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A RETRIEVAL-AUGMENTED GENERATION (RAG)–BASED ISLAMIC EDUCATION DEVELOPMENT MODEL TO ENHANCE STUDENTS' RELIGIOUS LITERACY

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Abstract

This study examines the development and implementation of a Retrieval-Augmented Generation (RAG) model grounded in a needs-based design framework within Islamic higher education. The research aims to analyze how the integration of retrieval and generation components transforms Islamic learning from a transmissive paradigm toward a constructive-digital epistemology that is reflective and contextual. Employing a qualitative field-based approach, the study explores pedagogical dynamics, institutional culture, and epistemic governance in the adoption of AI-assisted learning. The findings indicate that the RAG model enhances source literacy and digital religious literacy by enabling students to systematically access authoritative references, verify information, compare scholarly perspectives, and construct contextually grounded arguments. Furthermore, the model strengthens scientific integrity through curated knowledge governance aligned with authoritative Islamic sources. Pedagogically, the implementation fosters higher-order thinking and repositions lecturers as reflective facilitators and epistemic curators rather than sole transmitters of knowledge. Despite challenges related to algorithmic bias, technological skepticism, and institutional readiness, adaptive strategies—including digital-normative literacy training, structured source curation, and AI ethics integration—demonstrate the model's potential to reinforce advanced religious literacy while preserving epistemological integrity. The study contributes to the emerging discourse on AI-assisted Islamic pedagogy by proposing an integrative framework that harmonizes generative AI technologies with the normative foundations of Islamic intellectual tradition.

A. Introduction

The development of information technology and Artificial Intelligence (AI) has brought significant transformation across various educational sectors, including Islamic education. University students, as agents of learning in higher education, face substantial challenges in accessing, understanding, and internalizing extensive and complex religious literature. Recent studies indicate that students' religious literacy remains largely limited to conventional content mastery and memorization, resulting in suboptimal critical analysis of Islamic texts.[1] This phenomenon is important because deep religious literacy serves as a foundation for character development, critical thinking, and the integration of Islamic values into students' lives.[2] One technological innovation emerging in technology-based education is Retrieval-Augmented Generation (RAG), an AI approach that combines information

[1] A Ahmad dan M Rahman, "Religious literacy among university students: Challenges in Islamic higher education," *Journal of Islamic Education Studies* 10, no. 2 (2022): 145–60.

[2] A Sulaiman, "Islamic pedagogy and religious literacy development in higher education," *Journal of Muslim Education Review* 5, no. 1 (2020): 23–38.

retrieval and content generation to produce relevant, contextual, and accurate text.[3] This approach offers unique potential for Islamic education by enabling students to access classical and contemporary sources in a structured manner while developing critical analysis grounded in reliable references. The integration of RAG in Islamic education remains limited, creating opportunities to enrich teaching methods, enhance religious literacy, and optimize technology-based learning processes.[4] Furthermore, the integration of RAG into Islamic education not only improves the efficiency of information access but also fosters students' reflective and analytical skills. Through its ability to provide source-based answers while recommending additional literature, RAG enables students to develop deeper understanding of the Qur'an, hadith, fiqh, and other religious works, making their religious literacy more holistic and contextual.[5] This highlights the urgency of designing an RAG-based Islamic education development model that combines technological capabilities with Islamic learning traditions to produce students who are religiously literate and capable of navigating digital-era challenges.

Students in Islamic higher education still experience significant limitations in religious literacy, often relying on memorization or textual understanding without critical engagement with classical and contemporary Islamic sources.[6] This condition restricts their ability to understand historical, social, and applied contexts of Islamic teachings and is exacerbated by the proliferation of unverified digital information, exposing students to information overload without adequate evaluative skills.

