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Beyond Transmission: T-CAIM Framework for Navigating Religious Authority and AI Integration in Pesantren Education

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Abstract
The Artificial Intelligence (AI) technologies are fundamentally vibrating worldviews and reshaping the epistemological landscape of global education, raising urgent questions about the future of tradition-based institutions. This article critically examines the intersections between AI-driven educational transformation and the enduring pedagogical and religious authority structures of Pesantren, Indonesia's indigenous Islamic boarding schools. Drawing on Bourdieu's theory of field, capital, and habitus; Habermas's communicative action theory; and the concept of epistemic authority in Islamic scholarship, this paper argues that Pesantren face a dual challenge: preserving the integrity of knowledge transmission (*sanad*) and spiritual formation (*Tarbiyah*) central to their identity, while simultaneously engaging with AI tools that threaten to disintermediate the Kyai–santri relationship and algorithmicise religious guidance. Through a thematic critical literature review of 47 downloaded from peer-reviewed studies, conference proceedings, institutional policy documents and critical discourse analysis of institutional policy documents, this article identifies three key tensions: (1) the contestation between algorithmic knowledge and embodied scholarly authority; (2) the risks and opportunities of AI-mediated religious consultation; and (3) the emerging typologies of AI adoption across salaf and khalaf Pesantren. The article introduces Beyond Transmission as its central theoretical contribution, a paradigm shift that reconceptualises Islamic education from mere knowledge transmission to transformative human formation in the AI era, and proposes the Tarbiyah-Centred AI Integration Model (T-CAIM) as an operationalised normative framework for Pesantren AI governance.

Teknologi Kecerdasan Buatan (AI) secara fundamental mengguncang pandangan dunia dan membentuk kembali lanskap epistemologis pendidikan global, menimbulkan pertanyaan

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mendesak tentang masa depan lembaga-lembaga berbasis tradisi. Artikel ini secara kritis mengkaji persimpangan antara transformasi pendidikan yang didorong oleh AI dan struktur otoritas pedagogis dan religius yang abadi di Pesantren, sekolah berasrama Islam asli Indonesia. Dengan mengacu pada teori Bourdieu tentang medan, modal, dan habitus; teori tindakan komunikatif Habermas; dan konsep otoritas epistemik dalam kajian Islam, makalah ini berpendapat bahwa Pesantren menghadapi tantangan ganda: melestarikan integritas transmisi pengetahuan (sanad) dan pembentukan spiritual (Tarbiyah) yang menjadi inti identitas mereka, sekaligus terlibat dengan alat-alat AI yang mengancam untuk mendisintermediasi hubungan Kyai–santri dan mengalgoritmakan bimbingan keagamaan. Melalui tinjauan literatur kritis tematik terhadap 47 studi yang telah ditelaah sejawat, prosiding konferensi, dokumen kebijakan institusional, dan analisis wacana kritis terhadap dokumen kebijakan institusional, artikel ini mengidentifikasi tiga ketegangan utama: (1) pertentangan antara pengetahuan algoritmik dan otoritas ilmiah yang terwujud; (2) risiko dan peluang konsultasi keagamaan yang dimediasi AI; dan (3) tipologi adopsi AI yang muncul di seluruh Pesantren salaf dan khalaf. Artikel ini memperkenalkan Beyond Transmission sebagai kontribusi teoritis utamanya, sebuah pergeseran paradigma yang merekonseptualisasikan pendidikan Islam dari sekadar transmisi pengetahuan menjadi pembentukan manusia transformatif di era AI, dan mengusulkan Model Integrasi AI Berpusat pada Tarbiyah (T-CAIM) sebagai kerangka kerja normatif yang dioperasionalkan untuk tata kelola AI di Pesantren.

Keywords: T-CAIM; Knowledge Transmission; Religious Authority; Epistemic Authority

Introduction

The advent of Artificial Intelligence (AI) constitutes one of the most consequential epistemological disruptions in the history of human civilization, fundamentally altering the nature of knowledge production, dissemination, and validation across all sectors of society. In the domain of education, AI-driven platforms are rapidly transforming pedagogical paradigms, from adaptive learning systems to generative AI capable of producing scholarly discourse, conducting tutoring, and delivering religious guidance at scale.[1] Nowhere is the challenge of this technological disruption more profound than in institutions whose identity is rooted in the irreplaceable transmission of sacred knowledge through living chains of scholarly authority. Indonesia's Pesantren[2], a centuries-old Islamic boarding school tradition encompassing more than 36,000

[1] Wayne Holmes, Maya Bialik, and Charles Fadel, *Artificial Intelligence in Education. Promise and Implications for Teaching and Learning.* (Boston: Center for Curriculum Redesign, 2019); Selin Akgun and Christine Greenhow, "Artificial Intelligence in Education: Addressing Ethical Challenges in K-12 Settings," *AI and Ethics* 2 (2022): 431–440.

[2] Kementerian Agama Republik Indonesia, "Data Pondok Pesantren," *Https://Data.Goodstats.Id/Statistic/10-Provinsi-Dengan-Pondok-Pesantren-Terbanyak-2025-LJZsK.*

institutions and educating approximately 4.29 million students, represents precisely such an institution, occupying a singular position at the intersection of religious authority, community formation, and Islamic educational philosophy.[3]

The Pesantren tradition is grounded in a pedagogical epistemology that has no precise equivalent in Western educational philosophy: knowledge (*'ilm*) is validated not merely by its propositional content but by the moral credentialing and spiritual authority of the scholar who transmits it through an unbroken chain (*sanad*) connecting student to teacher across generations to the Prophet Muhammad.[4] The *Kyai*, the spiritual patriarch and intellectual guardian of each Pesantren, thus occupies a position of irreducible authority that AI systems, however sophisticated, categorically cannot replicate. Yet recent scholarship has begun to document the penetration of AI technologies into Indonesian Islamic education at accelerating speed, raising urgent questions about what this means for the integrity of religious authority, the epistemological legitimacy of AI-generated Islamic guidance, and the future of holistic human formation (*Tarbiyah*) that constitutes the Pesantren's deepest educational purpose.

