Artificial Intelligence, Islamic Values, and Social Transformation: Negotiating Pendhalungan Culture in Islamic Education at SD Negeri Sukabumi 2 Probolinggo City

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Abstract

The emergence of Artificial Intelligence (AI) is reshaping social relations, educational practices, and cultural interactions, including within Muslim communities. In Probolinggo City, East Java, these changes take place within the distinctive Pendhalungan cultural context, characterized by cultural encounters, social openness, religious traditions, and interaction between Madurese and Javanese cultural identities. This study aims to examine how AI contributes to social transformation in Islamic education while exploring its relationship with Islamic values and Pendhalungan culture at SD Negeri Sukabumi 2 Probolinggo City. Employing a qualitative case study approach, this research uses observation, semi-structured interviews, and documentation to explore teachers' and students' experiences of AI-assisted learning and its implications for religious, social, and cultural practices. The findings indicate that AI provides new opportunities for accessing Islamic knowledge, developing learning materials, facilitating communication, and expanding students' learning resources. At the same time, AI introduces challenges related to digital dependency, information verification, academic integrity, reduced interpersonal interaction, and the preservation of local cultural identity. From a Pendhalungan perspective, AI-mediated social transformation requires a dialogical process between technological innovation, Islamic ethical principles, and local cultural values. The study argues that Islamic education can function as an important space for negotiating these transformations by integrating technological literacy with religious moderation, social solidarity, respect for cultural diversity, and responsible use of technology. Thus, AI should not merely be viewed as a technological instrument but as a social force whose impact is shaped by religious and cultural contexts.

Keywords: Artificial Intelligence, Islamic Education, Pendhalungan Culture, Social Transformation, Religious Values

Introduction

Artificial intelligence (AI) has moved from a specialist technological domain into everyday educational practice. Generative AI systems can produce explanations, summaries, learning activities, images, translations, and conversational responses, thereby changing how teachers prepare instruction and how learners search for and process information. Reviews of AI in education show that the field has developed from intelligent tutoring and adaptive systems toward broader forms of learning analytics, automated feedback, content generation, and human–AI interaction (Zawacki-Richter et al., 2019; Holmes et al., 2022). More recent studies of generative AI and ChatGPT similarly identify opportunities for personalization, content development, engagement, and support for teachers and learners, while emphasizing limitations

involving reliability, bias, critical thinking, and responsible use (Kasneci et al., 2023; Lo, 2023; Albadarin et al., 2024).

The educational significance of AI, however, cannot be reduced to efficiency or access. Education is simultaneously an epistemic, ethical, social, and cultural process. When learners increasingly encounter knowledge through algorithmic systems, questions arise concerning who or what is trusted as an authority, how information is verified, how originality is understood, and how interpersonal relationships are maintained. Holmes et al. (2022) argue that AI in education must be understood in relation to the wider purposes of education rather than through technological capability alone. Likewise, the community-wide ethics framework proposed by Holmes et al. (2022) emphasizes that ethical concerns in AI-supported education include agency, justice, privacy, transparency, accountability, and the potential effects of automated systems on human relationships. UNESCO (2023, 2024) consequently frames AI literacy around human-centred agency, ethics, technical understanding, and responsible participation.

These concerns become more complex in Islamic education. Islamic education is not only concerned with transmitting information but also with forming adab, moral judgment, responsibility, social solidarity, and an orientation toward truth (Ardani et al., 2025). A learner may therefore use AI to locate a Qur'anic explanation or develop learning materials, but the educational question remains whether the information is authoritative, whether it is interpreted appropriately, and whether the process strengthens or weakens the learner's capacity for reflection and ethical action (Khobir et al., 2021). Recent work on AI and Islamic education has begun to argue that AI should remain subject to moral reasoning and human accountability rather than becoming a substitute for teachers, scholars, or religious judgment (Yusgiantara, 2026). This concern is consistent with broader scholarship showing that AI ethics in education requires attention to epistemic authority, bias, privacy, academic integrity, and human agency (Floridi et al., 2018; Jobin et al., 2019; Tlili et al., 2023).

The cultural dimension is equally important. Probolinggo City is situated within the Pendhalungan cultural area of the eastern part of Java, where historical interaction between Javanese and Madurese communities has generated distinctive forms of language, social interaction, and cultural expression. Research describes Pendhalungan as a dynamic process of acculturation rather than a completely fixed cultural category (Raharjo, 2016; Satrio et al., 2021). Studies of Pendhalungan language and cultural expression have also located Probolinggo within this broader cultural space (Witasari & Murdiyanto, 2018; Tjahyadi, 2020; Puspandari & Tricahyaningati, 2026). The concept is therefore useful for examining how communities negotiate difference and develop shared practices while retaining cultural plurality.

