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Menegosiasikan Inovasi Digital dan Tradisi Pesantren: Pengalaman Guru, Pengelola, dan Santri dalam Transformasi Digital Pendidikan Agama Islam

Negotiating Digital Innovation and Pesantren Traditions: Teachers', Administrators', and Students' Experiences of Digital Transformation in Islamic Religious Education

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Abstrak: *Transformasi digital di pondok pesantren bukan tentang memperkenalkan perangkat teknologi atau memindahkan pembelajaran ke platform online, melainkan negosiasi antara peluang teknologi, pengetahuan agama, otoritas guru, pedagogi tatap muka, dan nilai-nilai institusi. Makalah ini mengkaji pengalaman dan proses negosiasi pembelajaran PAI di sebuah pondok pesantren di Indonesia menggunakan desain studi kasus kualitatif (18 informan yang dipilih secara purposif: enam guru PAI, dua manajer pendidikan, dan 10 siswa). Data dikumpulkan melalui wawancara semi-terstruktur, delapan sesi observasi kelas non-partisipan, dan analisis dokumen pembelajaran institusi; dianalisis secara tematik menggunakan familiarisasi data, pengkodean awal, pengembangan kategori, dan interpretasi lintas sumber. Temuan diorganisir menjadi empat dimensi analitis yang saling terkait: adopsi teknologi digital, adaptasi pedagogis, mediasi guru, dan negosiasi berbasis nilai. Presentasi, materi audiovisual, dan smartphone memperluas akses ke materi pembelajaran dan mendiversifikasi aktivitas pembelajaran tetapi tidak menggantikan penjelasan langsung, diskusi, interaksi guru-siswa, dan praktik pembelajaran yang ada. Guru memediasi informasi agama digital dengan seleksi, pemeriksaan, penjelasan, dan kontekstualisasi sumber. Informan juga menyebutkan gangguan, kredibilitas informasi online, kompetensi digital guru, dan waktu persiapan tambahan. Penelitian ini menjelaskan transformasi digital sebagai negosiasi kontekstual (bukan pergeseran linear dari pembelajaran tradisional ke digital).*

Kontribusi: *Penelitian ini menawarkan lensa analitis empat dimensi untuk memahami interaksi antara penggunaan teknologi, keputusan pedagogis, mediasi pengetahuan keagamaan, dan nilai kelembagaan pesantren. Kerangka ini bersifat interpretatif dan berakar pada satu kasus sehingga perlu dikaji lebih lanjut dalam konteks kelembagaan yang berbeda.*

Kata Kunci: *transformasi digital; Pendidikan Agama Islam; pondok pesantren; kompetensi digital guru; mediasi guru.*

Abstract: The rapid expansion of digital technology has transformed educational practices, including Islamic Religious Education (IRE) in Islamic boarding schools. However, the integration of technology into pesantren education presents a particular challenge because technological innovation must be negotiated with established pedagogical practices and religious values. This

study examines how digital technologies are adopted and used in IRE at one pesantren in Indonesia, and how teachers, administrators, and students negotiate the relationship between digital innovation and traditional Islamic educational practices. A qualitative case study involved 18 purposively selected participants: six IRE teachers, two educational administrators, and ten students (santri). Data were collected through semi-structured interviews, eight non-participant classroom observations, and analysis of institutional documents, and were analyzed thematically through familiarization, initial coding, category development, and cross-source interpretation. The findings reveal four interconnected dimensions of digital transformation: digital adoption, pedagogical adaptation, teacher mediation, and value-based negotiation. Digital technologies expanded access to learning resources, diversified teaching strategies, and were perceived to support student engagement; however, technology did not replace direct instruction, teacher–student interaction, or traditional Islamic learning practices. Teachers acted as selectors, evaluators, and mediators of digital religious information, while participants also raised concerns about teachers' digital competence, student distraction, information credibility, and additional preparation time.

Contribution: The research contributes a context-sensitive understanding of digital transformation in Islamic education by demonstrating that meaningful digitalization in pesantren is not a linear transition from traditional to digital learning, but a negotiated process in which technological innovation is integrated with pedagogical, cultural, and religious values.

