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Vol. 2, Issue 4, December 2026; Page 378-400
DOI: https://doi.org/10.37304/jied.v2i4.27716
E-ISSN: 3123-3171
Journal of Islamic Education and Intellectual Discourse (JIED)

Responsible AI in Education Through an Islamic Ethical Framework: Integrating Human Agency, Cognitive Autonomy, and Academic Integrity

(Penggunaan Kecerdasan Buatan yang Bertanggung Jawab dalam Pendidikan melalui Kerangka Etika Islam: Mengintegrasikan Agensi Manusia, Otonomi Kognitif, dan Integritas Akademik)

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Article Information
Received :*August 16, 2026* Revised: *September 30, 2026* Accepted : *November 9, 2026* Publish : *November 16, 2026*

Please cite this article in APA Style as:
Mohamad Azhar Annawa UBM, Maharani, W. F., & Darmono, A. (2026). Responsible AI in education through an Islamic ethical framework: Integrating human agency, cognitive autonomy, and academic integrity. *Journal of Islamic Education and Intellectual Discourse, 2*(4), 378–400. https://doi.org/10.37304/jied.v2i4.27716

ABSTRACT

Purpose: This study synthesizes research on Responsible AI in education to develop an Islamic ethical framework that supports human agency, cognitive autonomy, and academic integrity. **Method:** We conducted a Systematic Literature Review (SLR) using PRISMA 2020 and analyzed 50 articles published between 2022 and 2026 from Scopus, Web of Science, ERIC, Dimensions, and Google Scholar. **Findings:** Research has shifted from technology acceptance toward ethics and governance, although it remains dominated by higher education and cross-sectional designs. Responsible AI principles include transparency, accountability, fairness, and human oversight. The Islamic perspective strengthens these principles through maqāṣid al-sharī'ah and the values of amanah, 'adl, ihsan, sidq, and tabayyun. The relationship between AI and human agency, cognitive autonomy, and academic integrity is conditional: reflective and verified use tends to support these dimensions, whereas dependence may undermine them. **Novelty:** This review's findings point to a shift from governance-centered responsibility to moral-epistemic responsibility, with three propositions: tabayyun as an obligation of epistemic verification, hifẓ al-'aql as an educational orientation, and integrating AI governance with moral-educational development. **Contribution:** This study provides a conceptual foundation for responsible AI use in Islamic education by placing human oversight, information verification, independent thinking, and academic integrity at its core. **Future Research:** Future studies should test these propositions through longitudinal and experimental designs and develop instruments that integrate Islamic ethical values, human agency, cognitive autonomy, and academic integrity.

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Keywords: Responsible AI, Human Agency, Cognitive Autonomy, Academic Integrity, Islamic Ethics

ABSTRAK

Tujuan: *Kajian ini bertujuan mensintesis penelitian mengenai Responsible AI dalam pendidikan untuk merumuskan kerangka etika Islam yang mendukung agensi manusia, otonomi kognitif, dan integritas akademik.* ***Metode:*** *Systematic Literature Review (SLR) berdasarkan PRISMA 2020 dengan menganalisis 50 artikel terbitan 2022–2026 dari Scopus, Web of Science, ERIC, Dimensions, dan Google Scholar.* ***Temuan:*** *Penelitian bergeser dari penerimaan teknologi menuju etika dan tata kelola, meskipun masih didominasi oleh pendidikan tinggi dan desain cross-sectional. Prinsip Responsible AI meliputi transparansi, akuntabilitas, keadilan, dan pengawasan manusia. Perspektif Islam memperkuatnya melalui maqāṣid al-sharī'ah serta nilai amanah, 'adl, ihsan, sidq, dan tabayyun. Hubungan AI dengan agensi manusia, otonomi kognitif, dan integritas akademik bersifat kondisional: penggunaan reflektif dan terverifikasi cenderung mendukung, sedangkan ketergantungan berisiko melemahkan.* ***Kebaruan:*** *Temuan kajian ini mengarah pada pergeseran dari governance-centered responsibility menuju moral-epistemic responsibility, dengan tiga proposisi: tabayyun sebagai kewajiban verifikasi epistemik, hifẓ al-'aql sebagai orientasi pendidikan, serta integrasi tata kelola AI dan pembentukan moral-edukatif.* ***Kontribusi:*** *Memberikan dasar konseptual penggunaan AI yang bertanggung jawab dalam pendidikan Islam dengan menempatkan pengawasan manusia, verifikasi informasi, kemandirian berpikir, dan integritas akademik sebagai inti.* ***Penelitian Selanjutnya:*** *Menguji proposisi melalui desain longitudinal, eksperimental, dan pengembangan instrumen yang mengintegrasikan nilai etika Islam, agensi manusia, otonomi kognitif, dan integritas akademik.*