The encounter between AI and Pendhalungan culture raises a question that has received limited attention: how does technological transformation interact with a locally grounded culture that is itself shaped by negotiation, adaptation, and cultural encounter? Existing AI-in-education research is dominated by questions of learning outcomes, teacher adoption, ethics, and technological affordances. Conversely, studies of Pendhalungan culture have focused more strongly on identity, acculturation, language, arts, and social relations. The intersection of these fields—AI, Islamic education, social transformation, and Pendhalungan cultural negotiation—remains underexplored. This gap is particularly relevant at the elementary-school level, where

digital practices are introduced alongside foundational religious, social, and cultural formation (Al.Mardhafi et al., 2026).

The present study addresses this gap through a qualitative case study at SD Negeri Sukabumi 2 Probolinggo City. The study asks three questions: (1) how is AI experienced and used in Islamic educational practice; (2) what opportunities and challenges does AI create for Islamic values and social relations; and (3) how can Pendhalungan cultural values provide a contextual lens for negotiating AI-mediated transformation? The study is guided by the proposition that responsible AI integration in Islamic education is most sustainable when technological literacy is combined with human agency, religious ethics, social solidarity, and respect for cultural plurality.

Methods

Research Design

This study employed a qualitative case study design. The case was SD Negeri Sukabumi 2 Probolinggo City, selected because the school provides a concrete setting in which Islamic education, elementary education, digital learning practices, and the local Pendhalungan cultural environment intersect. A qualitative case study was appropriate because the purpose was to understand meanings, experiences, practices, and contextual negotiations rather than to estimate a population parameter or test a causal intervention (Creswell & Poth, 2018; Yin, 2018). The analytical orientation treated AI not simply as a classroom tool but as a social and cultural mediator whose meanings are produced through interaction among teachers, students, religious values, and local culture.

Participants and Setting

The study focused on teachers and students who encountered or participated in AI-assisted learning activities in the school context. Participants were considered purposively because their experiences were directly relevant to the research questions. The school setting was examined as a bounded case, while individual participants were treated as sources of situated perspectives rather than as statistically representative of all Indonesian schools. Attention was given to the school's Islamic educational practices, patterns of teacher–student interaction, forms of digital learning, and references to local social and cultural life.

Research Procedures

The research proceeded through four connected stages. First, the researcher mapped relevant educational and cultural practices surrounding AI use. Second, observations were used to identify how AI-supported activities were incorporated into learning and communication. Third, semi-structured interviews explored perceptions of usefulness, trust, verification, responsibility, religious values, social relationships, and cultural identity. Fourth, school documents and learning materials were examined to contextualize the observed and reported practices. The procedure followed an iterative logic in which preliminary interpretations informed subsequent questions and document examination.

Data Collection Techniques

Three techniques were used: observation, semi-structured interviews, and documentation. Observation focused on AI-related learning activities, teacher mediation, student interaction, and visible forms of digital dependence or verification. Interviews explored how participants

understood AI, what they considered useful or problematic, and how they connected AI use with Islamic values and local cultural life. Documentation included relevant learning materials, school documents, and examples of AI-assisted educational products where ethically appropriate. The use of multiple sources supported triangulation and reduced dependence on a single account (Merriam & Tisdell, 2016; Miles et al., 2020).

Data Analysis Technique

Data were analyzed thematically through data condensation, coding, category development, comparison across sources, and interpretation (Miles et al., 2020). Initial codes were organized around AI affordances, information verification, academic integrity, teacher agency, interpersonal interaction, Islamic ethics, social solidarity, and cultural identity. These categories were then compared to identify broader patterns of negotiation. Negative or contrasting observations were retained rather than eliminated so that the analysis would not assume that AI was uniformly beneficial or harmful. The final interpretation connected empirical themes with scholarship on AI in education, Islamic ethics, and Pendhalungan cultural negotiation.

Trustworthiness and Ethical Considerations

Trustworthiness was addressed through source triangulation, iterative comparison of observation, interview, and documentary evidence, and attention to alternative interpretations. The study also maintained contextual sensitivity by avoiding the treatment of Pendhalungan culture as a single homogeneous identity. Participant identities were treated confidentially, and the analysis focused on practices and meanings rather than personal judgments. Because the study concerns school-age learners, responsible research practice requires particular attention to consent, privacy, data minimization, and protection from unintended disclosure. These principles are consistent with human-centred approaches to AI and educational research (UNESCO, 2023; UNESCO, 2024).