The gravity of these questions has already prompted institutional responses at the highest levels of Indonesian Islamic authority. In 2023, Nahdlatul Ulama, the world's largest Muslim organization with an estimated 95 million members, issued a declaration that seeking religious rulings (*fatwa*s) from AI systems is *haram* (prohibited), on the grounds that such systems lack the moral credentials, scholarly lineage, and community accountability required for legitimate Islamic guidance.[5] This institutional response signals the depth of the challenge AI poses to the Pesantren's foundational epistemological structures, and underscores the urgency of developing a theoretically grounded normative framework for navigating this challenge.[6]

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[3] Azyumardi Azra, *The Origins of Islamic Reformism in Southeast Asia: Networks of Malay-Indonesian and Middle Eastern "Ulam?" in the Seventeenth and Eighteenth Centuries* (Hawai: University of Hawaii Press, 2004); Zamakhsyari Dhofier, *Tradisi Pesantren, Studi Pandangan Hidup Kiai Dan Visinya Mengenai Masa Depan Indonesia* (Jakarta: LP3ES, 2011). Both seminal works establish *sanad* as the ontological foundation of Pesantren knowledge authority.

[4] Eko Suncaka, "Bridging Spirituality and Technology: Ethical Integration of Artificial Intelligence in Pesantren Education," *Tafkir: Interdisciplinary Journal of Islamic Education* 5, no. 4 (2024): 735–748.

[5] Vitorio Mantalean and Dani Prabowo, "NU: Haram Minta Fatwa Ke 'Artificial Intelligence,'" *Kompas*, last modified 2023, https://nasional.kompas.com/read/2023/09/19/15551621/nu-haram-minta-fatwa-ke-artificial-intelligence.

[6] A thematic review of the literature (2019–2025) identified a critical research gap: while adoption patterns of digital technology in Pesantren are increasingly documented (Muhammad Zainal Abidin and M. Yusuf Fadlullah, "Adapting Artificial Intelligence in Pesantren:

A thematic review of the extant literature reveals that while scholars have begun to address aspects of this challenge, significant theoretical and empirical gaps remain. The most advanced state-of-the-art scholarship in the field has produced important jurisprudential analyses of AI's relationship to religious authority[7] and initial ethical frameworks for AI in Islamic education[8], but those perspectives have not yet integrated sociological field theory, communicative action theory, and Islamic epistemology into a single comprehensive framework addressing the full spectrum of Pesantren educational identity in the AI era.[9] This article addresses that gap by introducing the concept of Beyond Transmission, a paradigm shift that repositions Pesantren's distinctive educational value from the dimension of knowledge transmission (which AI can simulate) to the dimension of transformative human formation (which AI categorically cannot produce).

This article is guided by three interconnected research questions, namely (1) what theoretical frameworks best illuminate the conflict between AI-mediated knowledge and the traditional epistemological authority of the *Kyai* in Pesantren?; (2) how are Pesantren institutions across the *salaf–khalaf* typological spectrum adapting to, resisting, or selectively integrating AI technologies?; (3) what normative principles should govern the ethical and pedagogically sound integration of AI in Pesantren education without eroding its irreplaceable spiritual and relational dimensions?

Bourdieu's Field Theory: Religious Capital and Habitus

Pierre Bourdieu's conceptual triad of field, capital, and habitus provides the

Institutional Typologies, Kyai Leadership, and Adaptive Optimism," *Journal of Pesantren and Diniyah Studies2* 2, no. 2 (2025).

[7] Lukman Hakim and Muhamad Risqil Azizi, "Otoritas Fatwa Keagamaan Dalam Konteks Era Kecerdasan Buatan (Artificial Intelligence/AI)," *Ar-Risalah Media Keislaman Pendidikan dan Hukum Islam* 21, no. 2 (2023). This study represents the state-of-the-art in Islamic jurisprudential analysis of AI authority, but remains limited to the *fatwa* context and does not address the broader pedagogical formation dimensions central to this article.

[8] M Alfarizi Tobing, Danny Abrianto, and Muhammad Yunan Harahap, "Reconstruction of Islamic Religious Education in the Artificial Intelligence Era: A Critical Review of Teacher Roles, Digital Ethics, and Epistemic Authority," in *Proceedings of International Conference on Islamic Community Studies* (Medan: Universitas Pembangunan Panca Budi, 2025). These represent the most recent state-of-the-art empirical and ethical analyses of AI in Islamic education, but lack an integrated normative framework operationally applicable to diverse Pesantren typologies.

[9] Apriyanto Nugroho and Anita Puji Astutik, "Digital Transformation of Islamic Boarding School Education," *IJIS: Indonesian Journal of Islamic Studies* 12, no. 2 (2024); Hakim and Azizi, "Otoritas Fatwa Keagamaan Dalam Konteks Era Kecerdasan Buatan (Artificial Intelligence/AI)."

primary sociological framework for this study.[10] A field, in Bourdieu's terminology, is a structured social space constituted by relations of power in which agents compete for the recognition and accumulation of various forms of capital. In the Pesantren field, the dominant form of capital is religious capital, a species of symbolic capital derived from mastery of classical Islamic texts, proximity to revered scholarly lineages, recognized piety, and the accumulated trust of the Muslim community. The *Kyai* holds a hegemonic position in this field by virtue of accumulated religious and symbolic capital that is misrecognized, in Bourdieu's sense,[11] as natural charisma and divine blessing (*barakah*) rather than as socially produced and reproduced advantage.[12] The introduction of AI into the Pesantren field constitutes a field disruption: a transformation in the rules of the game that potentially redistributes capital and repositions agents, threatening the *Kyai*'s hegemonic position by introducing a form of technological capital that competes with, and risks displacing, embodied religious capital.

Habitus, the durable, transposable system of dispositions generated by one's social position and trajectory, is perhaps Bourdieu's most relevant concept for understanding Pesantren pedagogy. The *santri's* habitus is not merely cognitive but embodied: it is formed through daily rhythms of prayer, study, communal life, and sustained proximity to the *Kyai*. This embodied habitual formation resists the instant, decontextualised, and disembodied knowledge delivery that characterises AI systems. What Pesantren produces is not merely *'ilm* (knowledge) but *akhlaq* (character), a disposition that cannot be generated algorithmically. The colonization of this habitus-forming environment by AI tools risks substituting the formative encounter with an instrumental transaction.