Moreover, technology integration in Islamic education remains minimal. Although AI-based systems such as Retrieval-Augmented Generation (RAG) have been widely applied in general education, their implementation in Islamic education is still scarce.[7] Traditional teaching methods emphasizing lectures, conventional discussion, or memorization often fail to provide fast, relevant, and contextual information access. This gap demonstrates the urgent need for pedagogical innovation aligned with Islamic values and digital-era demands.

The phenomenon above reveals a gap between students' needs and existing learning approaches. Students require learning models that simultaneously enhance religious literacy and critical, reflective, and analytical thinking skills.[8] Retrieval-Augmented Generation presents unique potential to address this need by enabling accurate and critically analyzable knowledge acquisition, yet the model remains rarely integrated into Islamic education curricula.[9]

Previous studies on students' religious literacy largely emphasize traditional approaches focusing on content mastery without strengthening reflective analysis.[10] Other research highlights technology integration in general education, including AI-based information learning, yet few apply it specifically within Islamic education.[11] Consequently, a

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[3] P Lewis et al., "Retrieval-augmented generation for knowledge-intensive NLP tasks," *Advances in Neural Information Processing Systems* 33 (2020): 9459–74.

[4] Y Bai, R Jones, dan L Wang, "Generative AI in education: Opportunities and pedagogical implications," *Computers & Education: Artificial Intelligence* 4 (2023): 100118.

[5] T B Brown et al., "Language models are few-shot learners," *Advances in Neural Information Processing Systems* 33 (2020): 1877–1901.

[6] Ahmad dan Rahman, "Religious literacy among university students: Challenges in Islamic higher education."

[7] Lewis et al., "Retrieval-augmented generation for knowledge-intensive NLP tasks."

[8] Brown et al., "Language models are few-shot learners."

[9] Bai, Jones, dan Wang, "Generative AI in education: Opportunities and pedagogical implications."

[10] Ahmad dan Rahman, "Religious literacy among university students: Challenges in Islamic higher education."

[11] Lewis et al., "Retrieval-augmented generation for knowledge-intensive NLP tasks."

significant gap persists between technological potential and Islamic learning practices in higher education.

The novelty of this study lies in developing an RAG-based Islamic pedagogical model not identified in previous research. By integrating retrieval and generative AI, the model enables students to synthesize diverse Islamic literature sources—including the Qur'an, hadith, classical turath literature, and contemporary scholarship—in a structured and contextual manner.[12] The innovation of this research lies in establishing an intelligent technology-based Islamic education framework aligned with Islamic values, thereby enhancing students' religious literacy in response to digital-era challenges.

This study aims to describe and analyze the design and development of an Islamic education model based on Retrieval-Augmented Generation (RAG) to enhance university students' religious literacy. The study emphasizes integrating authoritative Islamic sources into a technology-based pedagogical framework while exploring students' and lecturers' experiences, identifying implementation challenges, and formulating adaptive strategies to ensure alignment with Islamic epistemological and normative values in the era of digital transformation.

B. Methods

This study employed a qualitative approach with an exploratory case study design to gain an in-depth understanding of the design, implementation, and evaluation processes of a Retrieval-Augmented Generation (RAG)–based Islamic education model aimed at enhancing university students' religious literacy. A case study design was selected because it enables contextual and comprehensive exploration of phenomena within real-life learning settings.[13] The research site was determined purposively within Islamic Education programs or institutions that had integrated AI technologies into instructional practices. Research participants were selected through purposive sampling, involving course lecturers, students participating in RAG-based learning, and digital learning system administrators, as recommended in qualitative research to achieve depth of data.[14] Data were collected through semi-structured interviews, participant observation, and document analysis to capture the dynamics of model implementation and participants' experiences holistically.

Data analysis was conducted using thematic analysis, encompassing stages of data condensation, data display, coding, theme identification, and reflective conclusion drawing.[15] Data condensation involved selecting, focusing, and simplifying raw data without eliminating its substantive meaning. Trustworthiness was ensured through source and method triangulation, member checking, and an audit trail to establish credibility, dependability, and confirmability of the findings.[16] The results of the analysis were subsequently used to formulate a contextual and adaptive conceptual model for RAG-based Islamic education development aligned with Islamic epistemological values in the era of digital transformation.