Results

AI as an Expanded Learning Resource

The first pattern concerns the expansion of learning resources. AI-assisted tools can help teachers generate examples, draft learning activities, vary explanations, and prepare supplementary materials. For learners, AI can function as an additional conversational resource for asking questions, exploring unfamiliar concepts, and receiving explanations in alternative wording. This finding is consistent with broader reviews reporting that generative AI can support content creation, interaction, personalization, and access to educational resources (Kasneci et al., 2023; Lo, 2023; Albadarin et al., 2024). In Islamic education, the same affordance can help learners explore religious concepts, provided that AI-generated content is treated as a preliminary resource rather than as an unquestionable religious authority.

The educational value of this expansion depends on teacher mediation. AI-generated explanations may be fluent without being accurate, contextually appropriate, or theologically adequate. Participants' experiences therefore point toward a distinction between access to information and access to trustworthy knowledge. In practice, AI becomes pedagogically useful when teachers help students formulate questions, compare answers with established sources, identify uncertainty, and revise outputs. This is consistent with UNESCO's human-centred approach, which places critical judgment and human agency at the centre of AI competency (Miao et al., 2024).

AI, Verification, and the Problem of Epistemic Trust

A second pattern concerns information verification. The ease with which generative AI produces confident-sounding responses creates a risk that students may equate fluency with truth. This risk is especially consequential for Islamic learning because religious statements may require attention to the Qur'an, hadith, established scholarship, interpretive context, and differences of scholarly opinion. The study therefore identifies verification as an essential dimension of AI literacy in Islamic education. Rather than prohibiting AI categorically, the educational response is to teach students when AI output requires checking, which sources should be consulted, and how uncertainty should be communicated.

This finding corresponds with research showing that AI systems can reproduce bias, inaccuracies, or misleading outputs and therefore require human oversight (Floridi et al., 2018; Jobin et al., 2019; Kasneci et al., 2023). It also supports recent AI-literacy frameworks that combine technical knowledge with critical evaluation and ethical awareness (Ng et al., 2021; Miao et al., 2024). In this sense, Islamic education can contribute a distinctive epistemic ethic: knowledge should be accompanied by responsibility, humility, verification, and respect for legitimate sources of authority.

Academic Integrity and the Changing Meaning of Student Work

A third pattern is the tension between AI assistance and academic integrity. When students can obtain ready-made answers, essays, summaries, or explanations, the boundary between assistance and substitution becomes less clear. The concern is not limited to plagiarism in a narrow sense. It also involves whether students have actually engaged in the cognitive and moral work that an assignment is intended to cultivate. Studies of ChatGPT in education similarly identify academic integrity and assessment redesign as central challenges (Cotton et al., 2024; Lo, 2023; Albadarin et al., 2024).

The case suggests that integrity should therefore be approached through process-oriented learning. Teachers can require students to show questions, drafts, revisions, source checks, reflections, and oral explanations rather than relying solely on finished written products. In Islamic educational terms, this approach connects academic integrity with amanah: the responsibility to produce work honestly and to use technological assistance without misrepresenting another process as one's own. AI literacy thus becomes part of character education rather than a separate technical competency.

AI and Interpersonal Relations in the Classroom

The fourth pattern concerns interpersonal interaction. AI can increase access to individualized explanations, but excessive reliance on automated interaction may reduce opportunities for dialogue with teachers and peers (Hidayat & Fatmawati Nur Khasanah, 2025). The issue is not that every use of AI necessarily reduces interaction; rather, the social consequences depend on how the technology is positioned within the learning design. When AI is used to prepare questions for discussion, compare interpretations, or support collaborative projects, it can become a stimulus for human interaction. When it replaces questioning, discussion, or teacher feedback, it may narrow the relational dimension of education.

This finding reinforces the argument that educational technology should be evaluated against the social purposes of education rather than only against efficiency. Holmes et al. (2022) and the U.S. Department of Education (2023) both emphasize human agency, teacher

involvement, and the need to design AI use around pedagogical goals. In the present case, the teacher remains an important mediator who connects technological resources with students' social, religious, and cultural development.

Pendhalungan Culture as a Context for Negotiation

The fifth pattern concerns cultural identity. Pendhalungan culture is best understood here as a dynamic field of interaction rather than a fixed list of cultural traits. Research describes the cultural area as emerging through long-term interaction and acculturation between Javanese and Madurese communities, with Probolinggo included within the broader Pendhalungan region (Raharjo, 2016; Permadi, 2019; Tjahyadi, 2020). More recent linguistic research likewise places Probolinggo within the Pendhalungan dialect area and shows that linguistic variation reflects layered histories and identities (Puspandari & Tricahyaningati, 2026).

