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Policy Framework for Regulating Generative AI Prompts in Islamic Boarding School Curricula

Kerangka Kebijakan Regulasi Prompt Kecerdasan Buatan Generatif dalam Kurikulum Pesantren

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Abstract

Rapid generative artificial intelligence adoption in Indonesian Islamic boarding schools and madrasah outpaces formal curriculum governance, exposing classical texts to algorithmic hallucination and unverified hermeneutics. This study formulates an auditable policy framework regulating educator prompt engineering for Islamic religious education materials. Using a qualitative normative-jurisprudential desk design, national statutory instruments, international governance guidelines, and empirical benchmarking studies were analyzed through thematic content coding, regulatory gap comparison, and Maqashid Sharia synthesis. Findings demonstrate that unguided prompting fabricates narration chains, misclassifies hadith authenticity, flattens jurisprudential disagreement, and imposes high extraneous verification load on teachers, threatening scriptural preservation and critical intellect under Islamic law. Unlike prior studies examining general technology adoption or isolated model benchmarking, this research establishes prompt engineering as a regulable policy unit grounded in preventive jurisprudence. Implementing a two-tier governance architecture combining ministerial prompt-validation standards, scholar-audited repositories, and learning-analytics provenance trails with school-level peer review and epistemic literacy safeguards curricula.

Abstrak

Adopsi kecerdasan buatan generatif yang pesat di pesantren dan madrasah Indonesia melampaui tata kelola kurikulum formal, mengekspos teks klasik pada halusinasi algoritmik serta hermeneutika tanpa verifikasi. Penelitian ini merumuskan kerangka kebijakan teraudit yang meregulasi rekayasa prompt pendidik untuk materi pendidikan agama Islam. Menggunakan desain kepustakaan normatif-yurisprudensial kualitatif, instrumen perundang-undangan nasional, pedoman tata kelola internasional, dan studi pengujian empiris dianalisis melalui pengodean konten tematik, perbandingan kesenjangan regulasi, serta sintesis Maqashid Syariah. Temuan membuktikan bahwa penggunaan prompt tanpa panduan memalsukan sanad, menyalahklasifikasikan derajat hadis, mendangkalkan ikhtilaf fikih, dan meningkatkan beban verifikasi ekstrinsik guru, sehingga mengancam penjagaan agama serta akal dalam hukum Islam. Berbeda dari studi terdahulu mengenai adopsi teknologi umum atau pengujian model terpisah, riset ini menetapkan rekayasa prompt sebagai unit kebijakan teregulasi berbasis fikih preventif. Penerapan arsitektur tata kelola dua tingkat yang memadukan standar validasi kementerian, repositori teraudit ulama, dan jejak analitik pembelajaran dengan tinjauan sejawat serta literasi epistemik melindungi kurikulum.

A. INTRODUCTION

1. Backgound

Across global education systems and institutional learning analytics infrastructures, generative artificial intelligence (GenAI) has transitioned from experimental testing to routine instructional integration more rapidly than educational governance frameworks have been established. Data from the OECD Teaching and Learning International Survey indicate that 37 percent of surveyed teachers utilize generative AI for professional workflows, including lesson planning, instructional summarization, and assessment preparation, while contemporary learning analytics scholarship emphasizes that integrating generative models into educational ecosystems requires explicit human-centered governance, provenance tracking, and ethical safeguards.[1] Concurrently, a 2025 UNESCO global survey of higher education institutions hosting a UNESCO Chair or UNITWIN Network reported that approximately one-third of surveyed institutions still lacked formal regulatory guidance on AI utilization, corroborating systematic reviews in teacher education that document a persistent structural lag between classroom AI adoption and institutional policy specification—a governance deficit that is even more pronounced across primary, secondary, and religious education sectors.[2] Within this international landscape, Islamic religious education provides a critical empirical context for examining how unmonitored human-AI interaction affects canonically bounded curricula, with Indonesia's *pesantren* (Islamic boarding schools) and *madrasah* sector illustrating the operational risks of this regulatory gap.

Within Indonesian Islamic education, large language models (LLMs) such as ChatGPT and Gemini are increasingly utilized as instructional design aids. Educators in *pesantren* and *madrasah* employ prompt-based interactions to draft lesson plans, formulate classroom discussion questions, and paraphrase explanations of Qur'anic verses and prophetic traditions (*hadith*) for Islamic Religious Education (*Pendidikan*

[1] OECD, *OECD Digital Education Outlook 2026: Exploring Effective Uses of Generative AI in Education* (Paris: OECD Publishing, 2026), https://doi.org/10.1787/062a7394-en; Hassan Khosravi et al., "Generative AI and Learning Analytics: Pushing Boundaries, Preserving Principles," *Journal of Learning Analytics* 12, no. 1 (2025): 1–11, https://doi.org/10.18608/jla.2025.8961.

[2] UNESCO, "UNESCO Survey: Two-Thirds of Higher Education Institutions Have or Are Developing Guidance on AI Use," September 2, 2025, https://www.unesco.org/en/articles/unesco-survey-two-thirds-higher-education-institutions-have-or-are-developing-guidance-ai-use; Xiao Tan, Gary Cheng, and Man-Ho Ling, "Artificial Intelligence in Teaching and Teacher Professional Development: A Systematic Review," *Computers and Education: Artificial Intelligence* 8 (2025): 100355, https://doi.org/10.1016/j.caeai.2024.100355.

Agama Islam, PAI) courses.[3] Empirical studies across Indonesian Islamic educational institutions indicate that while educators actively use generative tools to construct contextual moral learning materials and ethical case simulations, institutional oversight relies predominantly on informal, ad hoc supervision rather than codified verification standards.[4] This classroom diffusion aligns with broader regional survey findings based on the Technology Acceptance Model (TAM), which demonstrate high perceived usefulness and behavioral acceptance of AI-assisted instruction among Muslim learners and educators despite the absence of standardized competencies for domain-specific prompt verification.[5] Consequently, the rate of instructional adoption has exceeded the regulatory capacity of Indonesia's religious education authorities to define the technical, pedagogical, and theological parameters of a valid instructional prompt.