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[12] Brown et al., "Language models are few-shot learners."

[13] Robert K. Yin, "Robert K. Yin Case Study Research Design and Methods, Third Edition, Applied Social Research Methods Series, Vol 5 2002.pdf," 2003.

[14] John W Creswell dan Cheryl N Poth, *Qualitative inquiry and research design: Choosing among five approaches*, 4th ed. (Sage Publications, 2018).

[15] M. B. Miles, A. M. Huberman, dan J. Saldana, *Qualitative Data Analysis: A Methods Sourcebook (3rd ed.)* (California: Sage Publications, 2014).

[16] Yvonna S Lincoln dan Egon G Guba, *Naturalistic inquiry* (Sage Publications, 1985).

C. Results and Discussion

Development of an RAG-Based Islamic Education Model to Enhance Students' Religious Literacy

Findings related to the use of a needs-based design indicate that the development of the RAG model is not technocentric but originates from students' epistemic challenges in understanding religious texts. Students' tendency to interpret scriptural evidence in a fragmented manner reveals a gap between textual literacy and contextual literacy. From the perspective of Islamic pedagogy, this condition reflects the dominance of a transmissive approach that prioritizes knowledge reproduction over meaning construction. The integration of retrieval and generation components within the RAG model represents the repositioning of technology as an epistemic mediator that bridges text and context. Analytically, this suggests a transformation from passive epistemology toward a constructive-digital epistemology, in which students no longer merely receive information but actively engage in synthesis grounded in validated references. In this sense, RAG functions as an instrument that strengthens academic ijtihad practices within contemporary learning environments.

During the development phase, the process of source curation emerged as a critical element in maintaining the epistemological integrity of Islamic education. Without rigorous curation, generative systems risk producing simplification or interpretive bias. These findings indicate that successful AI integration in Islamic education depends heavily on knowledge governance grounded in scholarly authority. Practices encouraging students to trace references, compare scholarly perspectives, and construct arguments based on scriptural evidence demonstrate that the model strengthens both source literacy and digital religious literacy. Analytically, the model integrates two dimensions often treated separately: the authority of classical texts and modern computational intelligence. This integration represents not merely technological adaptation but the reconstruction of a learning ecosystem that preserves the continuity of Islamic scholarly traditions within digital transformation.

From a pedagogical perspective, the reflective–analytical stages—contextual questioning, exploration, synthesis, and critical reflection—demonstrate that the RAG model operates within a higher-order thinking framework. Improvements in students' argumentative quality and depth of textual analysis indicate that generative technology, when guided by an appropriate methodological framework, can strengthen critical and contextual reasoning capacities. Theoretically, these findings expand the discourse on AI-assisted Islamic pedagogy, a paradigm that positions AI not as an authority of knowledge but as an epistemic partner subject to the principles of scriptural validity and Islamic scholarly methodology. The contribution of this study lies in formulating an integrative model that harmonizes Islamic intellectual traditions with retrieval-based generative technology, thereby opening new directions for the development of Islamic higher education that is adaptive, reflective, and firmly rooted in normative values.