Kata Kunci: *Kecerdasan Buatan yang Bertanggung Jawab, Agensi Manusia, Otonomi Kognitif, Integritas Akademik, Etika Islam*

1. Introduction

The development of artificial intelligence (AI) has expanded technology's role in education through intelligent tutoring systems (ITS), adaptive learning, and generative artificial intelligence (GenAI). AI supports learning by providing assistance, feedback, personalized instruction, and support for a range of academic activities (Holmes et al., 2022). This trend accelerated after the launch of ChatGPT in late 2022, which heightened interest in using GenAI in education, particularly in higher education (Eysenbach, 2023; Qian, 2025). In K–12 education, ITS has also demonstrated the potential to support learning, although its benefits depend on system design and implementation (Létourneau et al., 2025). GenAI is increasingly used for writing, feedback, problem-solving, and research support, and is becoming more deeply integrated into learning processes and knowledge production (Wang et al., 2026).

The expansion of AI use in education, particularly Islamic education, brings not only technical benefits and ethical risks but also epistemic concerns. When AI generates, explains, organizes, and represents information, questions arise about the boundaries of human intellectual responsibility in education. These concerns include scholarly authority, source verification, the human-knowledge

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relationship, and AI's role in transmitting and assessing knowledge (Rodianto et al., 2026; Suyono et al., 2026). Accordingly, AI should be understood not merely as a tool for improving learning efficiency but also as a technology that can influence how knowledge is accessed, verified, evaluated, and held accountable.

These issues pertain to Responsible Artificial Intelligence (Responsible AI), an approach that considers human interests, fairness, transparency, accountability, autonomy, agency, and the potential impacts of AI use (H. Zhu et al., 2025). In education, responsible AI use depends not only on system capabilities and efficiency but also on its effects on learners, educators, learning processes, and the relationship between humans and knowledge. Risks include bias, limited transparency, accountability concerns, and diminished human autonomy and control over decision-making (Holmes et al., 2022; H. Zhu et al., 2025). In Islamic education, these principles relate to source verification, responsibility for knowledge, educators' authority, and using technology to promote human welfare and moral responsibility (Makhsin et al., 2026; Sabri & Sulhan, 2026; Supriatin et al., 2025).

One important dimension of Responsible AI is human agency, defined as individuals' ability to set goals, make choices, direct actions, and retain control over decisions (Holmes et al., 2022). In learning contexts, agency encompasses the ability to determine learning goals, evaluate AI outputs, question claims, and take responsibility for decisions. Research on GenAI suggests that patterns of AI use may be associated with different forms of agency: AI can support engagement and self-regulation when users continue to direct the learning process, but it can also foster dependency when users increasingly delegate intellectual work to the system (Wang et al., 2026). This concept is related to cognitive autonomy, defined as the ability to maintain one's own processes of thinking, judgment, and decision-making through independent reasoning. Q. Zhu et al. (2026) distinguish dependent cognitive offloading, in which the primary thinking process is delegated to AI, from autonomous cognitive offloading, in which AI is used as temporary scaffolding while the user retains cognitive agency. Accordingly, responsible AI use requires learners to remain capable of understanding, verifying, questioning, and independently evaluating AI outputs.

