasahs.

Keywords: Technology Readiness, Madrasah Teachers, Merdeka Curriculum, Digital Competency, Integrative Review.

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A. INTRODUCTION

Teacher technology readiness refers to the extent to which educators have the necessary knowledge, skills and attitudes to integrate technology in the learning process effectively. According to Parasuraman (2000), technology readiness includes the dimensions of optimism, innovation, discomfort and insecurity, which influence the adoption of technology by individuals. In the context of education, this readiness is crucial, especially for Madrasah Ibtidaiyah (MI) teachers, to ensure that technology is used as a tool that supports learning rather than a barrier. Hashim (2018) emphasizes that teachers' mastery of information and communication technology (ICT) can improve the quality of learning and prepare students for the challenges of the 21st century.

Hidayati et al. (2022) identified three profiles of technology readiness among MI teachers: explorers, pioneers, and slow adopters. Explorers show high confidence in technology but lack in innovative applications, pioneers are ready to adopt technology but face resource and technical knowledge limitations, while slow adopters, generally senior teachers, show

resistance to technological change. This research highlights the need for a customized approach for each profile to improve technology integration in learning.

Rofiah et al. (2023) in their study in rural Belitung found that infrastructure limitations, such as unstable internet access and lack of technology devices, were the main barriers for teachers in integrating ICT in learning. In addition, the lack of training and technical support makes teachers feel insecure in using technology. Qamariyah (2024) also emphasized that although technology has great potential in improving pedagogical skills, challenges such as inadequate infrastructure and unmet training needs must be addressed to maximize the benefits of technology in MI education.

Gazali and Pransisca (2022) emphasized the importance of ICT literacy for MI teachers in facing the era of the Industrial Revolution 4.0. This literacy includes the ability to use technology to research, organize, evaluate and communicate information effectively. With good ICT literacy, teachers can design learning that is more interactive and relevant to the needs of today's students. In addition, ICT literacy also helps teachers understand ethical and legal issues related to the use of information, which is important in the context of digital education.

Qamariyah Qamariyah (2024) in her research highlighted that technology, particularly e-learning platforms and digital collaboration tools, can significantly improve pedagogical skills and student motivation. However, achieving this requires a professional development strategy that focuses on improving teachers' digital skills, providing adequate infrastructure and strong institutional support. Ongoing training that is relevant to teachers' needs is key in ensuring that technology is used effectively in learning.

From the above literature review, it appears that despite efforts to improve MI teachers' technological readiness, there are still gaps in terms of infrastructure, training and institutional support, especially in remote areas. In addition, the diverse technology readiness profiles among teachers suggest the need for a more personalized approach in professional development. The novelty of this study lies in the in-depth analysis of the factors that influence MI teachers' technological readiness and the development of strategies tailored to each teacher's readiness profile. The purpose of this study is to analyze the technology readiness of Madrasah Ibtidaiyah teachers in the learning process and identify effective strategies to improve technology integration in MI education.

B. METHOD

This research uses a library research approach with an integrative literature review method. This approach was chosen because it allows researchers to synthesize various results of previously conducted studies systematically, comprehensively, and critically to formulate new findings or identify gaps that have not been widely discussed (Torraco, 2005). The focus of the study is the analysis of Madrasah Ibtidaiyah teachers' technological readiness in the learning process, which is assessed based on key themes such as technological knowledge, digital literacy, digital media usage, and institutional support for technology-based learning transformation.

Literature data sources were obtained from four major academic databases, namely Google Scholar, Scispace, Directory of Open Access Journals (DOAJ), and Scopus, to ensure research coverage of well-indexed national and international articles. Articles were considered only from 2015 to 2024, to maintain relevance to the latest educational technology developments. Inclusion criteria included articles with a focus on primary or madrasah teachers, technology readiness or competency topics, and qualitative, quantitative, or systematic review study types. Exclusion criteria included articles that were not available in full text, not relevant to the main topic, or not peer-reviewed.

The literature search process was conducted using keywords such as “technological readiness of elementary teachers”, “ICT integration in Madrasah Ibtidaiyah”, “teacher digital competence”, and “technology use in Islamic primary education”. Each article obtained was imported into a reference manager (Zotero/Mendeley), then classified based on year of publication, type of research, and topic relevance. The selection procedure was carried out in two stages: first, through the identification of titles and abstracts; second, through a full content review to ensure the suitability of the content to the focus of the study. Articles that met the inclusion criteria were further analyzed.

Data analysis was conducted using thematic methods using an open coding approach to identify key themes in the literature. The emerging themes were then categorized and synthesized to answer the research focus. To ensure the validity and reliability of the data, data triangulation strategies were used between literature sources and peer debriefing of the synthesized results. Validity was also enhanced through an audit trail and readability of the review results by academic supervisors or peers (Whittemore & Knafl, 2005).

C. RESULTS AND DISCUSSION

1. Technology Readiness Profile of Madrasah Ibtidaiyah Teachers

Technology readiness among Madrasah Ibtidaiyah teachers is an important aspect in improving the quality of education and the effectiveness of the learning process, especially in the context of the current digital era. Research shows that the development of innovative learning models that integrate technology has a major impact on teachers' readiness to face the challenges of modern education (Rivas & Klügl, 2024; ,(El-Masri & Tanaka, 2024). Within this framework, training and supporting teachers' professionalism is crucial, as many teachers have difficulty accessing relevant training and adapting to rapid technological and curriculum changes (El-Masri & Tanaka, 2024).