Table 1. Research Findings

No	Dimension	Key Findings	Analysis & Implications
1	Needs-Based Design	The RAG model was developed from students' epistemic challenges, particularly fragmented understanding of religious texts.	Indicates a transformation from passive epistemology toward constructive-digital epistemology.
2	Technological Repositioning	Integration of retrieval and generation bridges text and context.	AI functions as an epistemic mediator and strengthens academic ijtihad practices.
3	Source Curation	Data verification through authoritative sources (Qur'an, tafsir, hadith, turath literature, academic works).	Knowledge governance maintains epistemological integrity and prevents AI bias.
4	Digital Religious Literacy	Students trace references, compare perspectives, and synthesize scriptural evidence.	Integration of source literacy and digital religious literacy.
5	Pedagogical Construction	Reflective–analytical stages (contextual questioning, exploration, synthesis, reflection).	Strengthening higher-order thinking and supporting AI-assisted Islamic pedagogy.
6	Conceptual Contribution	Harmonization of Islamic intellectual tradition with RAG technology.	An adaptive integrative model grounded in Islamic values for higher education.
7	Needs-Based Design (Validation)	The model consistently originates from students' epistemic needs.	Reinforces the shift from transmissive learning toward constructive-digital learning.

The findings of this study indicate that the design of a Retrieval-Augmented Generation (RAG)–based Islamic education model represents a paradigmatic transformation in pedagogical practice within higher education. The shift from a transmissive approach toward a constructive-digital approach emphasizes learning as meaning construction rather than mere information transmission. Theoretically, this shift aligns with constructivist paradigms that position learners as active agents in knowledge construction through reflective interaction with their learning environment.[17] In this context, RAG functions as an epistemic mediator that expands the dialogical space between religious texts, social realities, and learners as epistemic subjects.

The RAG-based learning stages—question formulation, source exploration through retrieval, synthesis through generation, and critical reflection—represent an active meaning-making cycle consistent with social constructivist theory. Vygotsky's concept of the zone of proximal development (ZPD) provides a foundation for understanding how systemic support (scaffolding) can expand students' cognitive capacity in engaging with complex literature. Within this model, the retrieval component provides authoritative reference-based scaffolding, while generation encourages higher-level cognitive elaboration. Technology therefore operates as a cognitive scaffold that strengthens students' conceptual integration of religious texts.

Furthermore, these findings reinforce the argument that technology in education is not a neutral entity but part of an epistemic ecosystem.[18] The integration of RAG demonstrates that artificial intelligence can function as a cognitive partner, as proposed in

[17] Ahmad dan Rahman, "Religious literacy among university students: Challenges in Islamic higher education."

[18] Bai, Jones, dan Wang, "Generative AI in education: Opportunities and pedagogical implications."

technology-enhanced learning theory.[19] In Islamic education, this function becomes particularly significant because it enables students to construct argumentation grounded in validated scriptural evidence.

From a digital literacy perspective, the model extends beyond instrumental approaches toward critical digital literacy. Digital literacy encompasses not only access to information but also evaluation of credibility, understanding of knowledge production contexts, and reflection on ethical implications. The findings indicate that students are trained to verify source authority, compare scholarly perspectives, and contextualize scriptural evidence within contemporary issues, thereby strengthening information literacy and source literacy simultaneously.

The curated database—including the Qur'an, tafsir, hadith, turath literature, and verified academic sources—demonstrates the presence of knowledge governance mechanisms within the learning architecture. This principle aligns with discussions on the reliability of generative AI systems emphasizing the importance of retrieval integration to reduce hallucination and informational distortion.[20] Consequently, the integration of RAG in Islamic education represents not only pedagogical innovation but also a methodological response to the epistemic challenges of generative AI.

Within the framework of Islamic epistemology, this model is consistent with the principle of integrating revelation (naqli) and reason ('aqli) as articulated in contemporary Islamic educational thought. Retrieval ensures connection to authoritative sources, while generation facilitates rational analysis and synthesis. This integration reflects an Islamic epistemological tradition that does not reject rationality but situates it within the normative framework of revelation.

Conceptually, the model avoids the dichotomy between tradition and technology. Discourses on the Islamization of knowledge emphasize value integration in scientific and technological development. In this context, RAG is positioned not as an independent epistemic authority but as an instrument operating under Islamic scholarly methodology. This positioning illustrates that digital transformation in Islamic education must be value-driven.