Keywords: digital transformation; Islamic Religious Education; pesantren; digital competence; teacher mediation**.**

INTRODUCTION

Digital technologies have changed how educational materials are accessed, represented, communicated and discussed. But digital transformation in education cannot be reduced to devices or online platforms available (Willermark & Gellerstedt, 2022). It also concerns teachers' pedagogical decisions, professional roles, classroom relationships as well as institutional conditions that influence technology use. Research on teachers' transition to virtual classrooms shows that digitalization is not a uniform technological shift but rather varied experiences of adaptation (Willermark & Gellerstedt, 2022); it may also reshape teachers' professional self-understanding and responsibilities (Fransson et al., 2019). In this article digital transformation refers to this classroom level sense of change (how digital resources are taken up, adapted and regulated in teaching and learning) rather than institution-wide restructuring.

These questions are especially relevant for IRE. IRE is about religious understanding and practice as well as interpretation of values, texts and ethical conduct. Its pedagogical work therefore depends not only on access to information but also credibility, interpretation and contextualization of religious knowledge. In pesantren these concerns coincide with issues of accountability.

Most teaching method were established practices (direct teacher explanation, face-to-face interaction, communal learning and authority attached to teachers and religious texts) (e.g., Dhofier, 1982; van Bruinessen, 1995). Digital resources may increase access to information but also raise questions about who selects, evaluates and explains that information. Studies of digital competence increasingly suggest that teachers' technological knowledge should be tied to disciplinary teaching rather than treated as a separate technical skill (Caviglia et al., 2024). Work on transformative digital pedagogy also cautions against thinking of technology integration as adding tools to unchanged routines (Blundell et al., 2020). These perspectives are relevant to IRE because a digital resource is educationally meaningful only if it is connected to subject matter, instructional aims and appropriate ways of interpreting religious content.

Yet technology integration is not uniform. Teachers may have technical skills limitations; preparation time; institutional support; workload; access and classroom management constraints. Studies of e-learning in Islamic education have shown challenges to implementing student-centred approaches (limited technological skills and time constraints) (Tengku Kasim et al., 2022); teachers' perspectives on digital integration in primary-school Islamic education (Azman et al., 2025). Research on teachers' technology integration also shows tensions between classroom practices and institutional or policy expectations (Abedi, 2023) and studies of nationally or regionally driven digital initiatives have looked at how such initiatives are enacted and perceived by teachers (Akcaoglu et al., 2015; Demir, 2023; Navarro Zárate et al., 2025). These findings show that the presence of technology does not explain how educational change happens.

Broader research on teachers' digital transition points in the same direction. It has addressed teachers' attitudes, technological competence and access across subject disciplines (Alieto et al., 2024); teacher digital literacy as a persistent challenge (Cortina-Pérez et al., 2014; Sánchez-Cruzado et al., 2021); teachers' changing roles in digital knowledge-based societies (including Asian contexts) (Kim, 2002); teachers' adaptation in transition to online learning (Zhang & Yang, 2024); design of teacher preparation and professional development for technology integration (Erstad et al., 2015; Morgado et al., 2021; Ou et al., 2025; Uzorka & Olaniyan, 2023). Teachers' work in digital classrooms also involves fostering students' digital protective skills which equipped classrooms alone do not secure (Berger & Wolling, 2019).

In Indonesian digital media have also become part of wider religious knowledge practices. Rusli and Nurdin (2021) explore how Indonesian ulama acquire and use online knowledge in everyday fatwa-making practices; Larson (2023) discusses the ambivalent place of smartphones in the education of religious youth; Fakhruroji (2025) studies digitally mediated religious practices among Indonesian digital natives. This literature shows that digital media are relevant to contemporary religious life but studies of online religious knowledge practices, general teacher digital competence or school-based technology integration do not explain how a pesantren negotiates digital resources within its own instructional relationships and institutional values.

The research gap addressed here is therefore not simply that there are no technology-use studies in Islamic education. Rather it is that context-sensitive empirical analysis of how teachers, educational administrators and students experience digital practices; how teachers adapt instruction while maintaining established pedagogical relationships; how online religious information is selected and mediated; and how institutional values shape decisions about acceptable technology use needs to be done. Research on teacher competence, e-learning challenges and digital religious practices exists but rarely together. This study brings them together within one institutional case. In this study one pesantren is considered as bounded institutional setting in which IRE learning, teacher–student interaction and digital resources use can be considered comprehensively.

Empirically the study records teachers, administrators and students' perspectives alongside classroom observations and institutional documents. Conceptually it develops a case-based analytical lens of digital adoption pedagogical adaptation teacher mediation value based negotiation. Practically it identifies considerations for institutional policy teacher development student digital literacy. The four dimensions are used as interacting analytical categories not stages validated or universal model of pesantren digitalization.