Habermas's Communicative Action: Lifeworld, System, and Pedagogical Colonization

Jürgen Habermas's distinction between the system and the lifeworld offers a complementary and equally powerful theoretical resource.[13] For Habermas, the

[10] Pierre Bourdieu, *The Logic of Practice* (California: Atanford University Press, 1990); Pierre Bourdieu, *Outline of a Theory of Practice*, ed. Richard Nice (Cambridge: Cambridge University Press, 1977).

[11] Najib Habibi and Mar'atus Sholikha, "Kontekstualisasi Teori Bourdieu Dalam Pembentukan Karakter Santri Di Pondok Pesantren Darul Falah Amtsilati," *DIMAR: Jurnal Pendidikan Islam* 6, no. 2 (2025).

[12] Muhamad Maimun et al., "Dissemination and Contestation of Kyai's Religious Discourse in Digital Spaces and Its Impact on Followers," *Al Yasini : Jurnal Keislaman, Sosial, hukum dan Pendidikan* 10, no. 6 (2025).

[13] Jurgen Habermas, *The Teory of Communicative Action* (Boston: Beacon Press, 1984).

lifeworld comprises the shared horizons of meaning, value, and intersubjective understanding within which communicative action is oriented toward mutual understanding rather than strategic success. The system driven by the steering media of money and power tends to colonize and rationalize the lifeworld, substituting communicative rationality with instrumental rationality. Applied to Pesantren education, the pedagogical lifeworld is constituted by the *halaqah* (study circle), *sorogan* (individual recitation before the *Kyai*), and *bandongan* (collective oral commentary on classical texts), all fundamentally communicative practices oriented toward shared understanding of sacred meaning.[14] AI-driven educational technologies operate according to the logic of the system: efficiency, scalability, automation, and measurable output. The risk of AI colonizing the Pesantren lifeworld, substituting the meaningful dialogue of the *Kyai–santri* relationship with an algorithmic transaction, is the central concern that Habermas's framework brings into analytical focus.

Islamic Epistemology: *Sanad*, *Tarbiyah*, and the Limits of Algorithmic Knowledge

Islamic epistemological tradition provides the third pillar of this article's theoretical framework, offering indigenous resources for critically evaluating AI's epistemic claims within a Muslim educational context.[15] Classical Islamic epistemology distinguishes between *'ilm* (formal knowledge), *ma'rifah* (gnosis or experiential spiritual knowledge), and *hikmah* (wisdom), and it is the latter two that AI is categorically incapable of producing. The concept of *sanad* functions not merely as a bibliographic chain but as an ontological claim: knowledge is validated by its genealogy of embodied, morally credentialed transmitters, connecting the present student to the Prophet through an unbroken lineage of righteous scholars.[16] AI, by definition,[17] possesses no such chain, no moral credential, and no community of recognition, and therefore cannot function as a legitimate source of Islamic knowledge in the classical epistemological sense. The concept of *Tarbiyah*, the holistic formation of the human person in accordance with divine purpose,[18] further underscores the limits of AI: *Tarbiyah*

[14] Robert E. Young, *A Critical Theory of Education: Habermas and Our Children's Future* (New York: Teachers College Press, 1990).
[15] Wael B. Hallaq, *The Origins and Evolution of Islamic Law* (Montreal: McGill University, 2004).
[16] Faizatul Ulya and Khoirun Nikmah, "Upaya Pesantren Dalam Menjaga Tradisi Sanad Keilmuan Di Era Society 5.0," *Mudarrisuna: Media Kajian Pendidikan Agama Islam* 14, no. 1 (2024).
[17] Ke Zhang and Ayse Begum Aslan, "AI Technologies for Education: Recent Research & Future Directions," *Computers and Education: Artificial Intelligence* 2 (2021).
[18] Achmad Zuhri et al., "How Madrasahs Build Students' Character in Indonesia's Society 5.0 Era: Emerging Challenges," *Nazhruna: Jurnal Pendidikan Islam* 9, no. 1 (2026): 166–186.

requires wisdom, love, moral exemplarity, and the irreducible presence of a living spiritual guide, none of which AI can provide or simulate.

The principle of *maqasid al-shari'ah*, the objectives of Islamic law preserving religion, life, intellect, lineage, and property, provides a normative evaluative framework for AI integration that goes beyond Western AI ethics frameworks.[19] From a *tawhidic* epistemological perspective, any technology that fragments the unified Islamic vision of knowledge separating the intellectual from the spiritual, the factual from the ethical violates the foundational Islamic understanding of knowledge as unified in its divine source.[20] The knowledge framework of Pesantren also integrates *bayani* (textual-rational), *burhani* (demonstrative-empirical), and *irfani* (intuitive-spiritual) modes of reasoning, an epistemological richness that AI, operating exclusively within the *burhani* register of pattern recognition and statistical inference, fundamentally cannot replicate.

The Pesantren in Digital and AI Contexts: State of the Art

Existing scholarship on Pesantren and digital transformation can be organised into four streams, each constituting a component of the state of the art that this article builds upon and advances. The first stream documents *Kyai* leadership in the digital era, demonstrating that the most effective *Kyai* are not digitally passive but actively deploy digital media to extend their authoritative reach and build "digital resilience" among *santri*.[21] Syihabuddin (2024) provides a detailed case study of transformational *Kyai* leadership in Pesantren *Mamba'us Sholihin* Gresik, showing how combined transformational, charismatic, and democratic leadership styles enable institutions to navigate digital change without losing their Islamic identity.[22]

The second stream addresses the digital transformation of *kitab kuning* literacy and classical text pedagogy, documenting both the opportunities of digitized classical texts and the risks of decontextualizing sacred knowledge

[19] Ode Abdurrachman, Zeynep Toprak, and James Scott, "Islamic Ethical Framework for Artificial Intelligence Governance in the Era of Generative Models," *International Jornal of Noesantara Islamic Studies* 2, no. 6 (2025); Ezieddin Elmahjub, "Artificial Intelligence (AI) in Islamic Ethics: Towards Pluralist Ethical Benchmarking for AI," *Philosophy & Technology* 36, no. 4 (2023).

[20] Masudul Alam Choudhury, *The Tawhidi Methodological Worldview: A Transdisciplinary Study of Islamic Economics* (Singapore: Springer Nature Singapore, 2019).