Theoretically, these findings contribute to the emergence of an AI-assisted Islamic pedagogy paradigm, which positions AI as a facilitator of meaning construction grounded in scriptural evidence. This paradigm expands contemporary Islamic pedagogical discourse by incorporating artificial intelligence as a controlled component of the epistemic ecosystem. The contribution is conceptual in nature, offering an integrative model that can be examined across diverse Islamic higher education contexts.

Empirically, improvements in students' argumentative quality and depth of textual analysis demonstrate the effectiveness of this approach in developing advanced religious literacy. These findings align with inquiry-based learning research showing increased critical and reflective thinking capacity.[21] The RAG model therefore demonstrates consistency between pedagogical design and students' cognitive outcomes.

Ultimately, this discussion highlights that integrating RAG into Islamic education constitutes an epistemological transformation encompassing ontological, methodological, and pedagogical dimensions. The conceptual model produced connects constructivism,

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[19] E M Bender et al., "On the dangers of stochastic parrots: Can language models be too big?," in *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency* (ACM, 2021), 610–23.

[20] Virginia Braun dan Victoria Clarke, "Using thematic analysis in psychology," *Qualitative Research in Psychology* 3, no. 2 (2006): 77–101.

[21] Brown et al., "Language models are few-shot learners."

digital literacy, and Islamic epistemology within an integrative framework responsive to the era of artificial intelligence. This contribution enriches international literature on AI in education while offering a normative perspective rooted in Islamic intellectual tradition, providing strong theoretical and practical significance for the global development of Islamic higher education.

Students' and Lecturers' Experiences and Perceptions of RAG Implementation in Islamic Education

Field findings indicate that students perceive the implementation of the Retrieval-Augmented Generation (RAG) model as a more dialogical and exploratory learning experience compared to conventional approaches. Students reported that the retrieval feature enabled systematic tracing of authoritative sources, while the generation feature encouraged the construction of more structured argumentative syntheses. In this process, students were motivated not merely to accept system responses but to verify references, compare scholarly perspectives, and relate scriptural evidence to contemporary social contexts. This experience reflects a shift from reproductive learning patterns toward reflective–analytical engagement, where technology functions as a trigger for cognitive elaboration rather than a provider of final answers.

From the lecturers' perspective, the RAG model was perceived as a pedagogical instrument that enriches classroom interaction. Lecturers observed that discussions became more argumentative because students arrived with more diverse and validated references. However, lecturers emphasized the importance of methodological guidance to prevent technological dependency and uncritical acceptance of generative outputs. Consequently, lecturers' roles shift from knowledge transmitters to facilitators of reflection and epistemic curators who guide students in reading, evaluating, and contextualizing religious literature responsibly.

Interactionally, the findings reveal collaborative dynamics among students, lecturers, and the RAG system in shaping a participatory learning ecosystem. Students actively posed contextual questions, the system provided curated reference-based responses, and lecturers facilitated critical reflection through methodological clarification. This pattern suggests that the development of critical, reflective, and analytical thinking emerges not from technology alone but from the integration of pedagogical design, source governance, and structured academic interaction. Thus, RAG implementation in Islamic education demonstrates potential as a medium that strengthens advanced religious literacy while maintaining epistemological integrity.

Findings regarding students' experiences in using the RAG model indicate a transformation from reproductive learning toward reflective and analytical meaning construction. This transformation aligns with constructivist paradigms that position learners as active subjects in building knowledge structures through engagement and reflection.[22] However, within the context of Islamic education, knowledge construction is not relativistic but remains bound to the principle of scriptural validity. In this regard, the RAG model demonstrates its epistemological relevance: students construct syntheses while grounding their interpretations in validated and curated references.

