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Professional Competence of Madrasah Teachers in the Digital Era: Utilizing Artificial Intelligence to Develop Islamic Learning Media at MTs Miftahul Jannah

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ABSTRACT

The development of digital technology, particularly artificial intelligence (AI), requires madrasah teachers to have adaptive professional competence in developing contextual learning media that embody Islamic values. Teachers at MTs Miftahul Jannah still face limitations in digital literacy, understanding of how to use AI, and skills in designing innovative learning media. This community service program aims to describe the process and outcomes of strengthening teachers' professional competence through training and mentoring in the use of AI to develop Islamic learning media. The activity used a descriptive qualitative approach with a participatory method involving 20 teachers. The implementation stages included observation and needs analysis, training, hands-on media development practice, mentoring, and reflection. Data were collected through observation, interviews, documentation, and analysis of media products, then analyzed through data reduction, data display, and conclusion drawing, with source and technique triangulation to ensure data validity. The results show changes in three aspects: improved teacher understanding of the wise and ethical use of AI, growing skills and confidence in designing learning media, and the creation of Islamic learning media products that are ready for classroom use. These findings indicate that training based on hands-on practice and continuous mentoring can strengthen the professional competence of madrasah teachers in the digital era.

Keywords *Teacher Professional Competence, Artificial Intelligence, Islamic Learning Media.*

INTRODUCTION

Teachers are the main determinant of learning quality, so their professional competence must continue to develop in line with changing times (Law Number 14 of 2005). The development of digital technology, particularly generative artificial intelligence (AI) such as ChatGPT, Canva AI, and Gemini, is now changing the way teachers design materials, develop media, and assess learning outcomes. UNESCO emphasizes that generative AI opens up great opportunities for education, but its use must be guided by a human-centered approach and by teachers' ability to use it critically and ethically (Miao & Holmes, 2023).

This challenge is more complex for madrasah teachers. In addition to mastering technology, madrasah teachers must ensure that learning media

remain academically accurate in terms of Islamic knowledge and consistent with Islamic values. The Technological Pedagogical Content Knowledge (TPACK) framework explains that the effective use of technology requires the integration of technological, pedagogical, and content knowledge (Mishra & Koehler, 2006). In this context, "content" refers to Islamic subject matter that must not be wrong.

Based on initial observations at MTs Miftahul Jannah, the use of technology in the learning process still needs to be improved, particularly the use of digital and artificial intelligence (AI)-based learning media. Teachers still tend to use conventional learning media, such as textbooks, whiteboards, and the lecture method. Interactive and innovative digital media have not been used optimally to support the learning process, particularly in Islamic Religious Education (PAI) subjects.

In addition, teachers' understanding of the use of AI as a tool for developing learning media still needs to be improved. Teachers need the knowledge and skills to use AI technology to prepare materials, create presentation materials, develop Islamic illustrations, and present learning materials that are engaging and suited to students' needs.

Another problem is the importance of teachers' ability to verify the information and Islamic content generated by AI. AI-generated content is not necessarily entirely correct or consistent with the sources of Islamic teachings. Therefore, teachers need guidance for checking the accuracy of Qur'anic verses, hadith, translations, and Islamic explanations against trusted sources before using them in learning.

Based on these conditions, efforts are needed to improve the professional competence of teachers at MTs Miftahul Jannah through the introduction of, and training in, the use of AI in developing Islamic learning media. This activity is expected to help teachers develop learning media that are more creative, interactive, and relevant to technological developments, without neglecting the accuracy of the material, Islamic values, and learning objectives. This condition indicates a gap between the demands on teachers' professional competence in the digital era and the capacity currently available.

A number of studies have examined AI in Islamic learning and the development of teacher competence. Nurhayati et al. (2024) concluded, through a literature review, that AI can tailor materials to students' needs, automate teachers' administrative tasks, and increase learning motivation in Islamic Religious Education. Junaidi and Mawi (2025) used a descriptive qualitative approach in madrasah tsanawiyah and found that the use of ChatGPT, Quizizz AI, and Gemini in Fiqh learning made learning more interactive. They also

noted challenges in the form of teachers' digital literacy, the validity of scholarly sources, and balancing the use of AI with Islamic values. From the community service perspective, Hasan et al. (2026) reported that AI training for secondary school teachers improved their ability to use ChatGPT, Canva AI, and Gamma AI, while Wandria et al. (2026) reported an improvement in teachers' digital competence through ChatGPT-based training at MTs Al-Mujtahadah Pekanbaru. A systematic review by Ren and Wu (2025) in the higher education context confirmed that AI integration competence encompasses AI literacy, innovative pedagogy, and the design of learning experiences. That review also warned of the digital divide and ethical issues.