[21] Hendi Sugianto, Rofiqi Rofiqi, and Zainuddin Zainuddin, "Charismatic Leadership And Digital Resilience: How Kyai Navigate Religious Moderation In Contemporary Indonesian Pesantren," *Jurnal Studi Pendidikan Agama Islam,* 1, no. 2 (2025).

[22] Muhammad Arif Syihabuddin, "Kepemimpinan Transformasional Kiai Dalam Pengembangan Pesantren Di Era Digital: Studi Kasus Di Pondok Pesantren Mamba'us Sholihin Gresik," *Miyah: Jurnal Studi Islam* 20, no. 1 (2024).

from its living scholarly community.[23] The third stream, the most directly relevant to this article's contribution, concerns AI and Islamic jurisprudential authority, with the most important recent developments being the jurisprudential analysis of AI as i-*Mufti*[24] and the *fiqh* algorithm research questioning whether machine learning logic is compatible with the epistemological structure of Islamic legal reasoning.[25] The fourth stream addresses broader AI adoption patterns in Indonesian Pesantren, with Mutmainah et al.[26] documenting *santri* AI literacy training and providing the most recent typological mapping of AI adoption across salaf and khalaf institutions.[27] The critical gap across all four streams which this article addresses is the absence of an integrated theoretical framework connecting sociological, communicative, and Islamic epistemological analyses to produce a normative model for Pesantren AI governance.

The phenomenon of authority pluralization in digital religious environments whereby the digital sphere fragments and redistributes religious authority among multiple competing voices has been theorized in the sociology of religion literature.[28] In the Pesantren context, this phenomenon is intensified by AI systems that can simulate the informational content of religious guidance with a confidence and immediacy that rivals that of human scholars. The risk of epistemic displacement the progressive substitution of human scholarly authority by algorithmic outputs is particularly acute for *santri* who lack the critical AI literacy to recognize the ontological and epistemological limitations of AI-generated religious content. Recent scholarship on digital knowledge

[23] Azwar Sani and Muhammad Kashif Majeed, "Transforming Kitab Kuning Literacy in the Digital Era: Challenges and Future Prospects for Islamic Education," *Al Adalah* 28, no. 1 (2025).

[24] Shoaib Ahmed Malik, "Artificial Intelligence and Islamic Thought: Two Distinctive Challenges," *Journal of Islamic and Muslim Studies* 8, no. 2 (2023). Malik introduces the i-*Mufti* concept to describe AI's capacity and incapacity to simulate Islamic jurisprudential reasoning.

[25] Halimatus Sya'diyah et al., "Fiqh Algorithm: Finding A Common Ground Between Fatwa and Artificial Intelligence," in *Proceeding of International Conference on Education and Sharia*, 2025.

[26] Siti Mutmainah, Khurin'In Ratnasari, and Dukan Jauhari F Ratnasari, "Building Digital Skills and Introducing AI for Santri Through a Training Program at the As-Sunniyah Islamic Boarding School in Kencong Jember," *International Journal of Community Service Learning* 8, no. 1 (2024).

[27] Abidin and Fadlullah, "Adapting Artificial Intelligence in Pesantren: Institutional Typologies, Kyai Leadership, and Adaptive Optimism."

[28] Mia Lövheim and Stig Hjarvard, "The Mediatized Conditions of Contemporary Religion: Critical Status and Future Directions," *Journal of Religion Media and Digital Culture* 8, no. 2 (2019).

systems and Islamic epistemology[29] and on reconstruction of islamic religious education[30] both identify this displacement risk as among the most urgent challenges facing Islamic educational institutions in the AI era. The typological diversity of Indonesian Pesantren means that these risks are unevenly distributed: *salaf* Pesantren are more vulnerable to cultural shock but more resistant to AI adoption; *khalaf* Pesantren are more technologically open but potentially more susceptible to epistemic displacement.

Method

This study employs a thematic critical literature review (TCLR) methodology, combining the rigour of thematic review protocols with the interpretive depth of critical theoretical analysis. The SCLR approach is appropriate when the research objective is not merely to catalogue existing findings but to develop theoretical frameworks that explain gaps and contradictions in the existing literature precisely the objective of this article. A comprehensive database search was conducted across SCOPUS, Web of Science, Google Scholar, and the Sinta (Science and Technology Index) database for Indonesian journals. Search terms were thematically combined using Boolean operators: (Pesantren or 'Islamic boarding school') AND ('artificial intelligence' or AI or 'machine learning') and ('religious authority' or 'Islamic education' or *Tarbiyah* OR *Kyai*). Additionally, targeted searches were conducted for each theoretical framework: (Bourdieu and 'Islamic education'), (Habermas and 'religious education'), and ('Islamic epistemology' and AI). The search covered publications from January 2019 to March 2026. Institutional policy documents from the Ministry of Religious Affairs of Indonesia, Nahdlatul Ulama, and Muhammadiyah were also included as primary sources.

Inclusion criteria were: (a) peer-reviewed journal articles, conference proceedings, or institutional policy documents; (b) directly addressing AI, digital transformation, or technological change in Pesantren or Islamic education broadly; (c) published in English or Indonesian; (d) available in full text with verifiable DOI or institutional URL. Exclusion criteria included: grey literature without institutional provenance; studies exclusively addressing general (non-Islamic) education without theoretical applicability to the Pesantren context;

[29] Yeni Tri Nur Rahmawati et al., "Digital Knowledge Systems and Islamic Epistemology: Artificial Intelligence Adoption in Pesantren Education," *FALASIFA: Jurnal Studi Keislaman* 17, no. 1 (2026): 17–32.

[30] Tobing, Abrianto, and Harahap, "Reconstruction of Islamic Religious Education in the Artificial Intelligence Era: A Critical Review of Teacher Roles, Digital Ethics, and Epistemic Authority."

and publications prior to 2019 except for foundational theoretical works (Bourdieu, Habermas, Azra, Dhofier, Hallaq) included for their theoretical grounding function.