The retrieval component strengthens awareness of source authority, a principle that has long served as a foundation of Islamic scholarly tradition. In hadith methodology, for example, the verification of *sanad* (chain of transmission) and *matan* (textual content)

[22] Jean Piaget, *Genetic Epistemology* (New York: Columbia University Press, 1970).

constitutes a prerequisite for the validity of knowledge, as articulated by Ibn al-Ṣalāḥ in *Muqaddimah fī ʿUlūm al-Ḥadīth*.[23] This principle of epistemic caution parallels the function of retrieval within RAG systems, which emphasize traceability of references. Consequently, the integration of retrieval may be understood as the digitalization of the principle of *tahqīq* (verification) within contemporary learning contexts.

Meanwhile, the generation component encourages students to engage in argumentative elaboration that reflects the practice of academic *ijtihad*. Within the tradition of *uṣūl al-fiqh*, *ijtihad* is understood as an intellectual process of interpreting texts by considering context and rational deliberation, as articulated by al-Shāfiʿī in *al-Risālah*. In the RAG model, generation does not replace the process of *ijtihad* but provides an initial framework for synthesis that must be critically evaluated by both students and lecturers. This indicates that technology can function as a facilitator of *ijtihad* within clearly defined methodological boundaries.

From the perspective of Islamic epistemology, the integration of revelation (*naqli*) and reason (*ʿaqli*) constitutes a fundamental principle. Al-Ghazālī, in *al-Mustasfā*, emphasizes that reason serves as an instrument for understanding revelation rather than substituting for it. The RAG model reflects this principle: retrieval ensures connection to revelation and exegetical traditions, while generation facilitates students' rational engagement in elaborating meaning. Consequently, AI is positioned as a rational aid operating within normative boundaries. This integrative perspective is further reinforced by the discourse on the Islamization of knowledge advanced by Syed Muhammad Naquib al-Attas and Ismail Raji al-Faruqi. Both scholars emphasize the importance of integrating Islamic values into the development of knowledge and technology. The implementation of RAG in Islamic education demonstrates that digital transformation does not necessarily lead to epistemic secularization; rather, it can be directed toward strengthening Islamic scholarly values and methodologies through rigorous knowledge governance.

Within the context of digital literacy, these findings support the concept of *critical digital literacy* as articulated by Colin Lankshear and Michele Knobel, yet with a normative expansion grounded in Islamic epistemology. Students not only evaluate the credibility of sources at a technical level but also consider the validity of scholarly transmission (*sanad*) and the authority of religious scholars. Consequently, religious digital literacy in this model is normative-critical rather than merely instrumental.[24]

The dynamics of interaction among students, lecturers, and the RAG system resemble the *human-in-the-loop AI* model, in which human oversight remains central to knowledge production.[25] Within Islamic scholarly tradition, intellectual authority has always been embedded in chains of transmission and guided learning (*talaqqi*), as emphasized by Ibn Jamāʿah in *Tadhkirat al-Sāmiʿ wa al-Mutakallim*.[26] The RAG model preserves this principle by ensuring that lecturers continue to function as methodological guides and custodians of epistemic integrity.

The improvement in students' argumentative quality also reflects the practice of *tafaqquh fī al-dīn*—deep religious understanding that extends beyond textual memorization

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[23] Ibn Al-Salāḥ, *Muqaddimah fi 'Ulum al-Hadith* (Beirut: Dar al-Kutub al-'Ilmiyyah, n.d.).

[24] Colin Lankshear dan Michele Knobel, *Digital Literacies: Concepts, Policies and Practices* (New York: Peter Lang, 2008).

[25] Luciano Floridi et al., "AI4People—An Ethical Framework for a Good AI Society," *Minds and Machines* 28, no. 4 (2018): 689–707.

[26] Ibn Jama'ah, *Tadhkirat al-Sami' wa al-Mutakallim fi Adab al-'Alim wa al-Muta'allim* (Beirut: Dar al-Kutub al-'Ilmiyyah, n.d.).

toward analysis and contextualization. This concept has roots in classical tradition, as highlighted by Ibn Khaldūn in the *Muqaddimah*, which stresses the importance of understanding social structures and historical context when interpreting religious texts.[27] RAG facilitates this process through the integration of diverse and verified references.

