

Digital Pedagogy in Islamic Elementary Education Transforming Learning Practices in Muhammadiyah Madrasahs

Khoiriyah, Adiba Maulidiyah

Institut Ahmad Dahlan Probolinggo

Email: riyahmad98@gmail.com, diba@webmail.umm.ac.id

Abstract:

Digital transformation has significantly reshaped educational practices by changing how knowledge is constructed, learning interactions are developed, and teachers' roles are redefined within contemporary classrooms. However, in Islamic primary education, digitalisation involves more than technological adoption; it requires integration with pedagogical objectives, students' characteristics, and Islamic educational values. This study aims to examine how digital pedagogy transforms learning practices and how digital technologies are integrated into instructional design, teacher-student interactions, learning resources, assessment processes, and Islamic values within Muhammadiyah madrasahs. This study employed a qualitative approach with an interpretive case study design conducted in a Muhammadiyah Islamic primary education institution in Probolinggo City, Indonesia. The research was carried out over a three-month period, from March to May 2025. Data were collected through non-participant classroom observations and semi-structured interviews involving eight teachers and ten students from Grades IV-VI who had experienced technology-supported learning. Data were analysed using reflexive thematic analysis to identify patterns of digital pedagogical transformation. The findings reveal three interconnected dimensions of digital pedagogy: technology-mediated learning, pedagogically directed learning, and Islamic value-oriented learning. The findings demonstrate that digital technologies expand learning resources, enhance student engagement, and support more interactive learning experiences; however, meaningful digital transformation remains highly dependent on teachers' pedagogical competence in guiding technology use towards the aims of Islamic education. This study contributes conceptually by demonstrating that digital pedagogy in Islamic primary education is not merely a process of technological integration, but rather a pedagogical and institutional transformation that connects technology, teacher agency, student participation, and Islamic value orientations.

Abstrak:

Transformasi digital telah membawa perubahan signifikan terhadap praktik pendidikan melalui perubahan cara pengetahuan dikonstruksi, interaksi pembelajaran dikembangkan, dan peran guru diredefinisi dalam konteks kelas modern. Namun, dalam pendidikan dasar Islam, digitalisasi tidak hanya berkaitan dengan adopsi teknologi, tetapi juga membutuhkan integrasi dengan tujuan pedagogis, karakteristik peserta didik, serta nilai-nilai pendidikan Islam. Penelitian ini bertujuan untuk menganalisis bagaimana pedagogi digital mentransformasi praktik pembelajaran serta bagaimana teknologi

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digital diintegrasikan dengan desain pembelajaran, interaksi guru-peserta didik, sumber belajar, proses asesmen, dan nilai-nilai Islam dalam konteks madrasah Muhammadiyah. Penelitian ini menggunakan pendekatan kualitatif dengan desain studi kasus interpretatif yang dilaksanakan pada sebuah lembaga pendidikan dasar Islam Muhammadiyah di Kota Probolinggo, Indonesia. Penelitian dilakukan selama tiga bulan, yaitu Maret hingga Mei 2025. Data penelitian dikumpulkan melalui observasi kelas nonpartisipan dan wawancara semi-terstruktur yang melibatkan delapan guru dan sepuluh peserta didik kelas IV–VI yang telah mengikuti pembelajaran berbasis teknologi. Data dianalisis menggunakan reflexive thematic analysis untuk mengidentifikasi pola transformasi pedagogi digital. Hasil penelitian menunjukkan tiga dimensi utama pedagogi digital, yaitu technology-mediated learning, pedagogically directed learning, dan Islamic value-oriented learning. Temuan menunjukkan bahwa teknologi digital mampu memperluas sumber belajar, meningkatkan keterlibatan peserta didik, serta menciptakan pengalaman belajar yang lebih interaktif, tetapi keberhasilan transformasi digital sangat bergantung pada kompetensi pedagogis guru dalam mengarahkan penggunaan teknologi sesuai dengan tujuan pendidikan Islam. Penelitian ini berkontribusi secara konseptual dengan menunjukkan bahwa pedagogi digital dalam pendidikan dasar Islam bukan sekadar proses integrasi teknologi, melainkan transformasi pedagogis dan kelembagaan yang menghubungkan teknologi, agensi guru, partisipasi peserta didik, dan orientasi nilai Islam.