Nevertheless, these studies have not addressed the specific needs of madrasah teachers. Nurhayati et al. (2024) is conceptual in nature, and Junaidi and Mawi (2025) describe AI usage practices without any intervention to develop teacher competence. The training in Hasan et al. (2026) and Wandria et al. (2026) focused on technical skill outcomes or general digital competence, without examining in depth how teachers verify the accuracy of Islamic content. The experiences of madrasah teachers in the process of using AI, including how they weigh accuracy and Islamic values, have also rarely been studied qualitatively. The novelty of this activity lies in: (1) integrating mentoring in the use of AI with the development of Islamic learning media that requires validation of content and Islamic values; (2) using the TPACK framework as a lens to analyze in depth the development of madrasah teachers' professional competence based on their real experiences and products; and (3) focusing on a single partner madrasah, namely MTs Miftahul Jannah, as a contextual illustration that can serve as a reference for other madrasahs. *(Note: this novelty claim is based on my search of the literature available online. You should double-check it on Google Scholar or Garuda before submitting.)*

Based on the above description, this activity aims to describe and analyze the development of the professional competence of teachers at MTs Miftahul Jannah in using AI to develop Islamic learning media. This activity is important because this competence determines whether AI will enrich learning or instead spread inaccurate religious content. The focus of the study covers: (1) teachers' understanding and literacy of AI; (2) teachers' practices in designing AI-assisted Islamic learning media; (3) how teachers verify the accuracy and value-appropriateness of Islamic content; and (4) the obstacles and supporting factors experienced by teachers. The activity was carried out using a descriptive-participatory qualitative approach with 24 teachers in July 2026, through the stages of observation, training, hands-on practice (learning by doing),

mentoring, and reflection, with data collected through observation, interviews, focus group discussions, and documentation.

Terms and abbreviations: AI stands for artificial intelligence; MTs stands for Madrasah Tsanawiyah (equivalent to junior high school); PKM stands for *Pengabdian kepada Masyarakat* (Community Service); TPACK stands for Technological Pedagogical Content Knowledge; Islamic learning media refers to teaching media whose content is in line with Islamic teachings and values.

RESEARCH METHODS

This community service activity used a descriptive qualitative approach with a participatory method, which positions teachers as active subjects at every stage of the activity through the principle of learning by doing (Kolb, 1984; Hasan et al., 2026). A qualitative approach was chosen because this activity aimed to understand the processes, experiences, obstacles, and changes in teachers' practices in using AI, which cannot be sufficiently explained by numbers. The activity was carried out at MTs Miftahul Jannah, Pantai Cermin Village, Tanjung Pura District, Langkat Regency, over 8 meetings from 1–31 August 2026.

The subjects of the activity were teachers at MTs Miftahul Jannah. Informants were selected using purposive sampling with the following criteria: active teachers, teaching Islamic subjects or other relevant subjects, willing to take part in the entire series of activities, and having a device with internet access. The training participants totaled 20 teachers. From this number, 4 key informants were selected for in-depth interviews, in addition to the madrasah head and the vice head for curriculum, taking into account variation in subjects taught and levels of experience with technology. The number of informants was considered sufficient when the data reached saturation, that is, when no new information emerged. All participants gave informed consent after receiving an explanation of the purpose of the activity, and informants' identities were kept confidential or anonymized.

The researcher, who was also the implementer of the activity, served as the main instrument, supported by the following data collection instruments: (1) a participatory observation guide to record the training process, practice, and teacher interactions; (2) a semi-structured interview guide exploring teachers' understanding of AI, their needs, difficulties, how they verify Islamic content, and changes in teaching practice; (3) a focus group discussion at the end of the activity for reflection; and (4) documentation in the form of photos, field notes, the prompts used, and the learning media produced, which were assessed using a descriptive rubric (alignment with learning objectives,

accuracy of Islamic content, visual quality, and novelty). The equipment and materials used included laptops, a projector, an internet connection, a voice recorder, the applications [ChatGPT, Gemini, Canva AI, Gamma AI, or whichever you use], as well as guidebook modules and worksheets.