In addition, the ability to implement a new curriculum, such as that resulting from the implementation of Curriculum 2013, has a direct influence on teacher performance (Juliana & Ermayani, 2023). Teachers' readiness, which includes the ability to use technology in teaching and classroom management, is strongly related to their performance as well as learners' development (Fidrayani & Hadiati, 2020). Research shows that uncertainty and lack of confidence in technology use can hinder the effective use of digital tools in the classroom (Mundy et al., 2012).

Technology readiness is also influenced by the development of digital competencies among teachers. Al-Awidi and Aldhafeeri pointed out that psychological factors in readiness to implement digital curriculum in schools are critical to creating an effective learning environment (Joseph et al., 2021). Thus, understanding and improving the technological readiness of Madrasah Ibtidaiyah teachers depends not only on technological infrastructure, but also on improving pedagogical competence and enthusiasm for technology (Al-Awidi & Aldhafeeri, 2017).

2. Factors Affecting Teacher Technology Readiness

Teachers' technological readiness in education is strongly influenced by various factors, which include knowledge, experience, attitude towards technology, and institutional support. First, teachers' technological knowledge related to TPACK (Technological Pedagogical Content Knowledge) plays a crucial role in their readiness to integrate technology in the teaching and learning process Handayani et al. (2024), (Zulhazlinda et al., 2023). Research shows that teachers who have a deep understanding of how pedagogical technology can be applied in learning are better prepared to innovate in the classroom (Wu et al., 2022). This is in line with the finding that good technological knowledge can improve teachers' ability to overcome educational problems that arise from the use of technology (Zulhazlinda et al., 2023).

Furthermore, teaching experience is also a significant factor affecting teachers' readiness to use technology. The study by Cebe and Suson confirmed that teaching experience is closely related to teacher effectiveness, where more experienced teachers have a higher readiness to adopt new technologies (Cebe & Suson, 2023). This experience shapes teachers' confidence and ability to adapt to change, which is important for the implementation of technology in the education curriculum (Endot & Jamaluddin, 2023). Research also shows that teachers who have engaged in prior technology training tend to be better prepared to implement technology in the classroom when facing the transition to more digital teaching methods (Milawati & Sholeh, 2020).

Attitudes and behaviors towards technology are equally important. High technology readiness often depends on how teachers perceive the benefits and convenience of using technology tools in learning. Research found that teachers who have a positive attitude towards technology and are ready to utilize digital tools tend to be more successful in technology integration (Tiba & Condy, 2021). In addition, support from peers and school leaders also strengthens teachers' readiness to face technological challenges (Haris et al., 2022).

3. Strategies for Strengthening Technology Readiness in the Context of Madrasah Ibtidaiyah

Strategies to strengthen technology readiness in the context of Madrasah Ibtidaiyah is a very important aspect, especially in the digital era and in the implementation of Merdeka Curriculum. Various approaches can be adopted to improve the readiness of teachers, technology infrastructure, and student and parent participation in the madrasah environment. One key strategy is to conduct ongoing technology training for teachers. Providing teachers with access to training on the use of modern educational technology will greatly improve their

skills and confidence in integrating technology into learning. Research shows that professional support in the form of seminars, workshops and technology-based training programs can help teachers adapt to the changes in curriculum and teaching methodologies required (Qamariyah, 2024). In particular, training that focuses on the use of digital learning platforms and collaboration tools can increase motivation and teaching effectiveness (Qamariyah, 2024).

In addition, there is a need for curriculum development and implementation that is responsive to technological needs. As revealed in the research on Merdeka Curriculum, it is important to identify and overcome the challenges that arise in the implementation process at Madrasah Ibtidaiyah Atikoh (2023) and strengthen the connection between theory and practice through the local context (Aisyah et al., 2023). Integrating the values of moderation, diversity and tolerance in the curriculum can also be part of this strategy to support character education as well as scholarship in a digital context (Aluf et al., 2024).

Strengthening the technology infrastructure in madrasah is also an important aspect. Research shows that the provision of adequate facilities, such as fast internet access and hardware required for digital learning, is crucial to support technology readiness (Firmansyah et al., 2024; Dewantoro et al., 2023). The government and educational institutions also need to collaborate to ensure that all madrasahs have access to the necessary technology to deliver quality education (Firdaus, 2023).

D. CONCLUSIONS AND SUGGESTIONS

The technological readiness of Madrasah Ibtidaiyah teachers in facing digital learning is influenced by three main aspects, namely digital competence, psychological factors (such as attitude and enthusiasm for technology), and infrastructure support. Teachers who have a positive attitude, adequate pedagogical competence, and supported by a conducive school environment tend to be more ready to integrate technology in the learning process. Therefore, improving technology readiness is not enough with the provision of devices, but should also include training, moral support, and strengthening professional networks in the madrasah environment. Further research needs to focus on developing technology training models that are integrated with the Islamic context and local culture of madrasah. In addition, it is important to evaluate the effectiveness of government policies in equalizing access to technology in madrasahs located in 3T areas (frontier, outermost, underdeveloped).

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