INTRODUCTION

Digital transformation has fundamentally reshaped the landscape of primary education worldwide, not only through the increasing adoption of digital devices and platforms but also through changes in how knowledge is constructed, learning interactions are developed, and the roles of teachers and students are renegotiated within classrooms (Stringer et al., 2022; Tzafilkou et al., 2023). In primary education, the effectiveness of such transformation largely depends on teachers' ability to connect technology with pedagogical objectives, students' characteristics, learning activity design, and assessment processes, ensuring that digitalization does not merely represent the substitution of conventional media with digital tools (Pongsakdi et al., 2021; Wijnen et al., 2023).

This issue becomes increasingly complex within Islamic education because digital technology does not merely mediate learning processes; it also expands sources of religious knowledge, transforms relationships between learners and religious epistemic authorities, and requires critical competencies to evaluate the credibility of religious information in digital spaces (Berger & Golan, 2024; Ju'subaidi et al., 2025). Therefore, Islamic primary education faces a dual challenge: developing active, adaptive, and relevant learning experiences within a digital ecosystem while ensuring that technological utilization remains oriented toward the construction of knowledge, values, character, and students' religious responsibility (Utami, 2024; Ju'subaidi et al., 2025).

Research conducted across different countries demonstrates that the success of digital pedagogy is determined more by the quality of pedagogical integration than by the availability of technology itself (Pongsakdi et al., 2021; Stringer et al., 2022). A study in

Finland revealed that digital pedagogy training enhanced teachers' confidence in utilizing technology and reduced reliance on technological support among particular groups of teachers, indicating that professional development represents a crucial element in transforming instructional practices (Pongsakdi et al., 2021).

Research involving primary school teachers in the Netherlands further found that teachers' attitudes toward technology were associated with their readiness to employ digital tools to promote higherorder thinking skills. Meanwhile, research in Türkiye demonstrated that teachers' digital competence is influenced by professional characteristics, educational background, teaching subjects, and access to digital infrastructure (Wijnen et al., 2023; Suzer & Koc, 2024). Within the context of religious education, Berger and Golan (2024) revealed that online religious learning generates new patterns of source selection, negotiation of epistemic authority, and learner autonomy. Similarly, the implementation of web-based instruction for Islamic learning indicates the potential of technology to enhance students' participation and learning experiences (BinTaleb, 2021; Berger & Golan, 2024).

In Indonesia, the use of the internet and social media in Islamic learning has encouraged a shift from teacher-centered learning toward more learner-centered processes involving searching, discussing, and verifying learning resources. However, students' critical abilities in accessing and evaluating digital religious resources remain a significant challenge (Ju'subaidi et al., 2025). Although existing literature provides substantial evidence regarding the benefits and challenges of educational technology, studies on digital pedagogy in primary education remain largely focused on teachers' digital competencies, technology acceptance, device utilization, and students' digital skills development. Meanwhile, the relationship between technology, pedagogical design, school culture, and educational values has not always been examined as an integrated learning ecosystem (Stringer et al., 2022; Tzafilkou et al., 2023; Suzer & Koc, 2024).

At the same time, research on digitalization in religious education has predominantly explored online religious learning, digital religious knowledge sources, secondary-level learners, or religious communities, while empirical investigations into pedagogical experiences within Islamic primary education remain relatively limited (Berger & Golan, 2024; Utami, 2024; Ju'subaidi et al., 2025). This gap becomes more specific when institutional contexts are considered, as further explanation is required regarding how Muhammadiyah Islamic primary schools not only utilize technology but also transform learning planning, teacher–student interactions, learning resources, assessment practices, and the internalization of Islamic values through digital pedagogical practices (Pongsakdi et al., 2021; Ju'subaidi et al., 2025).