Human agency and cognitive autonomy are also closely connected to academic integrity, which entails a commitment to honesty, trust, fairness, respect, responsibility, and courage in academic activities (International Center for Academic Integrity, 2021). Although generative AI (GenAI) can support academic activities, its use also raises concerns about plagiarism, misrepresentation of contributions, and dishonest academic practices, particularly when boundaries governing AI use are unclear or not observed responsibly (Bittle & El-Gayar, 2025; Kurnaesih et al., 2025). From an epistemic perspective, academic integrity encompasses not only academic honesty but also acknowledging sources of knowledge, carefully verifying information, and being accountable for the claims made. Accordingly, using AI as a supporting tool must be distinguished from transferring intellectual responsibility to the system.

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From an Islamic perspective, the use of AI should also be guided by the values of 'adl (justice), amanah (responsibility and trust), and ihsan (doing good to the highest standard), as well as the principle of maqāṣid al-sharī'ah, which emphasizes the protection and welfare of human beings (Faizah, 2025; Falah & Achfama, 2026). These values have epistemic dimensions relevant to AI use. Amanah is associated with accountability for the knowledge used and conveyed; tabayyun requires the examination and clarification of information; adab governs the relationship between humans, knowledge, and sources of knowledge; and hifẓ al-'aql emphasizes the protection of reasoning abilities and cognitive independence (Faizah, 2025; Ningsih & Sufiyan, 2026; Supriatin et al., 2025). These values align with Responsible AI principles by placing human beings, fairness, responsibility, and beneficial use at the center of technological considerations (Faizah, 2025; Falah & Achfama, 2026; Holmes et al., 2022).

However, research on Responsible AI, human agency, cognitive autonomy, and academic integrity, alongside research on Islamic ethics, has not yet been fully integrated into a unified analytical framework. Research on Responsible AI continues to focus primarily on AI ethics and governance, while its relationship to the epistemology of Islamic education remains underexplored (Holmes et al., 2022; H. Zhu et al., 2025). Research on Islamic ethics and AI also tends to be conceptual and normative, and translating values such as tabayyun, amanah, adab, and hifẓ al-'aql into learning indicators or procedures remains limited (Falah & Achfama, 2026; Supriatin et al., 2025). Meanwhile, research on human agency, cognitive autonomy, and academic integrity has advanced, but its relationship to Islamic epistemic concepts is rarely examined in an integrated manner (Ningsih & Sufiyan, 2026; Wang et al., 2026; Q. Zhu et al., 2026).

To address these gaps, this study conducts a Systematic Literature Review (SLR) in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al., 2021). It synthesizes research on Responsible AI in education, with particular attention to epistemic dimensions and Islamic ethical values. The review addresses four research questions: (RQ1) What are the characteristics and developments of Responsible AI research in education during the 2022–2026 period? (RQ2) What principles, dimensions, and indicators characterize the responsible use of AI in education? (RQ3) How is AI use associated with human agency, cognitive autonomy, and academic integrity? (RQ4) How are Islamic ethical values represented and operationalized in the responsible use of AI? The findings are expected to provide a conceptual foundation for an Islamic education framework that integrates Responsible AI, epistemic responsibility, human agency, intellectual autonomy, and academic integrity in AI-assisted learning.

2. Methods

This study employed a Systematic Literature Review (SLR) approach in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to

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identify, select, evaluate, and synthesize research on the responsible use of artificial intelligence (AI) in education (Page et al., 2021). The literature search covered five databases: Scopus, Web of Science, ERIC, Dimensions, and Google Scholar. It covered publications from January 2022 to July 2026. The search strategy comprised three keyword groups: the technology group, including artificial intelligence, generative AI, ChatGPT, and large language model; the education group, including education, learning, teaching, higher education, and K-12; and the responsibility and ethics group, including Responsible AI, ethics, academic integrity, human agency, cognitive autonomy, Islamic values, Islamic education, maqāṣid, amanah, adab, and tabayyun. The basic search string was as follows: ("artificial intelligence" OR "generative AI" OR "ChatGPT" OR "large language model" OR "LLM") AND (education OR learning OR teaching OR "higher education" OR "K-12") AND ("Responsible AI" OR ethics OR "academic integrity" OR "human agency" OR "cognitive autonomy" OR "Islamic values" OR "Islamic education" OR maqāṣid OR amanah OR adab OR tabayyun). We then adapted the search string to reflect the syntax and search characteristics of each database. The search yielded 187 initial records. We limited searches to publications in Indonesian or English and to the period from January 2022 to July 2026. We verified full-text open access availability during the eligibility assessment stage.