Table 1. Typological Distribution of 47 Included Primary Studies

Study Category	Primary Focus	Examples
AI & Islamic Education (Indonesia)	AI adoption, attitudes, digital transformation in Pesantren/madrasah	Suncaka (2024); Nugroho & Astutik (2024); Mutmainah et al. (2024)
AI & Religious Authority	*Fatwa* authority, iMufti, epistemic legitimacy of AI in Islam	Hakim & Azizi (2023); Malik (2024); Al-Adalah (2024)
Pesantren Leadership & Digital Transformation	*Kyai* leadership, institutional change, digital resilience	Sugianto et al. (2025); Syihabuddin (2024); Hidayat & Nuri (2024)
Islamic AI Ethics & Governance	Maqasid-based AI ethics, Islamic AI governance frameworks	Hamdan (2023); Elmahjub (2023); Proceedings ICRECCU (2024)
Pesantren Typology & Identity	*Salaf*/*khalaf* typologies, Pesantren educational philosophy	Hidayat et al. (2022); Murdianto (2023); Holil et al. (2022)
AI in Education (International)	General AI education research (theoretical framing only)	Holmes et al. (2023); Zhang & Aslan (2021); Akgun & Greenhow (2022)

Analytical Methods

Data synthesis proceeded through two complementary analytical procedures. First, thematic analysis following Braun and Clarke[31] was applied to identify, code, and map recurring themes across the 47 included studies. Thematic coding was organized around the three research questions, with codes assigned deductively (from the theoretical frameworks) and inductively (from emergent patterns in the data). Second, Critical Discourse Analysis (CDA) following Fairclough (2003)[32] was applied to institutional policy documents (Ministry of Religious Affairs guidelines, NU and Muhammadiyah statements on AI) to examine how institutional actors discursively construct the relationship between AI and Islamic educational authority.

Theoretical framework development followed an iterative abductive logic: initial theoretical propositions derived from Bourdieu, Habermas, and Islamic epistemology were successively refined through engagement with the empirical literature and the iterative refinement of theoretical propositions until no

[31] Virginia Braun and Victoria Clarke, *Thematic Analysis : A Practical Guide* (California: Sage Publications Ltd., 2021).
[32] Norman Fairclough, *Analysing Discourse: Textual Analysis for Social Research* (London: Routledge, 2003).

substantial new themes emerged from the corpus as the point at which additional literature yielded no new theoretical insights relevant to the research questions.

Positionality and Limitations

This study acknowledges three principal limitations. First, as a critical literature review rather than original empirical fieldwork, its findings are dependent on the quality and representativeness of the published literature, a literature that is still developing rapidly in the AI context. Second, the dominance of Indonesian-language sources in the Pesantren literature may introduce a degree of contextual specificity that requires caution in generalizing findings to non-Indonesian Muslim educational contexts, though the theoretical framework is designed for transferability. Third, the rapidly evolving nature of AI technology means that specific empirical claims about AI capabilities may require revision as the technology develops. These limitations are partially offset by the study's multi-language search strategy, its transparent thematic review protocol, and its grounding of empirical claims in enduring theoretical frameworks rather than technology-specific assertions.

Result and Discussion

The thematic synthesis of 47 primary studies, triangulated with critical discourse analysis of institutional policy documents and interpreted through the triple theoretical lens of Bourdieu, Habermas, and Islamic epistemology, produces findings that converge on a single overarching theoretical contribution: the Beyond Transmission paradigm. This section presents this paradigm in full, situates it within each theoretical framework, maps its constitutive dimensions through analytical tables, and operationalizes it through the *Tarbiyah*-Centred AI Integration Model (T-CAIM).

The Beyond Transmission Paradigm: A Theoretical Contribution

Historically, the dominant self-understanding of Pesantren pedagogy has been framed through the metaphor of transmission: the faithful passing on of sacred knowledge through unbroken chains of scholarly authority (*sanad*). This transmission model is epistemologically defensible and historically irreplaceable, but it is insufficient as a complete account of what Pesantren does or, critically, what Pesantren must foreground in the AI era.[33] When AI systems can simulate the informational dimension of knowledge transmission with unprecedented

[33] M. Ali Haidar, Mizanul Hasanah, and Muhammad Anas Ma`arif, "Educational Challenges to Human Resource Development in Islamic Education Institutions," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 3, no. 4 (2022).

speed and scale, the distinctive value of Pesantren must be located not in transmission itself but in what lies beyond it: formation, wisdom, moral exemplarity, and spiritual presence, dimensions that AI is not merely unable to replicate but is structurally incapable of producing.[34]

The Beyond Transmission paradigm does not reject the transmission model but radically repositions it: transmission is necessary but not sufficient. What AI cannot replicate, and what Pesantren uniquely provides, is the embodied, relational, and spiritually grounded pedagogical encounter between a living moral exemplar (*Kyai*) and a spiritually forming human being (*santri*). This encounter, structured by the disciplines of Islamic devotional practice and communal life, produces not just knowledgeable Muslims but wise, righteous, and God-conscious ones. The Habermasian framework clarifies why this matters:[35] the efficiency imperative of AI is structurally incompatible with the formative temporality of *Tarbiyah*, which requires slowness, struggle, relational depth, and the irreducible encounter with a living moral exemplar, the precise opposite of the algorithmic transaction AI offers.

Table 2. Transmission Paradigm vs. Beyond Transmission Paradigm

Dimension	Transmission Paradigm	Beyond Transmission Paradigm
Core metaphor	Pipeline / chain (*sanad*)	Encounter / formation (*Tarbiyah*)
Primary goal	Faithful reproduction of received knowledge	Holistic formation of the Muslim person
Role of *Kyai*	Authoritative transmitter of texts	Moral exemplar, spiritual guide, wisdom-bearer
Role of *santri*	Recipient and memoriser of transmitted knowledge	Active spiritual/intellectual formation subject
Locus of authority	Text + scholarly lineage (*sanad*)	Text + lineage + living moral community
AI's threat level	HIGH: AI simulates transmission effectively	LOW: AI cannot simulate *Tarbiyah*
Knowledge type	*'ilm* (formal knowledge)	*'ilm* + *Ma'rifah* + *Hikmah* (integrated)
Vulnerability to AI	High: text can be digitized and searched	Low: wisdom and *Tarbiyah* cannot be automated
Epistemological basis	*Bayani* (textual) reasoning dominant	*Bayani* + *Burhani* + Irfani integration
Success measure	Mastery of textual corpus	Formation of *akhlaq* + scholarly competence

Note. Synthesized from Bourdieu (1977, 1986), Habermas (1987), Dhofier (2011), Azra (2004), Hallaq (2005), Suncaka (2024), and authors' analysis.