Therefore, the central scholarly issue that remains insufficiently explored is no longer whether technology is used in Islamic education, but rather how technology is transformed into meaningful pedagogical practices and how these practices are integrated with the identity and objectives of Islamic education within the madrasah ecosystem (Berger & Golan, 2024; Stringer et al., 2022). Addressing this gap, this study proposes an innovative framework of integrated digital Islamic pedagogy, which conceptualizes learning transformation through the interconnectedness of four domains: digital instructional

design, teacher student digital interaction, digital assessment and learning resources, and Islamic values and institutional integration (Tzafilkou et al., 2023; Ju'subaidi et al., 2025).

Unlike approaches that position application usage or teachers' technological competence as the primary indicators of digital transformation, this study investigates how technology reshapes pedagogical actions from the stages of lesson planning, classroom implementation, interaction patterns, utilization of learning resources, assessment processes, to the strengthening of Islamic values and Muhammadiyah educational identity in everyday learning practices (Pongsakdi et al., 2021; Wijnen et al., 2023; Berger & Golan, 2024).

This framework enables digital pedagogy to be understood not merely as the technologization of learning, but as a process of pedagogical and institutional transformation that brings together technological affordances, teachers' pedagogical competence, students' agency, knowledge authority, and Islamic value orientations within a unified primary education ecosystem (Stringer et al., 2022; Suzer & Koc, 2024; Ju'subaidi et al., 2025). Based on this perspective, this study aims to explore comprehensively how digital pedagogy transforms learning practices and how digital technologies are integrated with pedagogical processes and Islamic educational values within the context of Muhammadiyah Islamic primary schools (Berger & Golan, 2024; Ju'subaidi et al., 2025).

Specifically, this study addresses two research questions. First, How does digital pedagogy transform learning practices in Islamic primary education within Muhammadiyah madrasahs? (Pongsakdi et al., 2021; Stringer et al., 2022). Second, How is digital pedagogy integrated with instructional design, teacher-student interactions, digital learning resources and assessment, as well as Islamic educational values in learning practices within Muhammadiyah madrasahs? (Tzafilkou et al., 2023; Berger & Golan, 2024; Ju'subaidi et al., 2025).

METHODS

This study employed a qualitative approach with an interpretive case study design to explore how digital pedagogy shapes and is integrated into Islamic primary education learning practices within a Muhammadiyah educational institution in Probolinggo City, Indonesia. A qualitative case study approach was selected because it enables pedagogical practices to be examined within their natural classroom contexts through direct observation, contextual interpretation, and in-depth interviews (Alvi & Gillies, 2021). This approach was considered appropriate because the study focused on understanding the processes, meanings, and experiences underlying the integration of digital pedagogy rather than measuring causal relationships between variables. The research was conducted over a three-month period, from March to May 2025, prior to the scheduled publication of the article in June 2025. This period included research preparation, ethical approval, data collection, data analysis, and manuscript finalisation.

The research site was selected purposively as an information-rich case representing a Muhammadiyah Islamic primary education institution that had actively incorporated digital technologies into instructional practices. The selection of this setting was based on the school's efforts to integrate digital learning tools, technology-supported instruction, and Islamic educational values within classroom practices. Therefore, the findings are intended

to provide contextual understanding and analytical transferability rather than statistical generalisation across Islamic schools in Indonesia (Braun & Clarke, 2021b). Consistent with the focus on Islamic elementary education, the research setting was positioned as a Muhammadiyah Islamic primary education institution rather than a secondary school, allowing the study to examine digital pedagogical transformation within the developmental characteristics of primary-level learners (Alvi & Gillies, 2021).

The participants consisted of 18 individuals, including eight teachers and ten students from grades IV–VI who had experienced technology-supported learning for at least one semester. Participants were selected through criterion-based purposive sampling combined with maximum variation sampling to ensure representation of diverse teaching subjects, teaching experiences, grade levels, patterns of technology use, and students' digital learning experiences (Hennink & Kaiser, 2022). The number of participants was continuously evaluated throughout the research process based on information sufficiency and thematic saturation, whereby additional data collection was discontinued when no substantial new insights emerged from the participants' accounts (Hennink & Kaiser, 2022).