The foundational analytical problem is that general-purpose generative AI models generate text through probabilistic token prediction across largely uncurated training corpora, rendering them structurally susceptible to algorithmic hallucination—the generation of syntactically fluent but unverified or fabricated propositions.[6] In the domain of Islamic jurisprudence and scriptural transmission, probabilistic fabrication constitutes a substantive epistemological and pedagogical risk. Empirical benchmarking of large language models across 10,000 items spanning Qur'anic studies, *hadith* sciences, and Islamic jurisprudence (*fiqh*), alongside comparative evaluations of ChatGPT in Qur'anic translation, demonstrates that model accuracy fluctuates between approximately 40 percent and over 90 percent depending on model architecture and task complexity, confirming that ungrounded generative systems cannot reliably reproduce scriptural or classical content without human verification.[7] Specifically, unguided models have been

[3] Ahmad Subhan Yazid, "Artificial Intelligence (AI) Adoption in Pesantren: Challenges and Readiness," in *Proceeding International Conference on Religion, Science and Education* 3 (2024): 855.
[4] M. Sukron Djazilan, Afib Rulyansah, and Jauharotur Rihlah, "Why AI Is Essential for the Future of Islamic Education: A Call for Ethical and Effective Implementation," *Edukasia: Jurnal Pendidikan dan Pembelajaran* 5, no. 2 (2024), https://doi.org/10.62775/edukasia.v5i2.1373; A. Achruh et al., "Challenges and Opportunities of Artificial Intelligence Adoption in Islamic Education in Indonesian Higher Education Institutions," *International Journal of Learning, Teaching and Educational Research* 23, no. 11 (2024): 423–443, https://doi.org/10.26803/ijlter.23.11.22.
[5] N. Faizin et al., "Muslim Students' Acceptance of Artificial Intelligence in Islamic Religious Education: An Extended TAM Approach," *Discover Education* 4, no. 1 (2025): 304, https://doi.org/10.1007/s44217-025-00767-1; Benjamin Luke Moorhouse, "Beginning and First-Year Language Teachers' Readiness for the Generative AI Age," *Computers and Education: Artificial Intelligence* 6 (2024): 100201, https://doi.org/10.1016/j.caeai.2024.100201.
[6] Muhammad Aurangzeb Ahmad, "Islamic Chatbots in the Age of Large Language Models" (arXiv preprint arXiv:2601.06092, 2025).
[7] Ali Abdelaal et al., "IslamicMMLU: A Benchmark for Evaluating LLMs on Islamic Knowledge" (arXiv preprint arXiv:2603.23750, 2026); Dzulfaidhi Hakimie Dzulraidi, Ali Abdul Jalil, and Muhammad Lukman

documented fabricating chains of transmission (*sanad*), misclassifying *hadith* authenticity gradations by conflating weak (*da'if*) narrations with authenticated (*sahih*) reports, and producing decontextualized summaries of classical Islamic scholarship (*turats*) that obscure multi-school jurisprudential disagreement (*ikhtilaf*).[8] When educators lacking formal training in prompt engineering and algorithmic auditing integrate these outputs directly into instructional handouts, unmonitored prompt construction introduces systematic content error and data bias into the *pesantren* curriculum.

Synthesizing the state of the art reveals three adjacent but disconnected streams of scholarship across the educational technology, computational linguistics, and Islamic ethics literature. The first stream encompasses systematic reviews in educational technology and learning analytics that examine GenAI adoption, teacher professional development, cognitive engagement, data privacy, and assessment integrity in general education settings, but do not address the strict source-fidelity and *isnad* verification requirements governing revealed and classical religious texts.[9] The second stream, situated within computational linguistics and Arabic natural language processing, evaluates hallucination rates in Islamic chatbots and tests architectural mitigations such as Retrieval-Augmented Generation (RAG) for automated *fatwa* and *turats* processing, yet focuses on backend algorithmic engineering rather than the institutional governance instruments needed by national education ministries to regulate educator prompting practices.[10] The third stream applies *Maqashid Sharia* (the higher objectives of Islamic law) to artificial intelligence ethics at a macro-philosophical level, articulating principles

Mat Sin, "The Accuracy of ChatGPT in Translating the Qur'an: A Comparative Analysis With Authoritative Translation," *QURANICA - International Journal of Quranic Research* 17, no. 2 (2025): 21–52, https://doi.org/10.22452/quranica.vol17no2.2.

[8] Muhammad Sajjad Akbar, "AI and Authenticity in Islamic Research: A Critical Evaluation of Generative AI Reliability, Hallucination, and Source Fidelity in Quranic, Hadith, and Fiqh Knowledge" (arXiv preprint arXiv:2607.28237, 2026).

[9] Shan Wang et al., "Artificial Intelligence in Education: A Systematic Literature Review," *Expert Systems with Applications* 252 (2024): 124167, https://doi.org/10.1016/j.eswa.2024.124167; Lixiang Yan et al., "Practical and Ethical Challenges of Large Language Models in Education: A Systematic Scoping Review," *British Journal of Educational Technology* 55, no. 1 (2024): 90–112, https://doi.org/10.1111/bjet.13370; Khosravi et al., "Generative AI and Learning Analytics," 1–11; Tan, Cheng, and Ling, "Artificial Intelligence in Teaching and Teacher Professional Development," 100355.

[10] Ahmad, "Islamic Chatbots"; Hamdy Mubarak et al., "IslamicEval 2025: The First Shared Task of Capturing LLMs Hallucination in Islamic Content," in *Proceedings of the Third Arabic Natural Language Processing Conference: Shared Tasks* (Suzhou: Association for Computational Linguistics, 2025), 480–493, https://doi.org/10.18653/v1/2025.arabicnlp-sharedtasks.67; Mohammed Amine Mouhoub, "Islamic Large Language Models: From Knowledge Acquisition to Trustworthy and Hallucination-Resistant AI" (arXiv preprint arXiv:2606.16629, 2026); Marryam Yahya Mohammed et al., "Aftina: Enhancing Stability and Preventing Hallucination in AI-Based Islamic Fatwa Generation Using LLMs and RAG," *Neural Computing and Applications* 37 (2025): 20957–20982, https://doi.org/10.1007/s00521-025-11229-y.

such as *hifz al-din* (safeguarding religion) and *hifz al-'aql* (safeguarding intellect) without operationalizing those norms into auditable curriculum-level prompt guidelines.[11] In contrast to previous studies that predominantly focused on general educational AI adoption, computational model benchmarking in isolation, or abstract Islamic bioethics without curriculum-level operationalization, this research offers a novel policy and learning-analytics governance approach by treating prompt engineering itself as the primary regulable unit of educational policy, integrating Indonesian religious education law with *Maqashid Sharia* jurisprudence to establish an auditable prompt-validation architecture.

The policy urgency of establishing this governance framework is underscored by Indonesia's recent regulatory developments. Through Decision of the Minister of Religious Affairs (KMA) Number 1503 of 2025, the Ministry of Religious Affairs (*Kementerian Agama*, Kemenag) revised national *madrasah* curriculum guidelines to introduce coding and artificial intelligence as elective subjects beginning in the 2025/2026 academic year, formally integrating AI into the *madrasah* instructional ecosystem without issuing corresponding quality-assurance protocols for AI-generated religious teaching materials.[12] Institutional readiness assessments further indicate that digital verification infrastructure, provenance audit trails, and codified ethical guidelines remain sparse across Indonesian *madrasah* and *pesantren*, widening the discrepancy between classroom technology deployment and regulatory oversight.[13] The central thesis defended in this study is that unregulated generative AI prompting exposes Islamic educational curricula to fabricated textual authority, flattened jurisprudential bias, and the erosion of scholarly (*kyai/ustaz*) gatekeeping, necessitating ex ante regulatory and learning-analytics auditing rather than post hoc error correction. For the international educational research and learning analytics community, regulating prompt-level human-AI interaction within a high-stakes, canonically bounded knowledge domain provides a transferable governance model for provenance tracking, human-in-the-loop content verification, and cognitive-load reduction across culturally diverse education systems. By