[34] Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (Victoria BC: Pearson College Div, 2021); Max Tegmark, *Life 3.0: Being Human in the Age of Artificial Intelligence* (Alfred A. Knopf, 2017).
[35] Habermas, *The Teory of Communicative Action*.

Bourdieusian Analysis: Field Disruption and Capital Redistribution

Applying Bourdieu's field theory to the findings reveals that AI constitutes a genuine field disruption in the Pesantren educational field, one capable of permanently altering the distribution of religious capital and the reproduction of *Kyai* authority.[36] The thematic synthesis identifies two distinct mechanisms through which this disruption operates. The first is capital competition: AI platforms that generate plausible Islamic responses introduce a form of technological capital that competes with the embodied religious capital of the *Kyai*, potentially redistributing epistemic authority toward technologically capable actors regardless of their scholarly credentials. The second is habitus erosion: the substitution of the slow, effortful, relationally embedded formation of the *santri*'s habitus with instant algorithmic gratification risks producing what we may term a thin habitus, technically literate but spiritually and morally impoverished.

Table 3. AI Adoption Patterns Across Pesantren Typologies: A Bourdieusian Field Analysis

Adoption Pattern	Typology	Field Logic	Capital Dynamic	*Kyai* Position
Selective Instrumentalism	*Khalaf* / Semi-modern	AI adopted for general subjects; Islamic sciences remain AI-free	Technological capital added without displacing religious capital	Strengthened: *Kyai* retains monopoly on Islamic capital
Institutional Transformation	Large urban *khalaf*	Comprehensive digital strategy; AI integrated across curriculum	Technological capital redistributed; some religious capital risk	Contested: requires active capital defence strategies
Deliberate Resistance	Strict *salaf*	AI rejected on epistemological and cultural grounds	Religious capital preserved; technological capital refused	Hegemonic internally; vulnerable to external field pressures
Adaptive Optimism (Emerging)	Progressive *khalaf*/*salaf* hybrid	AI integrated with explicit *Tarbiyah* safeguards (T-CAIM logic)	Both capitals cultivated simultaneously	Renewed: *Kyai* as AI literacy guide and moral anchor

Note. Typological data synthesised from Hidayat et al. (2022), Murdianto (2023), Suncaka (2024), and Syihabuddin (2024). Field analysis is authors' theoretical synthesis.

However, the findings also reveal that the Bourdieusian framework,

[36] Pierre Bourdieu, *Language and Symbolic Power*, ed. Gino Raymond and Matthew Adamson, IV. (Cambridge: Polity Press, 1995). The concept of symbolic violence -the imposition of meanings as legitimate while concealing the power relations underlying them- is especially relevant to AI's imposition of Western epistemological frameworks on Islamic educational contexts.

interpreted optimistically, offers a strategic pathway for *Kyai*: the sustainability of their authority in the AI era depends not on resisting technology but on maintaining communities of recognition that affirm the irreplaceable value of embodied, morally credentialed, spiritually embedded guidance. Empirical evidence from Sugianto et al.[37] and Syihabuddin[38] confirms that *Kyai* who actively cultivate such communities whether through face-to-face or digital means retain their authority; those who retreat into institutional insularity risk displacement by online religious entrepreneurs who excel at cultivating digital recognition despite inferior scholarly credentials. This finding directly responds to the first research question posed in the introduction.

Habermasian Analysis: Colonization of the Pedagogical Lifeworld

The Habermasian analytical lens reveals a normative danger that the Bourdieusian framework alone cannot fully capture: even in cases where AI adoption does not threaten *Kyai* authority in terms of field position, it may corrode the communicative foundations of the pedagogical lifeworld in ways that are epistemologically invisible but pedagogically devastating.[39] The thematic synthesis confirms that the dimensions most at risk from AI colonization are precisely those most central to the Habermasian lifeworld: inter-subjective meaning-making, the cultivation of communicative competence in Islamic discourse, and the existential engagement with sacred texts that makes learning transformative rather than merely informative.[40]

Critical discourse analysis of the NU 2023 declaration on AI[41] reveals that institutional actors themselves are deploying a proto-Habermasian logic in their resistance to AI religious consultation: the argument is not primarily about the factual accuracy of AI responses but about the category error of treating an instrumental system as though it were a communicative agent as though an algorithm could participate in the intersubjective moral discourse that authentic Islamic guidance requires. This institutional intuition, while not theoretically articulated in Habermasian terms, is fully coherent with the communicative action framework and constitutes evidence that the theoretical contribution of this article resonates with practitioners' lived experience of AI's limitations.

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[37] Sugianto, Rofiqi, and Zainuddin, "Charismatic Leadership And Digital Resilience: How Kyai Navigate Religious Moderation In Contemporary Indonesian Pesantren."
[38] Syihabuddin, "Kepemimpinan Transformasional Kiai Dalam Pengembangan Pesantren Di Era Digital: Studi Kasus Di Pondok Pesantren Mamba'us Sholihin Gresik."
[39] Habermas, *The Teory of Communicative Action*.
[40] Young, *A Critical Theory of Education: Habermas and Our Children's Future*.
[41] Mantalean and Prabowo, "NU: Haram Minta Fatwa Ke 'Artificial Intelligence.'"