The study is guided by three research questions: (1) How are digital technologies adopted and used in IRE learning at the selected pesantren? (2) How do teachers, administrators and students describe changes in pedagogical practices and the IRE environment and mediation of digital religious information? (3) How are digital practices negotiated with pedagogical traditions and religious values of the institution?

THEORETICAL FRAMEWORK

A sociocultural perspective (e.g., Vygotsky, 1978) views educational practices as relational; institutional norms; tools and shared meanings. Digital technology does not determine teaching and learning independently from teachers' purposes, students' participation, resources available to them and institutional expectations. This is useful for studying pesantren because digital practices are introduced into an existing educational culture rather than into an institutional vacuum. Technology can be accepted, limited or adapted according to how participants understand its relationship with educational and religious purposes. Accounts of Asian and Islamic education settings also treat technology as entangled with inherited educational values (Richards, 2004; Tan, 2011).

The TPACK framework (Mishra & Koehler, 2006) is a sensitizing concept for exploring the relationship between technological knowledge, pedagogical knowledge and content knowledge and TPACK-inspired models have been proposed for teacher training (Silva et al., 2021). IRE dimensions also require attention to credibility and religious appropriateness of digital materials. The present study therefore uses the term discipline sensitive digital competence to refer to situated capacity to select and use technology pedagogically appropriate and responsible towards religious content (this is an interpretive extension used to discuss the case not a separately validated measurement scale). Teacher mediation refers to work of selecting evaluating explaining contextualising guiding students' use of digital religious information. Four dimensions shape the interpretation of the case. Digital adoption refers to digital devices or resources being used in learning activities; pedagogical adaptation is change in how teachers represent content, organize activities and connect digital materials with explanation and discussion; teacher mediation is evaluation and contextualization of information and guidance of student use; value-based negotiation is how participants judge and regulate digital practices in relation to the educational and religious identity of the pesantren.

Dimensions are conceptually separable but empirically overlapping. They are not assumed to occur in a fixed sequence (institutional values can influence adoption decisions at the beginning of the process; classroom experience influences later pedagogy and mediation). This framework borrows from work on digital competence in disciplinary contexts (Caviglia et al., 2024), changes in teachers' professional roles

(Fransson et al., 2019) and negotiation of tradition and modern knowledge in Islamic schooling (Tan, 2011). It is used to interpret the case not as a test of a model.

RESEARCH METHOD

This study employed a qualitative case study design to examine technology-driven transformation in IRE within its institutional setting. A case study was appropriate because the research questions concern how participants interpret and negotiate technology use in relation to pedagogical practices and institutional values, rather than measuring the isolated effect of a particular device or platform. The case is bounded by one pesantren, IRE learning activities in that institution, and a fieldwork period from January to July 2026.

The study involved 18 participants selected purposively because of their direct involvement in, or experience of, technology-supported IRE learning. They comprised six IRE teachers/ustadz (T1–T6), two educational administrators (A1–A2), and ten students/santri (S1–S10). Teachers were included because they had used digital technology in IRE instruction; administrators because they were involved in educational planning or institutional decision-making; and students because they had participated in IRE lessons involving digital resources. Table 1 summarizes the participants.

Table 1. Participants.

Code	Role	n	Basis for inclusion	Interview duration
T1–T6	IRE teacher (ustadz)	6	Had used digital technology in IRE instruction	45–60 minutes
A1–A2	Educational administrator	2	Involved in educational planning or institutional decision-making	45–60 minutes
S1–S10	Student (santri)	10	Had participated in IRE lessons involving digital resources	30–45 minutes
Total		18	All participants were interviewed individually	

Note. Participants were selected purposively; codes are used in the Results to identify quotations.

Data collection comprised semi-structured interviews, non-participant classroom observations, and document analysis. Individual interviews were conducted with all 18 participants. Interviews with teachers and administrators lasted approximately 45–60 minutes, while student interviews lasted approximately 30–45 minutes. Interviews were conducted in Indonesian, audio-recorded with consent, and transcribed verbatim. The

interview topics included experiences of technology use, changes in teaching and learning, perceived opportunities and challenges, and the relationship between digital practices and Islamic educational traditions.

Eight IRE learning sessions were observed, each lasting approximately 60–90 minutes. The non-participant observation focused on technologies used, teaching strategies, student participation, teacher–student interaction, learning activities, and the combination of traditional and digital practices. Three sessions involved digital presentations, two involved audiovisual materials, and three involved smartphone-based activities. Table 2 summarizes the recorded forms of digital technology use.