[11] Zainal Habib, "Ethics of Artificial Intelligence in Maqāṣid Al-Sharīʿa's Perspective," *KARSA: Journal of Social and Islamic Culture* 33, no. 1 (2025): 105–134, https://doi.org/10.19105/karsa.v33i1.19617.
[12] Kementerian Agama Republik Indonesia, *Keputusan Menteri Agama Nomor 1503 Tahun 2025 tentang Perubahan atas Keputusan Menteri Agama Nomor 450 Tahun 2024 tentang Pedoman Implementasi Kurikulum pada Raudhatul Athfal, Madrasah Ibtidaiyah, Madrasah Tsanawiyah, Madrasah Aliyah, dan Madrasah Aliyah Kejuruan* (Jakarta: Kementerian Agama RI, 2025).
[13] Yazid, "Artificial Intelligence (AI) Adoption in Pesantren," 855–860; Achruh et al., "Challenges and Opportunities of Artificial Intelligence Adoption in Islamic Education," 423–443.

synthesizing statutory analysis, cognitive load perspectives, and *Maqashid Sharia* jurisprudence (specifically the preventive maxim *sadd al-dhara'i*), this policy brief formulates a two-tier governance architecture that pairs macro-level Kemenag prompt-validation standards, scholar-audited RAG prompt repositories, and learning-analytics audit trails with micro-level *pesantren* peer review, teacher capacity-building, and student epistemic literacy.

2. Research Questions

Translating general-purpose generative artificial intelligence (GenAI) interactions into instructional materials for Islamic Religious Education (*Pendidikan Agama Islam*, PAI) introduces a critical governance problem at the intersection of human-AI interaction metrics, curriculum fidelity, and educational data ethics. In digital learning environments, user prompts function as the primary linguistic and cognitive steering mechanism governing probabilistic text generation; however, unstructured prompting by educators lacking domain-specific verification protocols frequently produces semantic confabulation, unverifiable citations, and extraneous cognitive verification load. Within Indonesian Islamic boarding schools (*pesantren*) and *madrasah*, treating generative outputs as authoritative pedagogical inputs without institutional auditing risks introducing fabricated chains of narration (*sanad*), misclassified prophetic traditions (*hadith*), and decontextualized summaries of classical scholarship (*turats*) into classroom instruction. While Decision of the Minister of Religious Affairs (KMA) Number 1503 of 2025 formally integrates artificial intelligence as an elective subject within the national *madrasah* curriculum, current regulatory instruments do not establish technical prompt-engineering standards, provenance audit trails, or theological validation protocols for AI-generated religious teaching materials.

To address this regulatory and epistemological gap, this study formulates and dissects three interrelated research questions that structure the subsequent analysis:

1. What specific epistemological, hermeneutical, and cognitive-load vulnerabilities arise when unguided generative AI prompting is utilized by educators to produce Islamic Religious Education materials in *pesantren* and *madrasah* learning environments?
2. How can Indonesian national education law and *Maqashid Sharia* jurisprudence—specifically the higher objectives of safeguarding religion (*hifz al-din*) and safeguarding intellect (*hifz al-'aql*), operationalized through the

preventive legal maxim *sadd al-dhara'i* (blocking the means to harm)—be synthesized to justify systemic ex ante auditing and validation of AI-generated religious instructional content?

3. What concrete macro-level regulatory instruments (issued by the Ministry of Religious Affairs) and micro-level institutional protocols (implemented within *pesantren* and *madrasah*) are required to operationalize an auditable prompt-governance regime while preserving the pedagogical utility of generative AI for religious educators?

3. Research Methods

a. Research Design and Approach

Situated within the educational policy analysis and learning-analytics governance domain, this study employs a qualitative, normative-jurisprudential desk research (*library research*) design integrating policy content analysis with Islamic legal reasoning. A non-empirical documentary design is methodologically justified because the primary object of inquiry is the structural adequacy of existing statutory instruments and the formulation of ex ante prompt-governance standards rather than the statistical measurement of post-deployment student behavioral logs. To construct an auditable governance model across technical, statutory, and theological dimensions, the research design synthesizes three analytical approaches:

1) **Statutory and Regulatory Approach:** Evaluates the hierarchy and substantive coverage of Indonesian national education legislation, ministerial curriculum decrees, and international AI-in-education governance guidelines to identify regulatory blind spots concerning teacher-generated AI instructional content.
2) **Conceptual and Learning-Analytics Governance Approach:** Draws on contemporary human-AI interaction frameworks, pedagogical prompt-engineering taxonomies, and Cognitive Load Theory to model how opaque probabilistic outputs generate extraneous verification burdens and provenance deficits in instructional design.
3) **Islamic Epistemological and Jurisprudential Approach:** Applies *Maqashid Sharia* legal theory—specifically *hifz al-din* and *hifz al-'aql*—alongside the *usul al-fiqh* preventive maxim *sadd al-dhara'i* to evaluate the normative permissibility of unguided prompting in scriptural

disciplines and establish the legal basis for preventive regulatory intervention.[14]

b. Data Sources and Corpus Characteristics

Because this policy study examines institutional governance architectures and textual reliability rather than human survey respondents, the research corpus consists of authoritative documentary, statutory, and empirical benchmarking sources categorized into four strata:

1) **Primary National Legal and Curriculum Instruments:** Comprises Law of the Republic of Indonesia Number 20 of 2003 on the National Education System and Decision of the Minister of Religious Affairs (KMA) Number 1503 of 2025 (amending KMA Number 450 of 2024 on curriculum implementation guidelines for *Raudhatul Athfal*, *Madrasah Ibtidaiyah*, *Madrasah Tsanawiyah*, *Madrasah Aliyah*, and *Madrasah Aliyah Kejuruan*).
2) **International Educational AI Governance Frameworks:** Encompasses global policy standards and institutional surveys issued by UNESCO (2023 guidance on generative AI in education and research; 2025 global institutional governance survey) and the OECD (*OECD Digital Education Outlook 2026*), alongside comparative cross-national studies of educational GenAI policies.
3) **Empirical Benchmarking and Technical Literature Corpus:** Includes peer-reviewed studies and technical benchmarks evaluating LLM accuracy, semantic entropy, and hallucination rates across Qur'anic translation, *hadith* grading, *fiqh* reasoning, and Retrieval-Augmented Generation (RAG) architectures (such as *IslamicMMLU*, *IslamicEval 2025*, and *Aftina*), paired with systematic reviews on educational prompt

[14] Cecilia Ka Yuk Chan, "A Comprehensive AI Policy Education Framework for University Teaching and Learning," *International Journal of Educational Technology in Higher Education* 20, no. 1 (2023): 38, https://doi.org/10.1186/s41239-023-00408-3; Irfan Ahmed Rind, "Conceptualizing the Impact of AI on Teacher Knowledge and Expertise: A Cognitive Load Perspective," *Education Sciences* 16, no. 1 (2026): 57, https://doi.org/10.3390/educsci16010057; Zainal Habib, "Ethics of Artificial Intelligence in Maqāṣid Al-Sharīʿa's Perspective," *KARSA: Journal of Social and Islamic Culture* 33, no. 1 (2025): 105–134, https://doi.org/10.19105/karsa.v33i1.19617; Ariyanti Mustapha, Zuraidah Kamaruddin, and Suhaizad Che Haron, "An Overview of Artificial Intelligence (AI) Issues From the Perspective of Islamic Jurisprudence," *Online Journal of Research in Islamic Studies* 12, no. 1 (2025): 95–114, https://doi.org/10.22452/ris.vol12no1.6; Jasser Auda, *Maqasid al-Shariah as Philosophy of Islamic Law: A Systems Approach* (London: International Institute of Islamic Thought, 2008), 21–26.

engineering and teacher cognitive load.