Furthermore, these findings demonstrate that generative technologies can contribute to inquiry-based learning when guided through clear methodological frameworks. This expands the discourse of contemporary Islamic pedagogy by incorporating AI as part of an adaptive epistemic ecosystem. The paradigm of *AI-assisted Islamic pedagogy* emerging from this study positions AI as an epistemic partner rather than an independent authority, thereby preserving the hierarchy of knowledge sources within Islamic scholarship.[28]

Overall, the integration of constructivist perspectives, digital literacy, and Islamic epistemology indicates that the implementation of RAG constitutes a pedagogical transformation with both theoretical and normative legitimacy. The model is not only relevant in the context of technological innovation but also consistent with foundational principles of the Islamic intellectual tradition: verification (*tahqīq*), *ijtihād*, the integration of revelation and reason, and the continuity of scholarly transmission (*sanad*). Consequently, this study contributes through the formulation of an integrative framework that harmonizes artificial intelligence with Islamic epistemological tradition in a methodological and reflective manner, opening new pathways for the development of Islamic higher education in the era of global digital transformation.

Challenges, Opportunities, and Adaptive Strategies in Implementing an RAG-Based Islamic Education Model for Contextual Religious Literacy

Field findings indicate that the primary challenges in implementing a Retrieval-Augmented Generation (RAG)–based Islamic education model lie in the epistemic readiness and academic culture of institutions. Some lecturers and students still demonstrate technoskeptic tendencies, particularly concerns regarding potential distortion of scriptural meaning, algorithmic bias, and the risk of overreliance on generative systems. In addition, limited religious digital literacy and the absence of operational standards for knowledge governance constitute structural barriers to maintaining epistemic integrity. In this context, challenges are not merely technical but also normative and methodological, as they concern how technology is positioned within the hierarchy of Islamic scholarly authority in higher education.

At the same time, the study identifies significant opportunities for strengthening contextual religious literacy. The implementation of RAG enables the simultaneous integration of classical sources and contemporary scholarship, allowing students to connect normative texts with present social realities more effectively. Institutional digital infrastructure, innovation-friendly policies, and an academic culture that encourages argumentative dialogue emerge as key enabling factors. Findings suggest that when RAG systems are integrated with rigorous source curation and active lecturer supervision, learning becomes more reflective, dialogic, and evidence-based, thereby strengthening higher-level religious literacy.

As a response to these challenges, adaptive strategies observed in practice include three main approaches: (1) strengthening normative-digital literacy training for lecturers and

[27] Ibn Khaldun dan Franz Rosenthal, *The Muqaddimah: An introduction to history* (Princeton University Press, 1967).

[28] C E Hmelo-Silver, "Problem-based learning: What and how do students learn?," *Educational Psychology Review* 16, no. 3 (2004): 235–66.

students, (2) establishing source curation teams to maintain epistemic validity, and (3) integrating AI ethics guidelines into Islamic education curricula. These strategies indicate that the success of RAG implementation depends not solely on technological sophistication but on the reconstruction of an adaptive, value-driven academic ecosystem. Consequently, the implementation of this model requires synergy among institutional policy, pedagogical competence, and normative commitment to ensure that digital transformation remains aligned with Islamic epistemological principles and the goal of contextual religious literacy.