Table 2. Forms of Digital Technology Use Recorded in Classroom Observations.

Form of digital use	Sessions recorded	Related observations
Digital presentations	3	Visual materials were used alongside direct explanation, questioning, and discussion; students were generally more attentive when visual materials were introduced.
Audiovisual materials	2	Visual materials were used alongside direct explanation, questioning, and discussion; students were generally more attentive when visual materials were introduced.
Smartphone-based learning activities	3	Smartphones gave access to additional explanations and resources; across the eight sessions, unrelated application use was recorded in two sessions.
Total observed	8	Each session lasted approximately 60–90 minutes.

Note. Counts refer to the recorded forms of digital use across the eight observed sessions.

Documents examined included lesson plans, digital teaching materials, learning assignments, presentation materials, and institutional guidelines concerning technology use. These materials were used to contextualize and corroborate interview and observation accounts.

The researcher served as the primary instrument, supported by an interview guide, observation protocol, and document-analysis checklist. Data were analyzed thematically through familiarization, initial coding, category development, and thematic interpretation, steps that broadly correspond to the phases described by Braun and Clarke (2006). Interview transcripts, observation notes, and documents were reviewed repeatedly. Initial codes concerned technology use, teacher experiences, pedagogical changes, student responses, institutional factors, and tensions between traditional and digital approaches. Related codes were grouped into categories and interpreted in

relation to the research questions. The analysis combined data-led attention to recurring accounts with the four analytical dimensions described above as interpretive sensitizing concepts. Cross-source triangulation was undertaken by comparing interview accounts with observation notes and institutional documents. The analysis also considered differences among teachers', administrators', and students' perspectives.

RESULT

Analysis of interviews with 18 participants, eight classroom observations, and institutional learning documents identified four interrelated themes: digital adoption, pedagogical adaptation, teacher mediation, and value-based negotiation. The themes are presented as analytical dimensions that overlap in practice rather than as sequential stages. Quotations were translated from Indonesian and are identified by participant codes (T = teacher, A = administrator, S = student). Table 3 summarizes the four themes and the evidence supporting each.

Table 3. Themes and Supporting Evidence.

Theme	Core finding	Participants quoted	Observation evidence
Digital adoption	Digital technologies were incorporated as supplementary resources within existing IRE activities; use was gradual, selective, and conditional on institutional values.	T1, T3, A1, S2	Presentations in three sessions, audiovisual materials in two, and smartphone-based activities in three, alongside direct explanation, questioning, and discussion.
Pedagogical adaptation	Digital resources broadened how teachers presented and contextualized material, while teacher explanation remained necessary for interpretation.	T2, T5, S5, S7	Students were generally more attentive when visual materials were introduced; attention varied by student and activity.
Teacher mediation	Teachers selected, checked, explained, and contextualized digital religious information, which added preparation time and classroom-management demands.	T1, T6, S4	Unrelated smartphone-application use in two sessions; teachers redirected attention and clarified device-use expectations.
Value-based negotiation	Technology was acceptable when consistent with the educational aims and religious values of the pesantren; tradition provided criteria for selecting and regulating digital practices.	A2, T4, S9	Direct interaction, religious discussion, explanation of ethical values, and classroom discipline were recorded in lessons using digital media.

Note. Participants listed are those quoted in the Results and do not constitute a full count of participants who raised each theme. Four of six teachers raised concerns about smartphone use and five of six emphasized verifying online religious information.

Digital Adoption: Technology as an Additional Learning Resource

The main finding is that digital technologies were inserted into IRE activities as supplementary resources but not as substitutes for direct teaching. Teachers talked about gradual and selective adoption of digital materials: "Traditional method still counts. Technology helps us add more material but teacher is the one who guides students". T1; T3 also said: "We are starting to use more digital materials (videos, presentations etc.) but still need explanation and discussion".

Administrators and students also described adoption conditional and complementary: A1: "Pesantren accepts technology development but the use of technology has to be in line with values and educational goals of pesantren". S2: "Usually ustadz explains first then we use phones to find more information or watch related video".

Digital presentations were recorded in three sessions, audiovisual materials in two sessions and smartphone learning activities in three sessions. In all observed lessons teachers used direct explanation, questioning, discussion and Islamic learning materials too. These observations support interpretation that digital resources were embedded within existing arrangements.