4) **Jurisprudential and Ethical Sources:** Consists of foundational and contemporary scholarship on *Maqashid Sharia* (following the classifications of al-Ghazali and al-Shatibi), resolutions of the International Islamic Fiqh Academy on *sadd al-dhara'i*, and peer-reviewed studies on Islamic digital ethics.[15]

c. Data Collection and Preprocessing Techniques

Documentary data collection was executed through systematic literature and statutory retrieval across legal repositories (JDIH Kementerian Agama), international policy archives (UNESCO and OECD digital libraries), and academic databases including Scopus, Web of Science, Association for Computational Linguistics (ACL) proceedings, and verified preprint archives. Source preprocessing and quality verification followed a three-step documentary auditing protocol:

1) **Statutory Authenticity and Currency Verification:** Legal and curriculum documents were cross-checked to confirm active regulatory status, specifically verifying the normative transition from KMA Number 450 of 2024 to KMA Number 1503 of 2025 regarding the introduction of elective artificial intelligence and coding subjects in the 2025/2026 academic year.

2) **Technical Evidence Filtering and Categorization:** Empirical studies on LLM performance in Islamic studies and general education were screened to separate peer-reviewed empirical evaluations (such as quantitative benchmarks of hallucination and RAG stability) from anecdotal commentary, organizing extracted metrics into a structured matrix of failure modes (*sanad* fabrication, *hadith* misgrading, *ikhtilaf*

[15] Republik Indonesia, *Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional* (Jakarta: Sekretariat Negara Republik Indonesia, 2003), 14–16; Kementerian Agama Republik Indonesia, *Keputusan Menteri Agama Nomor 1503 Tahun 2025 tentang Perubahan atas Keputusan Menteri Agama Nomor 450 Tahun 2024 tentang Pedoman Implementasi Kurikulum pada Raudhatul Athfal, Madrasah Ibtidaiyah, Madrasah Tsanawiyah, Madrasah Aliyah, dan Madrasah Aliyah Kejuruan* (Jakarta: Kementerian Agama RI, 2025), 8–12; Fengchun Miao and Wayne Holmes, *Guidance for Generative AI in Education and Research* (Paris: UNESCO, 2023), 18–24; OECD, *OECD Digital Education Outlook 2026: Exploring Effective Uses of Generative AI in Education* (Paris: OECD Publishing, 2026), 45–52, https://doi.org/10.1787/062a7394-en; Yueqiao Jin et al., "Generative AI in Higher Education: A Global Perspective of Institutional Adoption Policies and Guidelines," *Computers and Education: Artificial Intelligence* 8 (2025): 100348, https://doi.org/10.1016/j.caeai.2024.100348; Abu Ishaq al-Shatibi, *Al-Muwafaqat fi Usul al-Shari'ah*, ed. 'Abd Allah Darraz, vol. 2 (Beirut: Dar al-Ma'rifah, 1997), 8–14; International Islamic Fiqh Academy, "Sadd al-Dharai (Blocking the Means to Evil)," accessed 2026, https://iifa-aifi.org/en/32529.html.

flattening, and provenance opacity).

3) **Data Ethics and Integrity Compliance:** In accordance with research ethics standards, no human participants, personal student identifiers, or private learning management system (LMS) clickstream logs were collected or processed; methodological integrity and replicability were maintained through transparent source attribution, verbatim statutory cross-referencing, and explicit demarcation between empirical benchmark findings and normative policy prescriptions.[16]

d. Data Analysis Techniques

The curated documentary corpus was processed through a sequential, three-stage qualitative and normative analytical pipeline aligned with the formulated research questions:

1) **Thematic Content Analysis of Epistemological and Cognitive Risks:** Technical benchmarking studies and educational prompt-engineering reviews were analyzed using deductive thematic coding to isolate how probabilistic token prediction and ungrounded prompt structures interact with the verification standards of *'ulum al-hadith* and *turats* hermeneutics, while integrating Cognitive Load Theory to distinguish intrinsic pedagogical complexity from extraneous verification burden.

2) **Comparative Regulatory Gap Analysis:** Statutory provisions within Law Number 20 of 2003 and KMA Number 1503 of 2025 were systematically juxtaposed against UNESCO, OECD, and international educational AI governance models to identify structural omissions regarding teacher-facing prompt validation, content provenance logging, and institutional accountability.

3) **Normative Jurisprudential Synthesis (*Maqashid Sharia* Mapping):** Identified technical and regulatory vulnerabilities were evaluated against the protective thresholds of *hifz al-din* and *hifz al-'aql* using the

[16] Sharon Slade and Paul Prinsloo, "Learning Analytics: Ethical Issues and Dilemmas," *American Behavioral Scientist* 57, no. 10 (2013): 1510–1529, https://doi.org/10.1177/0002764213479366; Sebastian Farquhar et al., "Detecting Hallucinations in Large Language Models Using Semantic Entropy," *Nature* 630, no. 8017 (2024): 625–630, https://doi.org/10.1038/s41586-024-07421-0; Marryam Yahya Mohammed et al., "Aftina: Enhancing Stability and Preventing Hallucination in AI-Based Islamic Fatwa Generation Using LLMs and RAG," *Neural Computing and Applications* 37 (2025): 20957–20982, https://doi.org/10.1007/s00521-025-11229-y; Wisnu Uriawan et al., "Preventing AI Deepfake Abuse: An Islamic Ethics Framework" (arXiv preprint arXiv:2512.17218, 2025), 3–6.

preventive logic of *sadd al-dhara'i*, systematically mapping each diagnosed risk factor onto corresponding macro-level (Kemenag) and micro-level (*pesantren*) regulatory interventions to construct the two-tier policy framework presented in the discussion section.[17]

B. RESULTS AND DISCUSSION

1. Epistemological Vulnerabilities, Hermeneutical Flattening, and Cognitive-Load Risks in GenAI-Driven Pesantren Materials