The involvement of student participants followed ethical research procedures through parental or guardian consent and students' informed assent. Students were informed about the purpose of the study, their voluntary participation, confidentiality procedures, and their right to withdraw from participation at any stage without consequences (Sun et al., 2023; Rogers et al., 2021). Data collection was conducted from March to April 2025 through non-participant classroom observations and semi-structured interviews to enable comparison between actual digital pedagogical practices and the experiences articulated by teachers and students (Alvi & Gillies, 2021).

Classroom observations were conducted in approximately ten learning sessions across grades IV–VI, with each session lasting between 45 and 90 minutes. The observations focused on technology utilisation, instructional activity design, teacher–student interactions, digital learning resources, assessment practices, student engagement, and the integration of Islamic values within digital learning activities (Alvi & Gillies, 2021). Individual interviews were conducted with teachers for approximately 40–60 minutes and with students for approximately 20–30 minutes using open-ended questions, probing techniques, and age-appropriate language to facilitate meaningful responses (Rogers et al., 2021; Sun et al., 2023).

The research instruments consisted of semi-structured interview protocols and classroom observation sheets developed based on the research questions and four initial analytical domains: digital instructional design, teacher–student digital interaction, digital resources and assessment, and Islamic values and institutional integration. The instruments were reviewed for clarity, relevance, and readability before implementation during the main research phase (Braun & Clarke, 2021b). The research procedures consisted of several stages: institutional approval and ethical preparation (March 2025), participant recruitment and informed consent procedures (March 2025), instrument refinement, classroom observations and interviews (March–April 2025), transcription and anonymisation (April 2025), thematic analysis, interpretation, and manuscript preparation (April–May 2025).

Interviews were audio-recorded with participants' permission, while field notes were used to document contextual information, classroom interactions, and significant events that could not be fully captured through verbal accounts (Rogers et al., 2021; Alvi & Gillies, 2021). The credibility of the findings was strengthened through source triangulation involving teachers and students, methodological triangulation between interviews and observations, examination of contradictory evidence, and limited member reflection with participating teachers (Braun & Clarke, 2021b).

Data analysis was conducted using reflexive thematic analysis following six analytical phases: familiarisation with the data, initial coding, theme construction, theme reviewing, theme definition and naming, and development of the final analytical narrative (Braun & Clarke, 2021a; Byrne, 2022). The coding process employed an inductive–deductive strategy, allowing analytical categories derived from the research questions to remain open to emerging patterns identified from interview and observation data (Byrne, 2022). NVivo 15 software was utilised to organise interview transcripts, observation notes, codes, analytical memos, and the research audit trail. However, interpretation of themes remained a reflexive process conducted by the researcher rather than being determined by the software (Braun & Clarke, 2021b; Byrne, 2022). Statistical analyses, including regression analysis, were not applied because this study did not aim to examine causal relationships or statistical associations among variables. Instead, the study sought to interpret the processes through which digital pedagogy transforms and becomes integrated into Islamic primary education practices within a specific institutional context (Braun & Clarke, 2021a).

FINDINGS AND DISCUSSION

Findings

The thematic analysis revealed that digital pedagogy in Islamic primary education within Muhammadiyah madrasahs develops through three major patterns: technology mediated learning, pedagogically directed learning, and Islamic value-oriented learning. These three patterns do not operate independently; rather, they constitute an integrated process of learning transformation that connects technological utilization, teachers' pedagogical decisions, student engagement, and Islamic value orientations.

The findings indicate that learning digitalization is not merely characterized by the adoption of digital devices or media, but by changes in how teachers organize students' learning experiences through technological affordances (Stringer et al., 2022; Tzafilkou et al., 2023). Within this context, technology functions as a mediator that expands forms of content representation, learning resources, and instructional interactions, while teachers remain central in determining the purposes and directions of technology utilization (Pongsakdi et al., 2021; Wijnen et al., 2023).

The first pattern, technology-mediated learning, is reflected in the use of technology to expand the ways learning materials are presented and accessed by students. Learning activities are no longer entirely dependent on textbooks and verbal explanations but are enriched through digital presentations, instructional videos, visual materials, audiovisual resources, and internet-based learning sources.

This pattern demonstrates that technology provides diverse representations of

knowledge, enabling learning materials to be presented in more visual, contextual, and accessible forms for students. These findings are consistent with Stringer et al. (2022), who emphasized that digital technology in primary education can broaden teaching strategies and learning experiences when its utilization is aligned with pedagogical needs.