Articles were included if they met all of the following criteria: (1) they addressed the use of AI or generative AI in education; (2) they had a substantive connection to one or more dimensions of Responsible AI, human agency, cognitive autonomy, academic integrity, and/or Islamic ethical values; (3) they were published in Indonesian or English; (4) they were published between January 2022 and July 2026; and (5) they were available as full-text open-access publications. Articles were excluded if they (1) addressed only the technical aspects or effectiveness of AI, without relevance to responsibility, human agency, academic integrity, or Islamic ethical values; (2) were unavailable as full-text open-access publications; (3) were published in languages other than Indonesian or English; (4) fell outside the specified publication period; or (5) were duplicates.

The literature selection process followed the PRISMA 2020 stages of identification, screening, eligibility assessment, and inclusion (Page et al., 2021). At the identification stage, we retrieved 187 records from the five databases. After removing 41 duplicate records, 146 records remained for screening. We screened these records by title and abstract and excluded 68 articles that did not meet the relevance criteria. Specifically, these articles did not address AI or generative AI in education, lacked a substantive connection to Responsible AI, human agency, cognitive autonomy, academic integrity, or Islamic ethical values, or did not align with the research focus. The remaining 78 articles underwent full-text eligibility assessment. Of these, 28 were excluded because they did not meet the inclusion criteria. The primary reasons for exclusion were the absence of full-text open access, publication in a language other than Indonesian or English, publication outside the period from January 2022 to July 2026, a focus solely on the technical aspects or effectiveness of AI, or the absence of a substantive connection to responsibility, human agency, academic integrity, and Islamic ethical

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values. Accordingly, 50 articles met all inclusion criteria and were selected as the units of analysis for this study, as shown in Figure 1.