Within this context, AI-mediated transformation can be negotiated rather than simply accepted or rejected. The same cultural openness that enables adaptation may support experimentation with new technologies, while local religious and communal practices provide criteria for deciding which uses are appropriate. The educational implication is to connect AI tasks with local contexts—for example, students can investigate local expressions, oral traditions, community practices, or intergenerational stories while using AI only as a support for organization, comparison, or presentation. Such activities position technology as a means of documenting and discussing culture rather than as a replacement for cultural experience.

Emerging Pattern: A Human-Centred Islamic–Pendhalungan Model

Across the five themes, the findings point to a contextual model of AI integration built around four mutually reinforcing principles: human agency, Islamic ethical mediation, social solidarity, and cultural responsiveness. Human agency means that teachers and students retain responsibility for decisions. Islamic ethical mediation means that AI output is evaluated against principles of truthfulness, amanah, justice, adab, and responsible conduct. Social solidarity means that AI use should strengthen rather than displace relationships among learners, teachers, families, and communities. Cultural responsiveness means that local Pendhalungan identities are treated as resources for learning and interpretation rather than as obstacles to technological modernization.

Dimension	Observed/Identified Issue	Educational Response
Human agency	Dependence on automated answers	Teacher mediation, questioning, reflection
Epistemic responsibility	AI output may be inaccurate or decontextualized	Source verification and comparison
Academic integrity	Ready-made outputs can substitute for student work	Process-based assessment and disclosure
Social relations	Automated interaction can displace dialogue	Collaborative and teacher-mediated AI use
Cultural identity	Generic AI content may marginalize local context	Pendhalungan-based tasks and cultural documentation
Islamic values	Technology may be treated as morally neutral	Amanah, adab, justice, moderation, and responsibility

Table 1 summarizes the central themes as a contextual framework rather than as a statistical measurement. The framework indicates that AI integration is not a single technological decision; it is a series of educational choices about knowledge, relationships, ethics, and cultural meaning.

Discussion

AI as a Social Force in Islamic Education

The findings support a shift from a tool-centred view of AI toward a socio-cultural view. AI changes not only how information is accessed but also how authority, authorship, interaction, and learning effort are organized. This interpretation is consistent with scholarship that treats AI in education as a field involving pedagogical, ethical, and social assumptions (Zawacki-Richter et al., 2019; Holmes et al., 2022). The present case adds a local-cultural dimension: the effects of AI are mediated by a community's existing practices of negotiation and identity.

For Islamic education, this has an important implication. If education is understood as the formation of intellectually capable and morally responsible persons, then the central question is not whether AI can answer a question but whether its use cultivates better judgment. AI can support exploration, but it cannot by itself provide the complete social and moral context in which knowledge becomes meaningful. This distinction is especially important for religious education because interpretation involves tradition, authority, context, and ethical responsibility. The recent Islamic ethical framework proposed by Yusgiantara (2026) similarly emphasizes that AI should be critically mediated so that technological systems do not replace moral agency.

Religious Values as Mediating Principles

The study suggests that Islamic values can function as mediating principles rather than as a list of prohibitions. Amanah can guide honesty in acknowledging AI assistance; ṣidq can guide truthfulness and verification; adab can guide respectful interaction; ʿadl can frame concerns about fairness and unequal access; and maslahah can orient technology toward educational benefit rather than novelty. This approach aligns with contemporary AI-ethics scholarship that emphasizes human dignity, justice, transparency, accountability, and responsibility (Floridi et al., 2018; Jobin et al., 2019; Holmes et al., 2022).

Such mediation also supports religious moderation. Students need not be positioned between unconditional enthusiasm and categorical rejection. Instead, they can learn to ask what AI is for, what risks accompany its use, whose interests are affected, and where human judgment remains indispensable. This orientation resonates with UNESCO's emphasis on responsible AI competencies and with recent studies arguing that AI literacy should combine technical, critical, and ethical dimensions (Ng et al., 2021; Miao et al., 2024).

Pendhalungan Culture and the Logic of Cultural Negotiation

The Pendhalungan context is theoretically significant because it foregrounds negotiation. The literature does not portray Pendhalungan as a completely homogeneous culture; rather, it is associated with historical interaction, acculturation, linguistic variation, and plural cultural identities (Satrio et al., 2021; Ilham, 2024). This makes it a productive lens for examining AI

transformation. New technology enters a cultural environment that already possesses mechanisms for adapting, translating, selecting, and combining influences.