The use of technology also provides opportunities for students to access more diverse information sources and reduces dependence on teachers as the sole providers of knowledge (Wijnen et al., 2023). However, the findings also reveal that technological use in some learning practices remains at a substitution level, where digital media primarily replace conventional tools without substantially transforming the structure of learning activities (Tzafilkou et al., 2023). This indicates that the presence of technology alone does not necessarily represent pedagogical transformation, as meaningful change occurs only when technology reshapes how students engage with knowledge and learning processes.

The second pattern, pedagogically directed learning, demonstrates that the effectiveness of technology integration is highly dependent on teachers' pedagogical competence and instructional decisions. Teachers who successfully integrate technology into lesson planning and classroom activities do not merely use digital media to deliver information; rather, they employ technology to encourage student participation, facilitate discussion, support exploration of learning materials, and enhance assessment processes.

These findings illustrate that technology does not automatically generate more active learning environments because pedagogical transformation remains determined by how teachers design learning activities around technological resources. This interpretation corresponds with Pongsakdi et al. (2021), who found that teachers' digital pedagogy competence and professional training contribute significantly to their readiness to utilize technology in meaningful ways. The findings also support Tzafilkou et al. (2023), who conceptualized teachers' digital competence as an integration of technological, pedagogical, and professional capabilities rather than merely technical proficiency.

The variation in technology utilization identified in this study further demonstrates that digital transformation occurs gradually and is influenced by teachers' experience, digital competence, access to technological resources, and the broader learning environment (Suzer & Koc, 2024). Therefore, the depth of digital pedagogical transformation depends not only on technological availability but also on teachers' capacity to design purposeful learning experiences.

The third pattern, Islamic value oriented learning, represents the distinctive characteristic that differentiates digital pedagogy in Islamic primary education from general approaches to educational digitalization. The findings demonstrate that technology utilization remains embedded within the broader objectives of Islamic education, meaning that digital resources and activities are not adopted without processes of selection, interpretation, and value-based consideration.

Teachers play an essential role in evaluating the suitability of digital content in relation to instructional objectives, students' developmental characteristics, and the religious values that constitute the identity of Muhammadiyah education. This finding is particularly significant because digital openness has expanded students' access to diverse religious knowledge sources with varying levels of credibility and authority (Berger &

Golan, 2024). Ju'subaidi et al. (2025) demonstrated that the internet and social media have become important sources of Islamic learning among Indonesian students; however, their educational value depends on students' critical awareness in selecting, evaluating, and interpreting religious information. Therefore, the role of teachers in digital pedagogy is not diminished by technological development. Instead, teachers' roles are transformed into pedagogical and epistemic mediators who assist students in understanding, verifying, and constructing meanings from digital information within an Islamic value framework (Berger & Golan, 2024; Ju'subaidi et al., 2025).

The findings further indicate that the integration of technology and Islamic values occurs not only through content selection but also through the orientation of technology use within learning activities. Technology is directed toward supporting knowledge construction, attitude development, character formation, and students' sense of responsibility, ensuring that digital practices remain connected to broader educational purposes.

This finding aligns with Utami (2024), who highlighted that internet-based learning provides opportunities for sustaining religious education while simultaneously presenting risks to students' religious development when digital engagement lacks appropriate guidance, control, and evaluative abilities. In this context, digital learning in Muhammadiyah madrasahs requires a balance between openness to information access and the strengthening of Islamic values as the foundation for responsible technology use (Utami, 2024; Ju'subaidi et al., 2025). Overall, the findings demonstrate that digital pedagogy in Muhammadiyah Islamic primary education represents an integrative process connecting technology as a learning mediator, teachers as pedagogical directors, and Islamic values as the guiding orientation of technological utilization.

The relationship among these three dimensions forms an integrated model of learning transformation characterized as technology-mediated, pedagogically directed, and Islamic value-oriented learning. This model indicates that digital transformation in Muhammadiyah madrasahs cannot be understood merely as an increase in technology adoption; rather, it represents a reconstruction of pedagogical practices that maintains teachers' central roles, expands students' learning agency, and positions Islamic values as the foundation for meaningful engagement with digital environments (Tzafilkou et al., 2023; Berger & Golan, 2024; Ju'subaidi et al., 2025).