Pedagogical Adaptation: Diversifying Representation and Classroom Activity

The second finding indicates that digital resources expanded the ways in which teachers presented and contextualised learning materials, while teacher explanations remained important for interpretation. T2 stated, "With digital media, I can show examples that are difficult to explain using words alone. Students can see them directly."

Similarly, T5 remarked, "That's why we have digital media: so students can see." Another T6 explained, "Previously, I relied mostly on books and verbal explanations. Now, I can combine textbooks with presentations, videos, and other digital resources."

Students also described variations in their learning experiences; however, none indicated that digital media had replaced the guidance provided by teachers. S5 stated, "The lesson is more interesting when there is a video or presentation because we do not

only listen to the teacher." S7 offered a qualification, noting, "Sometimes, digital materials make the topic easier to understand, but we still need the ustadz to explain its meaning."

Classroom observations further indicated that students were generally more attentive when visual materials were introduced, although levels of attention varied across students and classroom activities. Nevertheless, these observations should not be interpreted as evidence of improved academic achievement or long-term learning outcomes.

Teacher Mediation: Evaluating and Contextualizing Digital Religious Information

The third finding is that teachers still had to mediate digital information (especially when it was religious). Students appreciated having another explanation but also knew they needed to check online sources for reliability. S4 said, "If we don't understand something, we can search for another explanation. But if it is about religion we usually ask the teacher whether the information is right."

Teachers saw verification and preparation as part of technology supported instruction too. T6 said, "Students can find information very easily but not everything is reliable. Teacher has to guide them in choosing the right sources." T1 said "Preparing digital material takes more time. We have to search, select and check material before using it."

These statements show that technology use expanded teachers' responsibilities beyond resource selection to credibility assessment, explanation and contextualization. Four of the six teachers expressed concerns about students' smartphone use and five of the six emphasized verifying online religious information. In two sessions observed some students switched between learning material and unrelated smartphone applications; teachers redirected attention and clarified device-use expectations. These findings show both pedagogical possibilities and classroom management demands of digital access.

Value-Based Negotiation: Integrating Innovation with Pesantren Identity

The fourth finding is that technology was only acceptable when it conformed to the educational aims (i.e. pesantren character) and religious values of the institution (A2 "Technology is just a tool. Character and values of the pesantren are what education is based on"). T4 reinforced this point: "Technology cannot replace teacher (especially in religious education). Students need example, guidance and interaction.". Students also

depended on teacher interpretation ("we can search for information on internet but we still need ustadz to tell us if it's correct and appropriate" S9). Observations also show direct interaction, religious discussion, explanation of ethical values and classroom discipline during lessons where digital media were used. Evidence shows that tradition was not an obstacle to innovation but criteria through which digital practices were selected and regulated.

DISCUSSION

The findings suggest that digital transformation in the studied pesantren is best understood as a negotiated pedagogical process. The four dimensions—digital adoption, pedagogical adaptation, teacher mediation, and value-based negotiation—are analytically distinguishable but interact in everyday teaching. The data do not support a fixed sequence or a causal chain among them. Participants' accounts indicate, rather, that institutional values shaped which resources were considered acceptable, that adopted resources opened opportunities for pedagogical adaptation, and that the use of digital religious information heightened the importance of teacher mediation. Whether classroom experience in turn reshapes institutional rules and teachers' choices was not examined directly in this study and remains a question for longitudinal research.

First, digital adoption in this case was selective and supplementary. The continued use of direct explanation, questioning, discussion, and established learning materials indicates that technology was incorporated into an existing pedagogical ecology. This finding is consistent with Willermark and Gellerstedt (2022), who describe teachers' digital transition as a process involving adaptation, and with Blundell et al. (2020), who argue that technology becomes educationally significant through pedagogical change rather than mere presence. The present case adds that adaptation is also evaluated against the institutional and religious purposes of pesantren education.

Second, pedagogical adaptation concerned the representation and organization of learning rather than the wholesale replacement of teaching methods. Presentations and audiovisual resources allowed teachers to provide examples and vary explanations. Students' accounts suggest that these resources could make lessons more engaging or particular topics easier to follow, but they also emphasized the continued need for teacher explanation. This distinction matters: perceived interest or attentiveness should not be treated as proof of improved achievement. The evidence supports a claim about

changes in classroom experience and instructional variety, not causal claims about learning outcomes.