Addressing the first research question, the primary epistemological vulnerability of generative artificial intelligence (GenAI) in Islamic Religious Education (*Pendidikan Agama Islam*, PAI) stems from the divergence between probabilistic text generation and canonical source transmission. Large language models (LLMs) construct responses by estimating conditional probability distributions over token sequences rather than retrieving verified propositions from authenticated textual repositories, a computational architecture that generates syntactically fluent assertions independent of factual or scriptural validity.[18] When educators in *pesantren* (Islamic boarding schools) and *madrasah* prompt general-purpose models without structural constraints to draft instructional content, semantic confabulation directly affects a curriculum domain where textual fidelity carries doctrinal weight. Empirical benchmarking across 10,000 multiple-choice items in *IslamicMMLU*—spanning Qur'anic studies, *hadith* sciences, and Islamic jurisprudence (*fiqh*)—demonstrates that model accuracy varies from below 40 percent to above 90 percent depending on model size and sub-discipline, while comparative evaluations of ChatGPT in Qur'anic translation document recurring semantic shifts and omission of exegetical context.[19] Similarly, mixed-method evaluations of six generative

[17] Daniel Lee and Edward Palmer, "Prompt Engineering in Higher Education: A Systematic Review to Help Inform Curricula," *International Journal of Educational Technology in Higher Education* 22, no. 1 (2025): 7, https://doi.org/10.1186/s41239-025-00503-7; Yoshija Walter, "Embracing the Future of Artificial Intelligence in the Classroom: The Relevance of AI Literacy, Prompt Engineering, and Critical Thinking in Modern Education," *International Journal of Educational Technology in Higher Education* 21, no. 1 (2024): 15, https://doi.org/10.1186/s41239-024-00448-3; Muslim Muslim, "Internalising Digital Technology in Islamic Education," *Scaffolding: Jurnal Pendidikan Islam dan Multikulturalisme* 6, no. 3 (2024): 45–58, https://doi.org/10.37680/scaffolding.v6i3.6309.

[18] Shan Wang et al., "Artificial Intelligence in Education: A Systematic Literature Review," *Expert Systems with Applications* 252 (2024): 124167, https://doi.org/10.1016/j.eswa.2024.124167; Sebastian Farquhar et al., "Detecting Hallucinations in Large Language Models Using Semantic Entropy," *Nature* 630, no. 8017 (2024): 625–630, https://doi.org/10.1038/s41586-024-07421-0.

[19] Ali Abdelaal et al., "IslamicMMLU: A Benchmark for Evaluating LLMs on Islamic Knowledge" (arXiv preprint arXiv:2603.23750, 2026), 4–9; Dzulfaidhi Hakimie Dzulraidi, Ali Abdul Jalil, and Muhammad Lukman Mat Sin, "The Accuracy of ChatGPT in Translating the Qur'an: A Comparative Analysis With

models across open-ended Qur'anic exegesis (*tafsir*), *hadith*, and *fiqh* prompts reveal persistent citation fabrication, inconsistent treatment of inter-school legal disagreement (*madhhab*), and ungrounded legal rulings.[20] In *pesantren* classrooms, where teachers routinely prompt models to explain prophetic traditions or formulate comprehension questions on Qur'anic verses, delegating content drafting to unverified probabilistic systems introduces systematic error into religious instruction.

A second vulnerability involves the fabrication of transmission chains (*sanad*) and the misclassification of authenticity gradations (*sahih*, *hasan*, *da'if*, and *mawdu'*) that govern the traditional Islamic science of *hadith* criticism (*'ulum al-hadith*). Because autoregressive language models optimize next-token plausibility rather than cross-referencing narrator biographies (*'ilm al-rijal*) or canonical *hadith* compendia (*al-kutub al-tis'ah*), ungrounded prompts frequently generate synthetic narrator sequences, misattribute reports to canonical collections, or conflate weak (*da'if*) narrations with authenticated (*sahih*) traditions.[21] Shared evaluation tasks in Arabic natural language processing—specifically *IslamicEval 2025*—have isolated Islamic hallucination detection as a distinct computational problem because standard fact-checking algorithms fail to verify granular *sanad-matn* (chain-and-text) integrity.[22] When a *pesantren* or *madrasah* educator operating under instructional time constraints incorporates an unverified AI-generated *hadith* citation into a classroom handout, the institution inadvertently lends pedagogical authority to fabricated scriptural evidence.

A third vulnerability concerns the hermeneutical flattening of classical Islamic scholarship (*turats*). Classical *kitab kuning* texts across *tafsir*, *fiqh*, and theology (*kalam*) rely on multi-layered legal reasoning (*istinbat*), explicit documentation of juristic disagreement (*ikhtilaf*), and contextual qualification across the four Sunni schools of jurisprudence. Single-turn user prompts asking an LLM to summarize a classical ruling

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Authoritative Translation," *QURANICA - International Journal of Quranic Research* 17, no. 2 (2025): 21–52, https://doi.org/10.22452/quranica.vol17no2.2.

[20] Muhammad Sajjad Akbar, "AI and Authenticity in Islamic Research: A Critical Evaluation of Generative AI Reliability, Hallucination, and Source Fidelity in Quranic, Hadith, and Fiqh Knowledge" (arXiv preprint arXiv:2607.28237, 2026), 6–14.

[21] Mohammed Amine Mouhoub, "Islamic Large Language Models: From Knowledge Acquisition to Trustworthy and Hallucination-Resistant AI" (arXiv preprint arXiv:2606.16629, 2026), 3–8; Muhammad Aurangzeb Ahmad, "Islamic Chatbots in the Age of Large Language Models" (arXiv preprint arXiv:2601.06092, 2025), 5–11.

[22] Hamdy Mubarak et al., "IslamicEval 2025: The First Shared Task of Capturing LLMs Hallucination in Islamic Content," in *Proceedings of the Third Arabic Natural Language Processing Conference: Shared Tasks* (Suzhou: Association for Computational Linguistics, 2025), 480–493, https://doi.org/10.18653/v1/2025.arabicnlp-sharedtasks.67.

routinely compress pluralistic legal discourse into a single, decontextualized assertion, erasing the methodological pluralism central to *pesantren* epistemology.[23] This reductionism is compounded by provenance opacity: because standard conversational interfaces omit inline source metadata unless constrained by structured prompt templates or Retrieval-Augmented Generation (RAG) pipelines, neither teachers nor students can readily distinguish an authenticated classical ruling from an algorithmic approximation.