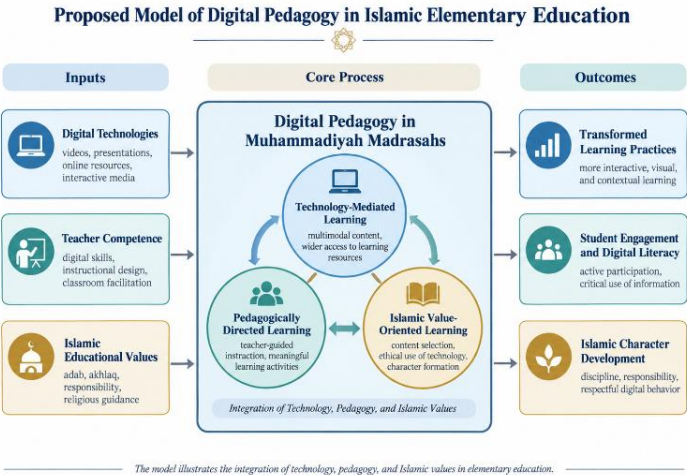


Figure 1 and Teacher Student Interview Findings

DISCUSSION

The thematic analysis revealed that the implementation of digital pedagogy in Islamic primary education within Muhammadiyah madrasahs has transformed the ways teachers design learning, deliver instructional materials, manage classroom interactions, and provide learning resources for students. Digital technology was not merely utilized as an additional instructional tool but had gradually become embedded within pedagogical practices through the use of digital presentations, instructional videos, interactive images, internet-based resources, and audiovisual materials.

These various media enabled learning content that was previously dominated by verbal explanations and textbook-based instruction to be presented in more visual, contextual, and engaging forms. This pattern indicates an initial shift from viewing technology as a technical instrument toward positioning it as an integral component of instructional design. Such findings are consistent with previous research emphasizing that the success of digital pedagogy in primary education is determined not simply by technology availability, but by teachers' capacity to connect technological affordances with pedagogical objectives and learning activities (Pongsakdi et al., 2021; Stringer et al., 2022).

The transformation of learning practices was also evident in the changing patterns of teacher student interaction. In technology-supported learning environments, teachers no longer functioned solely as the primary source of information but increasingly acted as facilitators who guided students in accessing, interpreting, and responding to digital learning materials. Students were provided with opportunities to ask questions, engage in discussions, provide responses, and connect digital information with classroom learning content. The use of visual and audiovisual media generated more diverse learning stimuli compared with conventional lecture-based approaches.

These findings demonstrate a tendency toward more participatory and student-centered learning practices. However, technology alone does not automatically produce higher levels of student engagement, as its educational impact remains dependent on teachers' ability to transform technological resources into meaningful pedagogical activities (Wijnen et al., 2023; Tzafilkou et al., 2023). Further analysis revealed that the level of digital pedagogical transformation did not occur uniformly across learning practices. In some instructional contexts, technology was still used at a substitution level, such as replacing

handwritten board explanations with digital presentations or using videos merely as supplementary materials to reinforce teacher explanations.

In other practices, however, technology expanded learning experiences by providing additional resources, encouraging information exploration, and creating opportunities for student interaction and independent learning. This variation demonstrates that teachers' digital competence represents a critical factor influencing the depth of technology integration in classroom practices. Teachers with stronger digital skills and greater technological experience tended to utilize technology for more diverse pedagogical purposes, whereas limitations related to digital competence, infrastructure availability, and internet connectivity restricted technology use to primarily presentational functions (Stringer et al., 2022; Suzer & Koc, 2024).

Therefore, digital transformation in Muhammadiyah madrasahs does not occur as a uniform process but rather as a gradual transformation shaped by teachers' individual capacities and the broader learning environment. Regarding the second research question, the findings indicate that the integration of digital pedagogy is constructed through the relationship between technology, learning objectives, teacher roles, student activities, and Islamic educational values. Technology was not positioned as the ultimate goal of learning but rather as a medium to facilitate deeper understanding of instructional content.