The activity procedure consisted of five stages. Stage 1 was initial observation and needs analysis through interviews with the madrasah head and teachers on 25 July 2026. Stage 2 was conceptual training on generative AI, the ethics of its use, and how to verify Islamic content against primary sources (the Qur'an, hadith, and reference books) for 1 hour. Stage 3 was a technical demonstration of prompt writing and media creation. Stage 4 was hands-on practice, in which each teacher created at least one Islamic learning medium suited to their subject, followed by intensive mentoring at the end of the meeting. Stage 5 was evaluation and reflection through in-depth interviews, FGDs, and product assessment. All stages were guided by an implementation team of 20 people.

Data validity was maintained through four trustworthiness criteria (Lincoln & Guba, 1985). Credibility was achieved through source triangulation (teachers, the madrasah head, and the implementation team), technique triangulation (observation, interviews, FGDs, and documentation), and member checking, that is, having informants review summaries of their interview results. Transferability was met through a detailed description of the context. Dependability and confirmability were maintained through an audit trail, that is, recording the entire process and raw data, as well as peer debriefing within the implementation team. The content validity of the interview guide and rubric was reviewed by lecturers who are experts in their fields.

The data were analyzed qualitatively using the interactive model of Miles et al. (2014) through three concurrent flows: data condensation (selecting, focusing, and coding transcripts and field notes), data display (narrative and theme matrices), and conclusion drawing and verification. The scope of the activity was limited to the use of generative AI to develop Islamic learning media by teachers at a single partner madrasah. The limitations of this method include: (1) the small number of informants, all from a single madrasah, so the findings are contextual and cannot be statistically generalized; (2) the short duration of the activity, so the sustainability of implementation and its impact on student learning outcomes cannot yet be seen; and (3) the dual role of the implementation team as researchers, which has the potential to introduce subjectivity bias, mitigated through triangulation and member checking.

RESULTS AND DISCUSSION

The initial observations and interviews revealed three main findings. First, most teachers at MTs Miftahul Jannah did not understand AI before the activity, so AI was not yet known as a learning aid. Second, at MTs Miftahul Jannah, teachers who were already familiar with artificial intelligence (AI) technology still faced obstacles in applying it optimally in the learning process, particularly in Islamic religious education subjects. These obstacles relate to limited supporting facilities and infrastructure, such as an unstable internet connection and the lack of available laptops or computers and projectors for displaying learning media to students. These limited facilities may prevent the use of AI in teaching and learning activities from reaching its full potential.

Third, after taking part in the activity, teachers realized that many AI tools can lighten their tasks, especially in delivering lesson material. A summary of the findings is presented in Table 1.

Table 1
Findings on the Condition of Teachers at MTs Miftahul Jannah Before and After the Activity

Aspect	Before the activity	After the activity	Data source
Understanding of AI	Most teachers did not yet understand AI	Teachers realized that many AI tools can help lighten teaching tasks	Observation, interviews
Facilities and infrastructure	Limited; an obstacle for teachers who were already familiar with AI	Remains an obstacle because facilities and infrastructure are still lacking	Observation, interviews, documentation
Application in religious subjects	AI not yet applied	Teachers began to see the benefits of AI for delivering material; no media were produced	Product documentation, FGD

These findings show that teachers' initial obstacles were layered: a knowledge obstacle (not yet being familiar with AI) and a facilities obstacle. The two obstacles are not equal in this activity. The activity can address the knowledge obstacle, whereas the facilities obstacle lies beyond its reach. Therefore, the change recorded is the growth of teachers' **awareness** of the benefits of AI, not a change in well-established teaching practices. This distinction is important so that the findings are not read as larger than the data.

Awareness is an initial prerequisite for teachers to be willing to try, but it does not yet guarantee that AI will actually be used routinely and appropriately in learning.