These algorithmic failure modes are magnified by institutional gaps in teacher verification capacity and learning-analytics governance. Empirical research on generative AI integration indicates that educators rarely possess formal training in domain-specific prompt engineering, intelligent Technological Pedagogical Content Knowledge (i-TPACK), or output auditing techniques such as semantic cross-checking against RAG-grounded repositories.[24] Furthermore, *pesantren* and *madrasah* systems currently lack learning-analytics audit trails that log which AI-generated lesson materials enter the curriculum, what prompt syntax generated them, and which subject-matter specialist verified their accuracy. Foundational and contemporary learning-analytics scholarship demonstrates that deploying educational technologies without transparent provenance logging, human-in-the-loop checkpoints, and clear accountability protocols institutionalizes unmonitored pedagogical risk.[25]

Evaluating these vulnerabilities through Cognitive Load Theory (CLT) and Self-Regulated Learning (SRL) frameworks clarifies why unguided GenAI use degrades instructional quality and learner autonomy. Cognitive Load Theory differentiates intrinsic load (the inherent conceptual complexity of an instructional domain, such as *usul al-fiqh* or *'ulum al-hadith*) from extraneous load (unproductive mental effort imposed by flawed instructional design or opaque system interfaces) and germane load (effortful cognitive

[23] Ahmad, "Islamic Chatbots," 7–10; Akbar, "AI and Authenticity in Islamic Research," 11–15.
[24] Marryam Yahya Mohammed et al., "Aftina: Enhancing Stability and Preventing Hallucination in AI-Based Islamic Fatwa Generation Using LLMs and RAG," *Neural Computing and Applications* 37 (2025): 20957–20982, https://doi.org/10.1007/s00521-025-11229-y; Ahlam Mohammed Al-Abdullatif, "Modeling Teachers' Acceptance of Generative Artificial Intelligence Use in Higher Education: The Role of AI Literacy and Intelligent TPACK," *Education and Information Technologies* 29, no. 11 (2024): 14223–14248, https://doi.org/10.1007/s10639-024-12782-0; Daniel Lee and Edward Palmer, "Prompt Engineering in Higher Education: A Systematic Review to Help Inform Curricula," *International Journal of Educational Technology in Higher Education* 22, no. 1 (2025): 7, https://doi.org/10.1186/s41239-025-00503-7.
[25] Sharon Slade and Paul Prinsloo, "Learning Analytics: Ethical Issues and Dilemmas," *American Behavioral Scientist* 57, no. 10 (2013): 1510–1529, https://doi.org/10.1177/0002764213479366; Hassan Khosravi et al., "Generative AI and Learning Analytics: Pushing Boundaries, Preserving Principles," *Journal of Learning Analytics* 12, no. 1 (2025): 1–11, https://doi.org/10.18608/jla.2025.8961.

schema construction). Applied to educators, recent cognitive-load analyses demonstrate that opaque AI interfaces shift the teacher's role from pedagogical orchestration to unassisted error detection, imposing high extraneous and ethical-cognitive verification load when teachers must manually trace unreferenced machine claims back to print *turats* volumes.[26] Simultaneously, from a Self-Regulated Learning perspective, recent experimental and human-AI collaboration studies establish that while scaffolded GenAI environments can support metacognitive monitoring, unguided reliance on fluent AI outputs induces cognitive offloading and metacognitive passivity among learners, weakening their capacity for critical source evaluation.[27] Consequently, the absence of institutional prompt standards and provenance trails represents both a governance deficit and a cognitive-architecture flaw: establishing structured prompt templates and peer-review verification transfers extraneous verification load away from individual teachers while scaffolding students' self-regulated epistemic vigilance.

2. Theological and Regulatory Governance under Educational Law and Islamic Jurisprudence

Addressing the second research question, the necessity for preventive prompt regulation is grounded in the intersection of Indonesian national education law and *Maqashid Sharia* jurisprudence. Under Law of the Republic of Indonesia Number 20 of 2003 on the National Education System, the state—and by statutory delegation the Ministry of Religious Affairs (*Kementerian Agama*, Kemenag) for Islamic educational institutions—is mandated to ensure that national curricula maintain educational quality while upholding religious values and national character.[28] Kemenag exercised this regulatory authority through Decision of the Minister of Religious Affairs (KMA) Number 1503 of 2025 (amending KMA Number 450 of 2024), which revises *madrasah* curriculum

[26] Irfan Ahmed Rind, "Conceptualizing the Impact of AI on Teacher Knowledge and Expertise: A Cognitive Load Perspective," *Education Sciences* 16, no. 1 (2026): 57, https://doi.org/10.3390/educsci16010057; John Sweller, Paul Ayres, and Slava Kalyuga, *Cognitive Load Theory* (New York: Springer, 2011), 57–68, https://doi.org/10.1007/978-1-4419-8126-4.
[27] Ruiqi Deng et al., "Does ChatGPT Enhance Student Learning? A Systematic Review and Meta-Analysis of Experimental Studies," *Computers & Education* 227 (2025): 105224, https://doi.org/10.1016/j.compedu.2025.105224; Xiaoshu Xu et al., "Enhancing Self-Regulated Learning and Learning Experience in Generative AI Environments: The Critical Role of Metacognitive Support," *British Journal of Educational Technology* 56, no. 5 (2025): 1842–1863, https://doi.org/10.1111/bjet.13599; Abram D. Anders and Emily Dux Speltz, "Developing Generative AI Literacies Through Self-Regulated Learning: A Human-Centered Approach," *Computers and Education: Artificial Intelligence* 9 (2025): 100482, https://doi.org/10.1016/j.caeai.2025.100482.
[28] Republik Indonesia, *Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional* (Jakarta: Sekretariat Negara Republik Indonesia, 2003), 14–16.

implementation guidelines and introduces coding and artificial intelligence as elective subjects beginning in the 2025/2026 academic year.[29] However, KMA Number 1503 of 2025 regulates AI strictly as a curricular subject rather than governing AI as an instructional content-generation tool; it contains no technical standards for prompt construction, source verification, or institutional auditing of AI-drafted PAI materials. Within Indonesian administrative law and comparative global AI-policy frameworks, the absence of explicit ministerial rules on teacher prompting does not absolve educational authorities of their statutory duty of care: the legal mandate to safeguard religious curriculum integrity entails an affirmative obligation to mitigate foreseeable algorithmic distortion.[30]

Maqashid Sharia—the higher normative objectives of Islamic law systematized by classical jurists including al-Ghazali and al-Shatibi and expanded in contemporary systems-based legal philosophy—provides the jurisprudential framework to fill this regulatory lacuna.[31] Classical *Maqashid* theory structures legal protection around five foundational necessities (*al-daruriyyat al-khams*): safeguarding religion (*hifz al-din*), life (*hifz al-nafs*), intellect (*hifz al-'aql*), lineage (*hifz al-nasl*), and property (*hifz al-mal*). In contemporary Islamic jurisprudence on artificial intelligence, *hifz al-din* obligates educational institutions to preserve the authenticity of scriptural transmission (*riwayah*) and legal interpretation (*dirayah*) against fabrication, whereas *hifz al-'aql* mandates the protection of human cognitive faculties against systematic misinformation, epistemic deskilling, and uncritical algorithmic dependency.[32] Within the *pesantren* and *madrasah*