Within Islamic education contexts, teachers also performed a selective and mediating role by evaluating the suitability of digital content in relation to learning objectives, students' developmental characteristics, and religious values. This role has become increasingly important because internet access expands the availability of religious knowledge sources while simultaneously requiring students to develop the ability to distinguish sources, understand contexts, and evaluate the credibility of information accessed in digital environments (Berger & Golan, 2024; Ju'subaidi et al., 2025).

The integration of digital pedagogy was also reflected in teachers' efforts to connect digital content with students' value formation, character development, and religious experiences. Technology was utilized to present learning materials in more attractive formats; however, teachers continued to guide students in constructing meanings that aligned with the objectives of Islamic education. In this context, teachers functioned as mediators between the abundance of information available in digital spaces and the Islamic value framework that characterizes Muhammadiyah education.

Thus, increased access to digital resources does not diminish the significance of teachers' roles; rather, it strengthens the need for pedagogical and ethical guidance. This pattern corresponds with previous studies on Islamic education in Indonesia, which indicate that digital platforms provide significant learning opportunities while simultaneously presenting challenges when students lack sufficient abilities to control, interpret, and critically evaluate digital religious content (Utami, 2024; Ju'subaidi et al., 2025).

Overall, the thematic analysis generated three central patterns that characterize digital pedagogy in Muhammadiyah Islamic primary education. The first pattern is technology mediated learning, in which digital technology expands the forms of knowledge representation, access, and learning experiences. The second pattern is pedagogically

directed learning, indicating that the effectiveness of technology integration remains dependent on teachers' instructional design, professional competence, and pedagogical decision-making, reinforcing the importance of pedagogical dimensions within educators' digital competence (Tzafilkou et al., 2023).

The third pattern is Islamic value-oriented learning, where technology is implemented within a framework of Islamic ethics, values, and educational objectives, ensuring that digital access remains connected to students' religious character development (Utami, 2024; Ju'subaidi et al., 2025). These three patterns demonstrate that learning transformation within Muhammadiyah madrasahs is not merely a process of media digitalization but represents a broader integration between technological affordances, pedagogical practices, student engagement, and Islamic value orientations. Digital pedagogy, therefore, should be understood as a transformative educational process in which technology, human agency, and institutional values interact to construct meaningful learning experiences in Islamic primary education.

CONCLUSION

This study demonstrates that digital pedagogy transformation in Islamic primary education within Muhammadiyah madrasahs cannot be understood merely as an increase in the use of digital devices or learning media. Rather, it represents an integrative process that connects technology, teachers' pedagogical decisions, student engagement, and Islamic values. The main findings are conceptualized into three interconnected dimensions: technology-mediated learning, pedagogically directed learning, and Islamic value-oriented learning. The novelty of this study lies in highlighting that digital pedagogy within Islamic education requires both pedagogical and epistemic mediation. Technology is not only utilized to expand access to information and enhance learning interactivity but is also guided through processes of resource selection, knowledge interpretation, character formation, and digital responsibility. These findings extend existing digital pedagogy literature, which has predominantly emphasized technological competence and instructional design, by incorporating Islamic value orientation as an essential conceptual dimension in understanding digital transformation within religious educational contexts. Practically, this study suggests the need for teacher professional development that extends beyond technical digital skills toward more comprehensive competencies, including designing meaningful digital learning experiences, curating online learning resources, fostering students' critical digital literacy, and integrating Islamic values into digital learning activities. For Muhammadiyah madrasahs, digital transformation should therefore be developed through an institutional ecosystem that supports teachers' pedagogical innovation while maintaining the ethical and religious foundations of Islamic education. This study has several limitations. It was conducted within a specific Muhammadiyah madrasah context and employed a qualitative approach; therefore, the transferability of the findings should be considered cautiously. Future research is encouraged to examine this framework across more diverse Islamic educational settings through multi-site studies or mixed-methods designs. Further studies may also develop empirical instruments to investigate the relationships among digital pedagogy, digital literacy, student engagement, and Islamic character development.

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