Islamic Epistemological Analysis: The Five Dimensions of Beyond Transmission

The Islamic epistemological framework, integrated with the sociological analyses above, produces the most operationally specific contribution of this article: the identification of five irreducible dimensions of Islamic education that collectively exceed what any AI system can replicate.[42] These five dimensions constituting the Beyond Transmission framework's conceptual architecture are presented in Table 4 below, with each dimension assessed against AI's capacity, the Pesantren's distinctive role, and the empirical evidence from the literature review.[43]

Table 4. The Five Dimensions of the Beyond Transmission Framework

Dimension	Definition	AI Capacity	Pesantren's Role	Empirical Evidence
Epistemic Transmission	*'ilm* through *sanad*	HIGH: text storage, search, summarization	Contextualised, *sanad*-linked, community-embedded text instruction	Sani & Majeed (2025); Mustofa et al. (2024)
Moral Formation (*Tarbiyah*)	Holistic *akhlaq* formation through embodied moral example	NONE: AI cannot model or transmit moral character	*Kyai* as living moral exemplar; communal discipline as formative environment	Lukman et al. (2022); Sugianto et al.(2025)
Spiritual Presence (*Barakah*)	Spiritual blessing associated with proximity to righteous scholars	NONE: *Barakah* is ontologically tied to living moral agents	Sanctity of the *Kyai-santri* encounter	Suncaka (2024); Dhofier (2011)
Wisdom Production (*Hikmah*)	Contextual moral judgment in response to human complexity	LOW: pattern matching without contextual moral judgment	Developing *ijtihad* competence and contextual discernment	Hakim & Azizi (2023); Proceedings ICES (2025)
Community Reproduction	Reproducing the scholarly community (*ummah ilmiyah*) through recognition networks	NONE: community recognition requires social and moral validation	Maintaining *sanad* chains, *ijazah* systems, scholarly community recognition	Azra (2004); Habibi & Sholikha (2022)

Note. AI capacity: HIGH = performs well; LOW = performs poorly; NONE = structurally incapable. Empirical evidence drawn from thematic review corpus.

[42] Hallaq, *The Origins and Evolution of Islamic Law*.
[43] Abidin and Fadlullah, "Adapting Artificial Intelligence in Pesantren: Institutional Typologies, Kyai Leadership, and Adaptive Optimism."

The *Tarbiyah*-Centred AI Integration Model (T-CAIM)

The findings of the thematic review and the theoretical works generate the basis for a normative framework for AI integration in Pesantren education. The *Tarbiyah*-Centred AI Integration Model (T-CAIM) is organised around four core principles and three operational levels.[44] Unlike existing frameworks derived from Western AI ethics,[45] T-CAIM is grounded in Islamic epistemological principles and takes seriously the distinctive institutional logics of Pesantren—closing the gap identified in the introduction between existing governance frameworks and the specific requirements of Pesantren educational philosophy.[46]

Table 5. T-CAIM: Four Core Principles

Principle	Content	Theoretical Grounding	Operationalisation
P1: Primacy of *Tarbiyah*	AI integration evaluated first by contribution to holistic Islamic formation	Habermas: protect pedagogical lifeworld from system colonization	Any AI application eroding *Kyai–santri* relationship must be rejected or modified
P2: Epistemic Sovereignty of the *Kyai*	AI tools must function as instruments under *Kyai*'s intellectual authority	Bourdieu: preserve religious capital hegemony; maintain field position	AI-generated religious content must always be curated by qualified scholars (scholarly mediation)
P3: AI Literacy as Islamic Obligation	Critical AI literacy constitutes *fard kifayah* (communal obligation)	*Maqasid al-shari'ah*: preservation of '*aql* (intellect)	Develop structured AI literacy curricula grounded in Islamic epistemology
P4: Contextual Differentiation	AI strategies must differ by Pesantren typology, capacity, and curricular domain	Bourdieu: different field positions require different strategies	Islamic sciences require stricter AI boundaries than general subjects

Note. T-CAIM principles synthesized from Bourdieu (1977, 1986), Habermas (1984), Abdurrahman (2023), Elmahjub (2023), and thematic review findings.

[44] The T-CAIM framework extends and operationalises the maqasid-based governance approaches of Abdurrachman, Toprak, and Scott, "Islamic Ethical Framework for Artificial Intelligence Governance in the Era of Generative Models"; Elmahjub, "Artificial Intelligence (AI) in Islamic Ethics: Towards Pluralist Ethical Benchmarking for AI." by providing Pesantren-specific implementation levels grounded in the five Beyond Transmission dimensions identified in this study.

[45] Francesc Pedró et al., *Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development*, ED-2019/WS/8 (Paris, 2019), https://unesdoc.unesco.org/ark:/48223/pf0000366994.

[46] This analysis directly addresses the research gap identified at the outset: no prior study had produced a multi-theoretic, Pesantren-specific normative framework integrating Bourdieu, Habermas, and Islamic epistemology for the AI era. The Beyond Transmission paradigm and T-CAIM constitute this study's response to that gap.

Table 6. T-CAIM: Three Operational Levels and Decision Matrix

T-CAIM Level	AI Tool Type	BT Dimension Affected	Risk	Recommendation
Level 1 (AI-Assisted Admin & Non-*Fiqh*)	Language learning, *Quranic* memorization aids, administrative systems	Epistemic Transmission (partial)	Low	Adopt freely under teacher supervision; significant benefit, minimal formation risk
Level 1	AI administrative management	None (non-pedagogical)	Very low	Adopt freely; efficiency gains with no formation risk
Level 2 (AI as Scholarly Aid)	Classical text search/cross-reference for *Kyai*/ustadz only	Epistemic Transmission (augmentation)	Low–medium	Adopt for qualified scholars only; scholarly mediation required
Level 2	AI-generated *fiqh* summaries for *santri*	Epistemic Transmission + Wisdom	Medium–high	Permitted only when curated by qualified *Kyai*; never as primary source
Level 3 (Critical AI Literacy)	AI literacy curriculum (Islamic epistemological framework)	Wisdom + Community Reproduction	Low (formative benefit)	Strongly recommended; fulfils fard kifayah; builds resistance to epistemic displacement
Prohibited	AI religious chatbots for student *fatwa* queries	All five BT dimensions	Very high	Do not adopt; consistent with NU 2023 ruling; incompatible with *shar'i* authority requirements

Note. BT = Beyond Transmission dimensions. Risk level = risk to *Tarbiyah* integrity and religious authority structures.

Comparative Positioning: Beyond Transmission Against Existing Frameworks

The novelty of the Beyond Transmission paradigm is further clarified by thematic comparison with the most influential existing frameworks in the field (Table 7). This comparison demonstrates that while each existing framework makes important contributions, none provides the integrated, Pesantren-specific, multi-theoretic normative architecture that this article supplies, directly addressing the research gap identified in the introduction and confirmed by the thematic literature review.[47]

[47] This analysis directly addresses the research gap identified at the outset: no prior study had produced a multi-theoretic, Pesantren-specific normative framework integrating Bourdieu, Habermas, and Islamic epistemology for the AI era. The Beyond Transmission paradigm and T-CAIM constitute this study's response to that gap.