The findings on low understanding and facility constraints are consistent with previous research. Junaidi and Mawi (2025) found that teachers' digital literacy is a challenge in the use of AI in madrasah tsanawiyah. Ren and Wu (2025) also noted the digital divide and technical shortcomings as challenges to integrating AI into learning. Within the TPACK framework, the condition of teachers at MTs Miftahul Jannah shows that technological knowledge remains a weak point, so that the pedagogical and content components cannot yet be optimally integrated (Mishra & Koehler, 2006). Teachers' awareness that AI lightens their tasks, especially in delivering material, is in line with the finding of Nurhayati et al. (2024) that AI can automate administrative tasks and allow teachers to focus more on learning. This result also points in the same direction as Hasan et al. (2026) and Wandria et al. (2026), who reported improvements in teachers' digital competence after AI training. The difference is that this activity depicts qualitative changes in attitude and awareness in a madrasah context, whereas those two studies reported improvements in technical skills. Wandria et al. (2026) also noted that teachers' digital competence was the aspect with the lowest score and still required additional mentoring, which is in line with the need for follow-up mentoring at MTs Miftahul Jannah.

Several alternative explanations need to be considered. First, the increase in teachers' awareness may be influenced by a novelty effect, that is, momentary enthusiasm for new technology that does not necessarily last (Ren & Wu, 2025). Second, teachers' answers in interviews and FGDs may have been influenced by a desire to please the implementation team. Third, limited facilities may not be the only reason AI has not been used, because our interview results indicate that teachers' habit of teaching with existing teaching materials and their concerns about the accuracy of religious content were also factors that led teachers not to use AI in learning. To reduce these possibilities, the data were compared through triangulation of observations, interviews, FGDs, and the teachers' media products.

These findings have three implications. First, efforts to improve madrasah teachers' competence need to go hand in hand with the provision of basic facilities, because training alone is not enough if teachers cannot access devices and networks. Second, follow-up mentoring is needed so that awareness develops into practice, including guidance on verifying AI-generated Islamic content against primary sources. Third, madrasahs and related parties can use these results as input for designing teacher competence development.

This study has limitations. The data come from a single madrasah with a limited number of teachers, so the findings are contextual. The short duration of the activity did not make it possible to assess the long-term application of AI or its impact on student learning outcomes. Teachers' awareness was also not measured with a quantitative instrument. Future research is recommended to involve more madrasahs, conduct long-term observation of classroom implementation, examine the impact of AI use on students' understanding in religious subjects, and specifically investigate how teachers maintain the accuracy and Islamic values of AI-generated content.

CONCLUSION

This activity concludes that the main obstacles to the use of AI by teachers at MTs Miftahul Jannah are twofold: most teachers do not yet understand AI, and the madrasah's facilities and infrastructure are limited. Through training and mentoring, the knowledge obstacle has begun to be overcome: teachers realize that various AI tools can lighten their teaching tasks, especially in delivering lesson material, including in religious subjects. Inadequate and incomplete facilities and infrastructure, as well as the habit of using long-established teaching materials, remain the main obstacles to the use of AI at MTs Miftahul Jannah. Based on the results of the activity, teachers at the madrasah have not yet used AI directly in the learning process and still rely on teaching materials they have used before, such as textbooks, modules, and existing learning materials. This condition shows that the use of AI technology has not yet become part of teachers' teaching habits. Through training and mentoring activities, teachers have begun to understand that AI can help lighten teaching tasks, especially in preparing materials and explaining religious lessons. However, there are changes that cannot be accomplished by training activities alone. Thus, the change achieved takes the form of growing awareness and initial readiness among teachers, not yet the firm application of AI in day-to-day learning.

This conclusion is important for madrasahs, policymakers, and other community service implementers, because it shows that developing the professional competence of madrasah teachers in the digital era cannot rely on training alone. Training needs to be accompanied by the provision of basic facilities and follow-up mentoring, so that teachers' awareness can develop into practice, including the habit of checking the accuracy and appropriateness of AI-generated Islamic content. These findings from a single madrasah add to the evidence from previous research that digital literacy and facilities are determinants of AI integration, by adding a picture from the context of

madrasahs and religious subjects. Because the data come from a single madrasah with a short activity duration, these findings are suitable as a contextual reference and as input for madrasahs in similar conditions, not as a generalization for all madrasahs.

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