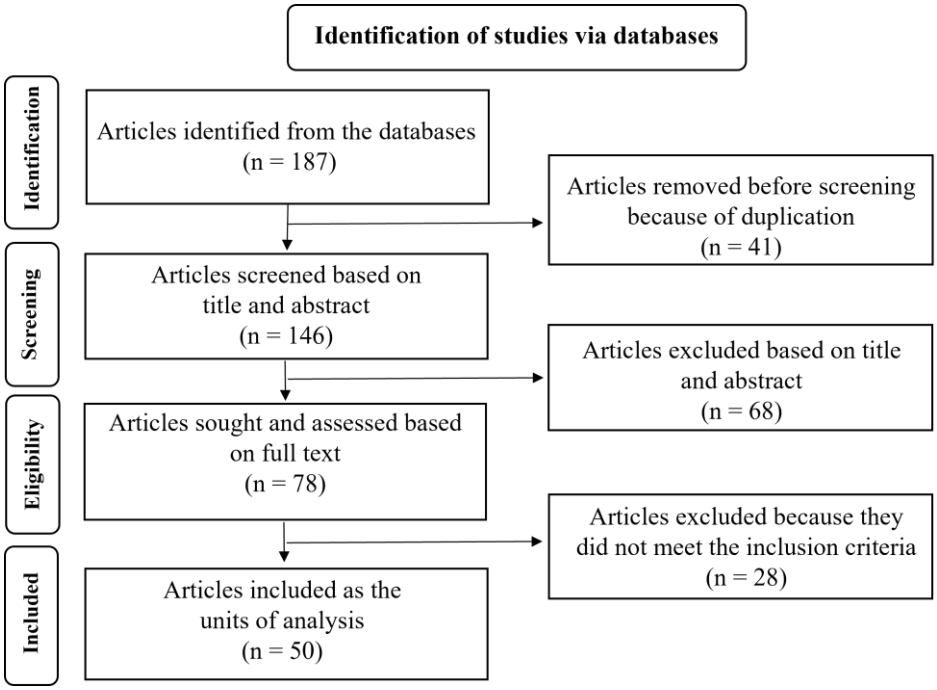


Figure 1. PRISMA 2020 Flow Diagram

Data from the selected articles were extracted according to publication and study characteristics; the types of AI or generative AI examined; the principles and dimensions of Responsible AI, human agency, cognitive autonomy, academic integrity, and Islamic ethical values; and the studies' main findings and limitations. The extracted data were then categorized according to conceptual and thematic similarities, compared across publications, and descriptively synthesized to address the four research questions. These categorization and synthesis processes identified patterns in the findings, relationships among themes, and research gaps warranting further investigation (Chong et al., 2022; Page et al., 2021).

3. Results and Discussion

We analyzed 50 articles that met the inclusion criteria and classified them into eight categories by research focus (Table 1). This classification mapped study characteristics, Responsible AI principles, relationships between AI use and human agency, cognitive autonomy, and academic integrity, and the representation and operationalization of Islamic ethical values. The synthesis not only compared findings across studies but also identified relationships among categories to clarify the Islamic ethical perspective's contribution to Responsible AI in education.

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Table 1. Categories of Research Focus in the Selected Articles

Ctg	Research Focus	n	Key Findings	Sources
K1	Conceptual Islamic ethical frameworks for AI in education (maqāṣid al-sharī'ah, adab)	12	AI can be conditionally accepted as long as its use aligns with the maqāṣid al-sharī'ah (hifẓ al-dīn, al-'aql, al-nafs, al-nasl, and al-māl). Teachers and Islamic scholars continue to maintain epistemic and moral authority.	Abbas & Mukhlisah (2026); Abdussyukur et al. (2026); Afifatun et al. (2025); Ajizah et al. (2025); Baharuddin et al. (2025); Falah & Achfama (2026); Farhan et al. (2026); Hakim et al. (2026); Khoiruddin & Dzulkifli (2026); Larhzizer et al. (2025); Makhsin et al. (2026); Sabri & Sulhan (2026)
K2	Empirical examination of Islamic values and AI	8	Sharia values such as amanah, 'adl, and ihsan can be examined as empirical constructs linked to integrity and educational outcomes. The Qur'an and Hadith provide the basis for formulating AI ethics principles.	Ahmad et al. (2025); Almajdoub et al. (2026); Azzahroh & Salim (2025); Budiyanto et al. (2025); Ibrohim et al. (2026); Kurnaesih et al. (2025); Madani et al. (2026); Mukaffan & Siswanto (2025)
K3	AI governance, policy, and conceptual models in education	5	AI governance emphasizes multilayered mechanisms at the government, institutional, and classroom levels, grounded in transparency, accountability, and human oversight.	Burke et al. (2025); Chapman & Dalgarno (2025); Dabis & Csáki (2024); DeLuca et al. (2026); A. Nguyen et al. (2023)
K4	Academic integrity and AI-based cheating	6	Cheating increased moderately after the emergence of ChatGPT, but direct measurement has not yet fully captured this increase. Guided AI use is positively associated with integrity, whereas excessive dependence is negatively associated with it.	Carvajal et al. (2026); Chen et al. (2024); H. M. Nguyen & Goto (2024); Salam et al. (2026); Si et al. (2026); Stöhr et al. (2024)
K5	Cognitive offloading, cognitive autonomy, and critical thinking	5	Dependence on AI is negatively correlated with critical thinking. Cognitive fatigue mediates this relationship, and information literacy moderates it.	Gerlich (2025); Hooper (2025); Katsenou et al. (2025); Tian & Zhang (2025); Zhai et al. (2024)
K6	Educator/ teacher agency in AI integration	5	Teacher agency is linked to AI literacy. Higher literacy helps maintain instructional authority, whereas limited training may reduce professional confidence.	Alasgarova & Rzayev (2025); Chaaban et al. (2025); Ghamrawi et al. (2026); Mouta et al. (2025); Tran Minh (2026)
K7	Behavior, perceptions, and individual factors among AI users	6	Personality and cultural background are linked to ethical tendencies in AI use. Cultural norms also shape perceptions of the ethical boundaries of AI use.	Al Ghani et al. (2026); Greitemeyer & Kastenmüller (2023); Ismail & Maharani (2026); Mumtaz et al. (2025); Pitaloka (2025); Prasetiyo et al. (2026)