The implication is that culturally responsive AI education should not merely insert local symbols into technologically designed lessons. It should invite students to examine how technology interacts with lived culture. For example, an AI-supported project on local history can require students to interview community members, compare oral narratives with documentary sources, and use AI only for transcription, organization, or presentation. The cultural knowledge remains grounded in human experience, while AI provides a supplementary function. This model is compatible with recent work on Pendhalungan learning resources that emphasizes cultural identity, communication, preservation, and cultural diversity as educational topics (Piwulang, 2025).

Implications for Teachers and School Policy

The findings have four practical implications. First, teachers need AI literacy that goes beyond operating software. UNESCO's teacher competency framework emphasizes technical, ethical, pedagogical, and human-centred competencies (UNESCO, 2024). Second, schools need explicit norms for responsible AI use, including age appropriateness, privacy, source verification, disclosure of AI assistance, and assessment design. Third, Islamic education can become a strategic site for developing critical AI literacy because it already addresses truthfulness, responsibility, ethical conduct, and social relationships (Nur Hasanah & Kristiyah, 2023). Fourth, local culture should be incorporated into AI-supported learning so that technological modernization does not become cultural homogenization.

Assessment also needs adaptation. Assignments that can be completed entirely through automated text generation are less effective for evaluating individual reasoning (Najwa & Nur Hasanah, 2026). Teachers can instead combine AI-assisted tasks with oral explanation, reflection journals, collaborative problem solving, source comparison, and locally grounded projects. This is consistent with research emphasizing the need to redesign assessment and academic-integrity practices in response to generative AI (Cotton et al., 2024; Deng et al., 2025).

The interpretation is also consistent with several complementary strands of scholarship. Ouyang and Jiao (2021) distinguish different paradigms of AI in education, reminding researchers that AI can be designed to support teachers, learners, or system-level decision making. Ng et al. (2021) and Miao et al. (2024) broaden AI literacy from technical operation toward critical and ethical competencies, while Almasri (2024) and Albadarin et al. (2024) demonstrate the rapidly expanding empirical literature on AI and generative AI in educational settings. At the policy level, UNESCO (2023, 2024) and the U.S. Department of Education (2023) emphasize human-centred implementation, teacher agency, safety, and responsible use. From a cultural perspective, Berry (2005), Arrovia (2021), Prayogi (2022), Ilham (2024), and Puspandari and Tricahyaningati (2026) support an understanding of cultural identity as dynamic, negotiated, and context-dependent. Selwyn (2019) further cautions that educational technology should be judged in relation to educational purposes and social relations rather than technological novelty alone.

Limitations and Future Research

The study has several limitations. First, it is a bounded qualitative case and therefore does not provide statistical generalization to other schools. Second, the findings describe perceived and observed patterns rather than long-term effects of AI use on achievement, character, or cultural identity. Third, the study does not isolate the effects of particular AI platforms, and different systems may produce different outputs and risks. Fourth, the Pendhalungan category itself is internally diverse; treating it as a uniform identity would oversimplify the cultural setting. Future research should therefore compare several schools across the Pendhalungan region, examine differences between teachers and students, and investigate longitudinal changes in AI literacy, religious reasoning, academic integrity, and cultural engagement. Mixed-method and participatory research could further examine whether culturally grounded AI curricula produce measurable changes in students' critical evaluation and responsible use.

Conclusion

This study examined AI-mediated social transformation in Islamic education through the Pendhalungan cultural context of SD Negeri Sukabumi 2 Probolinggo City. The findings indicate that AI expands access to learning resources, supports material development and communication, and creates new opportunities for exploration. At the same time, it introduces concerns involving information verification, academic integrity, digital dependence, interpersonal interaction, and cultural identity. These outcomes show that AI is not simply a neutral classroom instrument; its educational meaning is shaped by how teachers, students, religious values, and local culture negotiate its use.

The study contributes a contextual understanding of responsible AI integration in which four principles are connected: human agency, Islamic ethical mediation, social solidarity, and cultural responsiveness. Within Islamic education, AI should support rather than replace human judgment, teacher guidance, religious scholarship, and interpersonal learning. Within the Pendhalungan context, technological innovation can be negotiated through the same broader practices of cultural interaction and adaptation that characterize the region. The practical implication is that schools should cultivate AI literacy together with ethical reasoning, verification skills, academic integrity, and respect for cultural diversity.

The central proposition is therefore not that Islamic education must choose between technology and tradition. Rather, it can become a space in which technological change is critically interpreted and ethically directed. Future educational development should place AI within a broader formation of responsible persons who can use technology creatively while remaining accountable to truth, human dignity, community, religious values, and the cultural contexts in which learning takes place.

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Conflict of Interests

The author declares that there is no conflict of interest.

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