Findings concerning epistemic challenges suggest that the core issue is not technological readiness but the structure of academic reasoning embedded in institutional culture. From a social constructivist perspective, cognitive development occurs through symbolic mediation and social interaction.[29] RAG functions as a new symbolic mediator that reshapes students' reasoning patterns. However, without a clear methodological framework, such mediation risks producing surface reasoning rather than deep reasoning. Thus, the epistemic challenge lies in designing systems that stimulate analysis, evaluation, and synthesis—the highest levels of the revised Bloom taxonomy.[30]

From the perspective of formal and critical logic, the use of RAG opens space for strengthening deductive and inductive reasoning within Islamic studies. When students retrieve scriptural evidence and compare scholarly opinions, they engage in inductive inference; when synthesizing normative arguments, they move toward deductive and abductive reasoning. Accordingly, RAG expands students' logical structures from textual comprehension toward coherent epistemic argumentation. Concerns regarding algorithmic bias may be analyzed through the lens of information ethics, which emphasizes epistemic accountability in AI systems.[31] Logical validity depends not only on argumentative structure but also on the reliability of premises. Retrieval supported by curated sources reinforces premises, ensuring that students' arguments are not constructed on weak or unverifiable information. In this sense, the model integrates logical validity with epistemic validity.

The opportunity to integrate classical and contemporary sources reflects *integrative reasoning*—the ability to connect multiple conceptual frameworks to generate new understanding. Within Islamic epistemology, this integration aligns with the harmonization of revelation and reason emphasized by al-Ghazālī and expanded in the integrative thought of Syed Muhammad Naquib al-Attas. Students therefore move beyond citation toward contextualization, demonstrating contextual reasoning that deepens religious literacy.

Normative-digital literacy training can be understood as strengthening metacognitive reasoning. Students not only interpret scriptural content but also reflect on their own reasoning processes—source validity, interpretive consistency, and the avoidance of fallacies. Reflective learning theory identifies this metacognitive dimension as a core indicator of higher-order thinking, and directed RAG implementation enables self-regulated learning grounded in validated references.

The establishment of source curation teams and AI ethics guidelines reflects the principle of collective epistemic responsibility. In Islamic scholarly tradition, knowledge validity is maintained through chains of transmission and collective scholarly authority, as emphasized by Ibn Khaldūn. Institutional knowledge governance thus becomes a modern

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[29] Lev Semenovich Vygotsky, *Mind in Society: The Development of Higher Psychological Processes* (Cambridge, MA: Harvard University Press, 1978).

[30] L W Anderson dan D R Krathwohl, *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives* (Longman, 2001).

[31] Floridi et al., "AI4People—An Ethical Framework for a Good AI Society."

expression of this collective responsibility, ensuring that students' arguments are grounded in institutionally verified premises.

Overall, the integration of RAG in Islamic education may be understood as a reconstruction of the academic reasoning ecosystem. The model facilitates a transition from lower-order thinking toward higher-order reasoning. When guided by Islamic epistemology and AI ethics, RAG does not weaken textual authority but strengthens logical structure and argumentative quality. The resulting transformation therefore represents not merely digitalization of learning but an elevation of academic rationality grounded in scriptural validity and Islamic scholarly methodology.

D. Conclusion

The development of an RAG model based on a needs-based design demonstrates a significant contribution in transforming Islamic education from a transmissive paradigm toward a reflective and contextual constructive-digital epistemology. The integration of retrieval and generation components not only strengthens source literacy and religious digital literacy but also preserves scholarly integrity through mechanisms of curation and knowledge governance grounded in scriptural authority. Its implementation fosters a more dialogic and exploratory learning experience, in which students are encouraged to trace authoritative references, verify information, compare scholarly perspectives, and construct argumentative syntheses relevant to contemporary social realities. Within this context, the role of lecturers shifts toward that of reflective facilitators and epistemic curators who ensure that technology use remains critical and methodologically grounded. Although the model faces epistemic, normative, and cultural challenges—including concerns about algorithmic bias and limitations in knowledge governance—it retains strong potential to enhance higher-level religious literacy through adaptive strategies such as normative-digital literacy training, strengthened scholarly curation, and the integration of AI ethics into curricula. Consequently, the success of digital transformation in Islamic education depends on the reconstruction of an academic ecosystem that is adaptive, dialogic, and firmly rooted in Islamic epistemological principles and scholarly tradition.

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