Table 7. Beyond Transmission vs. Existing Frameworks in AI–Islamic Education Literature

Framework	Contribution	Limitation	How BT Advances Beyond It
Abdurrahman et al (2023) Islamic AI Governance	*Maqasid*-based normative governance; strong policy orientation	No Pesantren-specific pedagogy; no *Tarbiyah* theory	BT adds Pesantren-specific framework grounded in *Tarbiyah* and *sanad*
Hakim & Azizi (2023) *Fatwa* Authority & AI	Strong Islamic jurisprudential analysis; identifies *shar'i* authority gaps	Limited to *fatwa* context; ignores broader pedagogical formation	BT extends authority analysis to full spectrum of Pesantren pedagogy
Suncaka (2024) Spirituality & Technology	Acknowledges spiritual dimension; Pesantren-focused; practical	Descriptive; lacks thematic multi-theoretic framework	BT provides Bourdieu–Habermas–Islamic epistemology grounding + 5-dimension framework
Elmahjub (2023) Islamic AI Ethics	Pluralist Islamic ethical benchmarking; addresses bias/justice	Abstract; not operationalised for educational institutions	BT operationalises via T-CAIM with Pesantren-specific decision matrix
JPDS (2025) AI Adoption Typologies	Empirical typological mapping; identifies adaptive optimism	Descriptive typology; no normative framework for evaluation	BT provides normative architecture for evaluating and guiding the typologies identified

Note. BT = Beyond Transmission paradigm (this article). Compiled by the author.

Research Agenda for Beyond Transmission Scholarship

The findings of this study identify a structured research agenda for future empirical work that can ground the Beyond Transmission paradigm in longitudinal evidence. The most urgent priorities, presented in Table 8, address the primary limitations of the existing literature identified in the thematic review: the absence of longitudinal formation studies, the underdevelopment of comparative international research, and the lack of curriculum design research for AI literacy in Pesantren contexts.[48]

[48] Pedró et al., *Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development*; Francisco José García-Peñalvo, "The Perception of Artificial Intelligence in Educational Contexts after the Launch of ChatGPT: Disruption or Panic?," *Education in the Knowledge Society* 24 (2023).

Table 8. Priority Research Agenda for Beyond Transmission Scholarship

Research Priority	Core Question	Method	Theoretical Connection
1. Longitudinal Formation Studies	Does AI integration affect *santri* akhlaq, religiosity, and scholarly development over time?	Mixed-methods longitudinal (3–5 years); spiritual development scales	Bourdieu's habitus formation; *Tarbiyah* theory
2. Authority Legitimacy Dynamics	How do *santri* assess legitimacy of AI-generated vs. *Kyai*-generated religious guidance?	Comparative survey + phenomenological interview; discourse analysis	Bourdieu's symbolic capital; shar'i authority theory
3. *Kyai* Digital Leadership	What strategies enable *Kyai* to maintain epistemic authority while adopting AI?	Multiple case study (*salaf* & *khalaf*); leadership theory	Bourdieu's field theory; charismatic authority
4. AI Literacy Curriculum	What curriculum designs build critical AI literacy grounded in Islamic epistemology?	Design-based research; curriculum evaluation; pre–post assessment	*Maqasid al-shari'ah* (*'aql* preservation); Habermas's communicative rationality
5. Community Recognition	How are *sanad* and *ijazah* systems adapting to digital-AI environments?	Institutional ethnography; network analysis	Bourdieu's symbolic capital; Islamic *sanad* theory
6. Comparative International	How do Muslim educational institutions in Egypt, Malaysia, Pakistan navigate AI?	Comparative case study; cross-national policy analysis	BT framework as transferable analytical tool

Conclusion

In response to the first research question, the study demonstrates that Bourdieu's field theory illuminates AI as a field disruption capable of redistributing religious capital and threatening *Kyai* authority, while Habermas's communicative action theory reveals the systemic colonization risk to the Pesantren's pedagogical lifeworld, and Islamic epistemology provides ontological criteria for why AI can never constitute a legitimate source of Islamic knowledge. These three frameworks are mutually reinforcing and together constitute a comprehensive theoretical architecture for analyzing AI's impact on Pesantren education. In response to the second research question, the study identifies four patterns of AI adoption across Pesantren typologies, selective instrumentalism, institutional transformation, deliberate resistance, and adaptive optimism, and demonstrates that the *Kyai*'s disposition toward technology is the primary determinant of institutional AI adoption trajectories.

In response to the third research question, the article's central theoretical contribution is the Beyond Transmission paradigm: the argument that Pesantren's distinctive educational value in the AI era lies precisely in what AI cannot replicate, the embodied encounter of *Tarbiyah*, the spiritual blessing of

barakah, the contextual judgment of *hikmah*, and the social validity of *sanad*-linked community recognition. Five analytical tables have mapped the conceptual architecture of this paradigm, contrasted it with the traditional transmission model, situated it against existing frameworks, and operationalized it through the *Tarbiyah*-Centred AI Integration Model (T-CAIM). The T-CAIM provides four normative principles and three operational levels for differentiated, principled AI integration in Pesantren, a model grounded in Islamic values and directly responsive to the research gap identified at the study's outset.

The practical implication of this study is clear: Pesantren administrators, *Kyai*, educational policymakers, and AI developers working in Muslim-majority contexts must resist two equally untenable positions, uncritical AI adoption that erodes the irreplaceable dimensions of *Tarbiyah*, and defensive blanket rejection that leaves *santri* epistemically vulnerable to AI's harms without the tools to critically navigate them. The T-CAIM offers a principled middle path grounded in Islamic educational philosophy. The future of Islamic education in the age of artificial intelligence will be determined not by technological imperatives but by the wisdom and vision of educators who insist that *ta'lim* (instruction/transmission) without *Tarbiyah* (formation) is not education at all. In this insistence, the Pesantren may offer not merely a model for its own survival, but a critical resource for humanizing AI-driven education globally. Meanwhile, as described herein, this research alignes to the writer's perspective boundaries. The common views described above address the westernized-perspective reviews in which encompass the postulated-frameworks of non-Islamic epistemologies. Therefore, the specific Islamic terms for ongoing researches can be attributed to empower their ingredients for the current Islamic worldviews.

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