Third, teacher mediation is central to understanding digital competence in IRE. Caviglia et al. (2024) argue for embedding digital competence within disciplinary practice. The present findings specify what this can involve in a religious subject: teachers select sources, assess credibility, explain meaning, contextualize information, and guide students' responsible use. General operational digital literacy is therefore insufficient on its own. Discipline-sensitive digital competence in this case involves the intersection of technological knowledge, pedagogical judgment, subject knowledge, and responsibility toward religious content. This interpretation is compatible with the TPACK perspective, while emphasizing the additional epistemic responsibility associated with religious knowledge.

Teacher mediation also helps explain why expanded access does not automatically produce reliable understanding. Online sources may vary in authority, accuracy, and context. Students' practice of consulting teachers about religious information suggests that teacher–student relationships remain a mechanism through which digital information is interpreted. This finding extends research on online religious knowledge practices (Rusli & Nurdin, 2021) by examining mediation within institutional classroom relationships rather than only individual access to online sources.

Fourth, value-based negotiation should not be framed as a conflict in which tradition necessarily resists modernity. In this case, participants described technology as acceptable when it supported educational aims and remained compatible with the pesantren's values. Tradition functioned as a resource for evaluating innovation, including decisions about device use, teacher authority, direct interaction, and the appropriateness of online content. This interpretation resonates with Tan's (2011) discussion of the encounter between inherited Islamic educational traditions and modern knowledge, while showing how the negotiation now occurs through everyday decisions about digital resources.

The smartphone findings further illustrate this ambivalence. Smartphones provided access to additional explanations and resources, but observations also recorded unrelated application use in two sessions. Larson (2023) similarly describes the complex relationship between smartphones and religious youth in Indonesia. The implication is not that smartphones should be universally encouraged or prohibited. Rather, their

educational value depends on clear learning purposes, appropriate supervision, student digital literacy, and institutional rules that are understood by teachers and students.

Taken together, the four dimensions offer a case-grounded analytical framework that adds institutional and disciplinary context to technology-centred accounts of digital transformation. Its contribution is not to establish a universal sequence or validated model. Instead, it shows how four processes can be examined together: whether and how technology is taken up; how teaching is adjusted; how religious information is mediated; and how practices are judged in relation to institutional values. The framework is potentially useful as an interpretive lens for comparative research, but its transferability requires testing in other pesantren and Islamic educational institutions.

The practical implications follow directly from the findings. Since teachers reported additional preparation and verification work, professional development could usefully integrate technical operation with instructional design, source evaluation, classroom management, and the interpretation of digital religious content. Since students sometimes used smartphones for unrelated activities, institutional leaders and teachers could develop clear, consistently communicated rules for device use that distinguish permitted learning activities from distraction. Since students relied on teachers to verify online religious information, learning activities could explicitly develop source evaluation, comparison of claims, and responsible consultation. These are recommendations derived from the case, not interventions whose effectiveness has been tested in this study.

CONCLUSION

This study examined how digital technologies are adopted, experienced, and negotiated in IRE at one pesantren. In response to the first research question, digital technologies were incorporated as supplementary resources, including presentations, audiovisual materials, and smartphone-based activities, while direct explanation and discussion remained part of classroom practice. In response to the second question, teachers adapted the representation of learning materials and assumed an expanded mediating role by selecting, checking, explaining, and contextualizing digital religious information. Students described digital materials as potentially useful and engaging but continued to value teacher interpretation. In response to the third question, digital

practices were considered acceptable when aligned with the educational purposes and religious values of the institution.

The study's main contribution is a four-dimensional analytical lens—digital adoption, pedagogical adaptation, teacher mediation, and value-based negotiation—for understanding digital transformation as an interactive process rather than a linear shift from traditional to digital learning. The findings do not demonstrate improved academic achievement or long-term learning outcomes. They instead illuminate participants' experiences and observed classroom practices in one institutional case.

The study is limited by its single-case design, the involvement of 18 participants, and observations of only eight learning sessions, which may not capture the full range of teaching practices across an academic year. Participants were also selected for their experience with technology-supported learning, so the views of teachers and students who use little or no digital technology are not represented. The study examined reported experiences and observed practices rather than directly measuring long-term learning outcomes or students' digital religious literacy. The findings are therefore context-specific and should not be generalized automatically to other pesantren. Future research could compare institutions with different cultures, technological readiness, and religious orientations; follow teaching practices longitudinally; and examine how teachers and students evaluate conflicting or unreliable religious information online. Further empirical work is also needed to assess the usefulness of the four-dimensional analytical lens across different educational settings.

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