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K8	Systematic reviews across themes	3	Attention has shifted from technology acceptance to ethical and governance issues. Ethical risks span technological, educational, and social aspects.	Evangelista (2025); Garzón et al. (2025); H. Zhu et al. (2025)

3.1. Characteristics and Development of Research on Responsible AI in Education

Research on responsible AI in education increased substantially between 2022 and 2026. The number of articles rose from one in each of 2022 and 2023 to six in 2024, 24 in 2025, and 18 through mid-2026. This pattern is consistent with the increase in AI research in education reported by Garzón et al. (2025). Research conducted in 2022–2023 focused primarily on general principles and predictors of academic dishonesty (Greitemeyer & Kastenmüller, 2023; A. Nguyen et al., 2023), whereas research in 2025–2026 expanded to address more specific issues, including Islamic ethics in AI use (Almajdoub et al., 2026; Madani et al., 2026).

Based on the research focus, 20 of the 50 articles (40%) examined Islamic ethics in AI use (K1–K2), while 30 articles (60%) addressed AI ethics and governance more broadly (K3–K8). These findings indicate that research on responsible AI has expanded beyond issues of technology acceptance to encompass governance, academic integrity, cognitive abilities, educator agency, and user behavior. From an Islamic perspective, AI use is primarily examined through the concepts of maqāṣid al-sharī'ah, adab, amanah, 'adl, and ihsan. Regarding research design, quantitative cross-sectional studies constituted the largest group, comprising 18 articles (36%), followed by systematic or scoping reviews (11 articles, 22%), conceptual or literature-based studies (7 articles, 14%), qualitative studies (5 articles, 10%), mixed-methods studies (4 articles, 8%), quasi-experimental studies (1 article, 2%), and other approaches (4 articles, 8%). The predominance of cross-sectional designs indicates that most empirical evidence was collected at a single point in time, making these designs better suited to describing relationships or patterns among variables than to establishing causal relationships.

By educational level, higher education constituted the most prevalent research setting, represented by 32 articles (64%). This was followed by studies spanning K–12 and higher education (8 articles, 16%); studies addressing education generally or multiple educational levels (5 articles, 10%); primary and secondary education (3 articles, 6%); informal or family education (1 article, 2%); and one article (2%) that did not specify the educational level. These findings indicate that research on responsible AI has focused more extensively on university students and higher education settings than on school students.

Geographically, most studies originated in Southeast Asia, particularly Indonesia, which accounted for 22 articles (44%). Cross-country or multi-regional studies accounted for 8 articles (16%), while Europe and the Middle East each contributed 4 articles (8%); Oceania and East Asia each contributed 3 articles (6%); Africa contributed 2 articles (4%); and North America, Central

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Asia/Caucasus, and Latin America each contributed 1 article (2%). Studies examining AI ethics from an Islamic perspective were also conducted predominantly in Indonesia, with additional studies originating in Morocco (Larhzizer et al., 2025), Nigeria and Pakistan (Ahmad et al., 2025), and the United Arab Emirates (Almajdoub et al., 2026).

Sample sizes in empirical studies ranged from N = 22 (Chaaban et al., 2025) to N = 5,894 (Stöhr et al., 2024), reflecting differences in research scope and participant characteristics. Researchers should account for this variation when comparing findings across publications, particularly regarding research design, respondent characteristics, and sample size.