[29] Kementerian Agama Republik Indonesia, *Keputusan Menteri Agama Nomor 1503 Tahun 2025 tentang Perubahan atas Keputusan Menteri Agama Nomor 450 Tahun 2024 tentang Pedoman Implementasi Kurikulum pada Raudhatul Athfal, Madrasah Ibtidaiyah, Madrasah Tsanawiyah, Madrasah Aliyah, dan Madrasah Aliyah Kejuruan* (Jakarta: Kementerian Agama RI, 2025), 8–12.
[30] Yueqiao Jin et al., "Generative AI in Higher Education: A Global Perspective of Institutional Adoption Policies and Guidelines," *Computers and Education: Artificial Intelligence* 8 (2025): 100348, https://doi.org/10.1016/j.caeai.2024.100348; Cecilia Ka Yuk Chan, "A Comprehensive AI Policy Education Framework for University Teaching and Learning," *International Journal of Educational Technology in Higher Education* 20, no. 1 (2023): 38, https://doi.org/10.1186/s41239-023-00408-3.
[31] Abu Hamid al-Ghazali, *Al-Mustasfa min 'Ilm al-Usul*, ed. Muhammad 'Abd al-Salam 'Abd al-Shafi, vol. 1 (Beirut: Dar al-Kutub al-'Ilmiyyah, 1993), 174–175; Abu Ishaq al-Shatibi, *Al-Muwafaqat fi Usul al-Shari'ah*, ed. 'Abd Allah Darraz, vol. 2 (Beirut: Dar al-Ma'rifah, 1997), 8–14; Jasser Auda, *Maqasid al-Shariah as Philosophy of Islamic Law: A Systems Approach* (London: International Institute of Islamic Thought, 2008), 21–26; Zainal Habib, "Ethics of Artificial Intelligence in Maqāṣid Al-Sharīʿa's Perspective," *KARSA: Journal of Social and Islamic Culture* 33, no. 1 (2025): 105–134, https://doi.org/10.19105/karsa.v33i1.19617.
[32] Habib, "Ethics of Artificial Intelligence in Maqāṣid Al-Sharīʿa's Perspective," 112–125; Ariyanti Mustapha, Zuraidah Kamaruddin, and Suhaizad Che Haron, "An Overview of Artificial Intelligence (AI) Issues From the Perspective of Islamic Jurisprudence," *Online Journal of Research in Islamic Studies* 12, no. 1 (2025): 95–114, https://doi.org/10.22452/ris.vol12no1.6.

curriculum, *hifz al-din* is compromised whenever unguided prompt engineering introduces fabricated *sanad* or distorted *fiqh* rulings into instructional materials, while *hifz al-'aql* is undermined when probabilistic fluency displaces the critical, source-grounded analytical habits (*tahqiq* and *tabayyun*) required of educators and students. Empirical studies on digital technology integration in Indonesian Islamic education confirm that unmanaged AI adoption erodes religious literacy and fosters passive technological dependency unless bounded by explicit institutional governance.[33]

To translate *hifz al-din* and *hifz al-'aql* into an enforceable regulatory posture, the *usul al-fiqh* legal maxim *sadd al-dhara'i* (blocking the means to harm) supplies the operative normative mechanism. In Islamic legal theory, when an intrinsically permissible instrument (*wasilah mubahah*) carries a high statistical or structural probability of producing a prohibited harm (*mafsadah*), juristic reasoning mandates restricting or regulating the instrument ex ante rather than waiting for doctrinal harm to materialize.[34] Unregulated prompt engineering in PAI curriculum design satisfies the criteria for *sadd al-dhara'i*: although utilizing generative AI for lesson preparation is permissible in principle, the empirically documented rates of *hadith* fabrication, *sanad* confabulation, and hermeneutical flattening constitute a predictable pathway toward corrupting religious instruction. Accordingly, *sadd al-dhara'i* legally and theologically justifies mandatory ex ante prompt standardization and human-in-the-loop auditing prior to classroom distribution. Elevating this local jurisprudential reasoning to international educational discourse demonstrates strong convergence with UNESCO's precautionary governance framework and global learning-analytics principles, which similarly mandate pre-deployment validation, algorithmic transparency, and institutional accountability when integrating generative models into high-stakes educational settings.[35]

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[33] Muslim Muslim, "Internalising Digital Technology in Islamic Education," *Scaffolding: Jurnal Pendidikan Islam dan Multikulturalisme* 6, no. 3 (2024): 45–58, https://doi.org/10.37680/scaffolding.v6i3.6309; A. Achruh et al., "Challenges and Opportunities of Artificial Intelligence Adoption in Islamic Education in Indonesian Higher Education Institutions," *International Journal of Learning, Teaching and Educational Research* 23, no. 11 (2024): 423–443, https://doi.org/10.26803/ijlter.23.11.22.

[34] International Islamic Fiqh Academy, "Sadd al-Dharai (Blocking the Means to Evil)," accessed 2026, https://iifa-aifi.org/en/32529.html; Wisnu Uriawan et al., "Preventing AI Deepfake Abuse: An Islamic Ethics Framework" (arXiv preprint arXiv:2512.17218v2, 2025), 3–6; Al-Shatibi, *Al-Muwafaqat fi Usul al-Shari'ah*, vol. 4, 198–204.

[35] Fengchun Miao and Wayne Holmes, *Guidance for Generative AI in Education and Research* (Paris: UNESCO, 2023), 18–24; OECD, *OECD Digital Education Outlook 2026: Exploring Effective Uses of Generative AI in Education* (Paris: OECD Publishing, 2026), 45–52, https://doi.org/10.1787/062a7394-en.

Table 1 synthesizes the epistemological and cognitive vulnerabilities diagnosed in Section B.1, maps each vulnerability onto its corresponding *Maqashid Sharia* and learning-theory foundation, and specifies the preventive regulatory intervention justified under *sadd al-dhara'i*.

Table 1. Policy Vulnerabilities, Maqashid Sharia Foundations, and Regulatory Interventions for GenAI Prompts in Pesantren

Policy and Epistemological Vulnerability	Maqashid Sharia and Cognitive/SRL Foundation	Preventive Regulatory Intervention (*Sadd al-Dhara'i*)
Hallucinated *sanad* (chain of narration) and *hadith* authenticity misgrading	*Hifz al-Din* (safeguarding scriptural transmission integrity)	Mandatory source-verification protocol cross-checking outputs against canonical *hadith* compilations (*al-kutub al-tis'ah*) before classroom use
Superficial or flattened extraction of *turats* and multi-madhhab disagreement (*ikhtilaf*)	*Hifz al-'Aql* (preserving critical pluralistic reasoning and germane cognitive load)	Scholar (*kyai/ustaz*)-vetted prompt templates requiring explicit multi-*madhhab* attribution and classical text provenance
Absence of standardized Kemenag prompt-engineering guidelines under KMA No. 1503 of 2025	*Hifz al-Din*; public welfare (*maslahah 'ammah*); institutional data governance	Issuance of a national Kemenag technical circular establishing prompt-validation standards for PAI instructional design
Untracked AI-assisted instructional materials and high teacher extraneous verification load	*Hifz al-'Aql*; Cognitive Load Theory (reducing extraneous verification burden)	Institutional learning-analytics audit trail logging prompt syntax, RAG source metadata, and reviewing scholar sign-off
Educator and student vulnerability to cognitive offloading and uncritical AI acceptance	*Hifz al-'Aql*; Self-Regulated Learning (scaffolding metacognitive monitoring)	Regional Kemenag i-TPACK prompt-auditing workshops for teachers and *isnad*-based epistemic literacy modules for students

Source: author's synthesis of the analysis in Sections B.1 and B.2.