Table 2. Methodological Characteristics of the Studies

Characteristic	Category	n (%)
Research design	Quantitative cross-sectional	18 (36%)
	Systematic review/scoping review	11 (22%)
	Conceptual/literature review	7 (14%)
	Qualitative	5 (10%)
	Mixed-methods	4 (8%)
	Quasi-experimental	1 (2%)
	Other (Q-methodology, list experiment, cluster analysis)	4 (8%)
Educational level	Higher education	32 (64%)
	Across K-12 and higher education	8 (16%)
	General/across educational levels	5 (10%)
	Primary and secondary education	3 (6%)
	Informal/family education	1 (2%)
	Not specified	1 (2%)
Geographical region	Southeast Asia (predominantly Indonesia)	22 (44%)
	Multi-regional/cross-national	8 (16%)
	Europe	4 (8%)
	Middle East	4 (8%)
	Oceania	3 (6%)
	East Asia	3 (6%)
	Africa	2 (4%)
	North America	1 (2%)
	Central Asia/Caucasus	1 (2%)
	Latin America	1 (2%)
	Not specified	1 (2%)

3.2. Principles, Dimensions, and Indicators of Responsible AI Use in Education

The principles governing responsible AI use in education fall into two broad orientations: general governance and Islamic ethics. General principles include transparency, accountability, fairness, privacy, security, inclusivity, and human oversight (Dabis & Csáki, 2024; A. Nguyen et al.,

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2023). In contrast, research grounded in Islamic perspectives draws on maqāṣid al-sharīʿah, adab, amanah, ʿadl, ihsan, sidq, and tabayyun as normative foundations for AI use (Ahmad et al., 2025; Falah & Achfama, 2026). These orientations share an emphasis on responsibility, human protection, fairness, and the governance of AI use, while differing in their normative foundations and ultimate objectives.

In non-Islamic research, the dimensions most frequently identified include transparency or explainability, accountability, fairness or non-discrimination, privacy and data protection, and human oversight. Ahmad et al. (2025) identify transparency, accountability, sustainability, privacy, security, inclusivity, and a human-centered approach as important elements of AI use. Dabis & Csáki (2024) demonstrate that higher education policies address AI through accountability and responsibility, human agency and oversight, transparency and clarity, and inclusivity and diversity. In Islam-based research, maqāṣid al-sharīʿah and adab serve as the primary frameworks. The five objectives of protection—ḥifẓ al-dīn, ḥifẓ al-ʿaql, ḥifẓ al-nafs, ḥifẓ al-nasl, and ḥifẓ al-māl—are used to assess the alignment of AI use with educational objectives and human welfare, while amanah, ʿadl, ihsan, sidq, and tabayyun elucidate responsibility, fairness, integrity, and information verification.

Some studies have translated these normative values into constructs or observable indicators. Madani et al. (2026) demonstrate the relationship between amanah, ʿadl, and ihsan and AI integration and ethical decision-making, while Abbas & Mukhlisah (2026) associate adab with academic responsibility, honesty, and respect for sources of knowledge. Other studies have begun to measure fairness, transparency, accountability, privacy, social well-being, and ethical AI use. However, researchers still operationalize Islamic values inconsistently. Sabri & Sulhan (2026), Afifatun et al. (2025), Ahmad et al. (2025), and Baharuddin et al. (2025) continue to discuss these values at the conceptual level. Makhsin et al. (2026) present a more operational approach through the 3S protocol (Semak, Saring, Sebar), which is based on tabayyun, although its effectiveness requires further empirical testing.

Overall, the literature identifies at least four levels at which Islamic ethics are represented in AI use: normative principles, ethical dimensions, behavioral indicators, and usage procedures. However, the extent to which these levels have been operationalized remains inconsistent. Accordingly, conceptual principles should not be treated as equivalent to measured and validated constructs. This suggests that research on Islamic ethics and AI is beginning to move toward empirical investigation, but has yet to establish a consistent measurement system.