3. Prescriptive Policy Brief Framework for Generative AI Engineering in Islamic Curricula

Addressing the third research question, this study formulates a two-tier governance architecture that synchronizes macro-level regulatory instruments issued by the Ministry of Religious Affairs with micro-level institutional workflows within *pesantren* and *madrasah*. At the macro level, the framework specifies three ministerial interventions:

a. National Technical Standards for Religious Prompt Engineering: Kemenag should issue a binding technical circular supplementing KMA Number 1503 of 2025 that governs AI-assisted instructional content creation.[36] Drawing on recent pedagogical prompt-engineering taxonomies, this standard must mandate structured prompt components—specifically role

[36] Kementerian Agama Republik Indonesia, *Keputusan Menteri Agama Nomor 1503 Tahun 2025*, 8–12; Lee and Palmer, "Prompt Engineering in Higher Education," 7.

specification, canonical source restriction, explicit instruction to display inter-*madhhab* disagreement (*ikhtilaf*), and automated flagging of all Qur'anic and *hadith* citations for human verification prior to classroom deployment.

b. **Scholar-Audited Retrieval-Augmented Generation (RAG) Prompt Repository:** In collaboration with State Islamic Universities (UIN) and *pesantren* scholarly councils (*Ma'had Aly*), Kemenag should develop an open-access, RAG-grounded repository of vetted prompt templates anchored to verified digital *turats* corpora. Grounding educator prompts in curated scriptural databases substantially reduces semantic entropy and lowers teachers' extraneous verification load while retaining the instructional efficiency of generative tools.

c. **Provincial and National Learning-Analytics Provenance Auditing:** Kemenag's Directorate General of Islamic Education should integrate a standardized metadata logging protocol into existing digital madrasah platforms, recording the specific LLM version, prompt text, source citations, and human verifier identity for all AI-assisted digital textbooks and modules.[37] In international learning-analytics terms, this provenance registry shifts governance from post hoc complaint handling to continuous, auditable quality assurance applicable to any canonically bounded curriculum worldwide.

At the micro level, the governance architecture translates ministerial standards into three operational mechanisms adapted to the institutional structure of *pesantren* and *madrasah*:

a. **Tiered Scholarly (*Kyai/Ustaz*) Peer-Review Gatekeeping:** Individual *pesantren* and *madrasah* should institute a mandatory pre-classroom verification workflow wherein any AI-assisted lesson plan, *hadith* handout, or *fiqh* case simulation drafted by a teacher is cross-checked by a senior *ustaz*, *kyai*, or curriculum coordinator against authoritative print or verified digital compendia. This human-in-the-loop protocol embeds traditional Islamic *tashih* (textual authentication) directly into school-level learning analytics, redistributing extraneous verification load from isolated teachers to a

[37] Slade and Prinsloo, "Learning Analytics: Ethical Issues and Dilemmas," 1518–1524; Khosravi et al., "Generative AI and Learning Analytics," 4–8.

structured institutional review process.[38]

b. **Competency-Based Educator Training in Ethical Prompting and Hallucination Auditing:** Utilizing Kemenag's regional training centers (*Balai Diklat Keagamaan*) and teacher working groups (*Musyawarah Guru Mata Pelajaran*, MGMP PAI), professional development programs should train educators in applied prompt engineering, i-TPACK integration, and hallucination diagnostics—including how to identify fabricated *sanad* chains, non-existent page citations, and decontextualized legal rulings.

c. **Student Self-Regulated Epistemic Literacy Modules:** Curricular implementation of elective AI courses under KMA Number 1503 of 2025 should incorporate structured Self-Regulated Learning modules that train *santri* and *madrasah* students in metacognitive source monitoring. Rather than focusing solely on technical coding or prompt syntax, instruction should cultivate epistemic caution—requiring learners to verify unattributed algorithmic claims through traditional *isnad* and *tabayyun* (critical verification) principles, thereby preventing cognitive offloading and strengthening self-regulated critical thinking.[39]

C. CONCLUSIONS

Unguided generative artificial intelligence prompting in *pesantren* and *madrasah* instructional design introduces severe epistemological and cognitive vulnerabilities, including fabricated chains of narration (*sanad*), misclassified *hadith* gradations, hermeneutical flattening of classical juristic disagreement (*ikhtilaf*), and elevated extraneous verification load for educators. Synthesizing Indonesia's statutory mandate under Law Number 20 of 2003 and Decision of the Minister of Religious Affairs Number 1503 of 2025 with *Maqashid Sharia* jurisprudence demonstrates that safeguarding religion (*hifz al-din*) and intellect (*hifz al-'aql*) through the preventive maxim *sadd al-*

[38] Ahmad, "Islamic Chatbots," 9–11; Mohammed et al., "Aftina: Enhancing Stability and Preventing Hallucination," 20962–20975; Rind, "Conceptualizing the Impact of AI on Teacher Knowledge and Expertise," 57.
[39] Thomas K. F. Chiu, "A Classification Tool to Foster Self-Regulated Learning With Generative Artificial Intelligence by Applying Self-Determination Theory: A Case of ChatGPT," *Educational Technology Research and Development* 72, no. 4 (2024): 2401–2416, https://doi.org/10.1007/s11423-024-10366-w; Anders and Dux Speltz, "Developing Generative AI Literacies Through Self-Regulated Learning," 100482; Yoshija Walter, "Embracing the Future of Artificial Intelligence in the Classroom: The Relevance of AI Literacy, Prompt Engineering, and Critical Thinking in Modern Education," *International Journal of Educational Technology in Higher Education* 21, no. 1 (2024): 15, https://doi.org/10.1186/s41239-024-00448-3.

dhara'i legally and theologically mandates ex ante prompt validation rather than reactive error correction. Operationalizing this preventive posture requires a two-tier governance architecture that pairs macro-level Ministry of Religious Affairs prompt-engineering standards, scholar-audited Retrieval-Augmented Generation repositories, and learning-analytics provenance trails with micro-level *kyai* or *ustaz* peer review, educator capacity-building, and student self-regulated epistemic literacy. Treating prompt engineering as an auditable unit of educational policy enables religious and canonically bounded education systems worldwide to harness generative technologies while preserving textual authenticity and critical human agency.

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CRediT authorship contribution statement. H.I.: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing – original draft, Writing – review & editing.

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Ethics statement. Institutional ethical clearance was not required for this study because it employed a normative-jurisprudential and documentary desk-research design utilizing publicly available legal instruments and secondary academic literature without involving human participants or sensitive personal student records.

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