3.3. Relationship Between AI Use and Human Agency, Cognitive Autonomy, and Academic Integrity

The relationship between AI use, human agency, cognitive autonomy, and academic integrity is conditional, depending on purpose, degree of dependence, patterns of human–AI interaction, reflective capacity, information literacy, and oversight quality. Thus, AI use frequency cannot serve

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Vol. 2, Issue 4, December 2026; Page 378-400
DOI: https://doi.org/10.37304/jied.v2i4.27716
E-ISSN: 3123-3171
Journal of Islamic Education and Intellectual Discourse (JIED)

as the sole indicator of its educational benefits or risks. A relatively consistent relationship emerges between cognitive offloading and critical thinking. Gerlich (2025) found a negative relationship between AI use and critical thinking, with cognitive offloading serving as an important mechanism. Tian & Zhang (2025) showed that AI dependence is associated with lower levels of critical thinking, with cognitive fatigue serving as a mediator and information literacy as a factor influencing this relationship. Zhai et al. (2024) also showed that excessive dependence on AI dialogue systems can affect users' cognitive abilities. However, cognitive offloading does not always indicate cognitive failure. Hooper (2025) distinguishes between using AI as a cognitive aid and dependence that reduces user engagement. Meanwhile, Si et al. (2026) identified variations in AI use patterns, ranging from using AI as a thinking partner to patterns involving higher levels of dependence. These findings indicate that AI can support cognitive processes when users continue to evaluate and reflect. However, risks may arise when AI replaces reasoning processes that users should undertake.

In the dimension of human agency, AI is associated with humans' ability to control, evaluate, and decide how to use technology. Alasgarova & Rzayev (2025) showed that AI integration can alter teacher–student relationships and challenge instructional authority, whereas AI literacy can help teachers maintain professional control. Ghamrawi et al. (2026) view agency as an outcome of reciprocal relationships between individuals and technology, while Chaaban et al. (2025) found variations in pre-service teachers' agency patterns, ranging from relatively independent AI use to patterns involving greater dependence. These findings indicate that AI does not inherently strengthen or weaken human agency; rather, its effects are associated with literacy, reflective capacity, purposes of use, and the educational environment.

A similar pattern appears in academic integrity. Chen et al. (2024) reported increased plagiarism after using ChatGPT, whereas H. M. Nguyen & Goto (2024) showed that direct questioning can produce lower estimates of cheating than indirect measurement techniques. These findings indicate that results based on self-reports should be interpreted with caution. In contrast, Salam et al. (2026) found that purposeful use of ChatGPT may be associated with better academic integrity, whereas excessive dependence was associated with lower academic integrity. These differences should not necessarily be seen as contradictions, as they may reflect differences in constructs, instruments, sample characteristics, and patterns of AI use. Chen et al. (2024) focused on plagiarism; H. M. Nguyen & Goto (2024) used indirect measurement to reduce social desirability bias, whereas Salam et al. (2026) examined academic integrity based on students' self-reports. Therefore, the available evidence is not yet sufficient to position AI as the sole cause of changes in academic integrity.

In Islamic education, this issue becomes more specific because AI use is not only related to learning efficiency but also to responsibility for the knowledge obtained and communicated. Abbas & Mukhlisah (2026) and Abdussyukur et al. (2026) emphasize the importance of guidance, verification, and human responsibility in AI use. AI can be positioned as an assistive tool, but

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E-ISSN: 3123-3171
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humans still decide whether to accept, modify, use, or disseminate its outputs. This position aligns with the self-regulated learning approach and the social-cognitive agency perspective, which view behavior, individual capacity, and the environment as mutually influencing elements (Chaaban et al., 2025; Mouta et al., 2025).

Overall, human agency, cognitive autonomy, and academic integrity relate more to how AI is positioned within the educational process than to its mere presence or frequency of use. Purposeful, reflective use with verification helps users retain control over cognitive processes and academic decision-making, whereas dependence, uncritical acceptance of outputs, and weak oversight increase the risk of reduced autonomy and integrity. Therefore, AI literacy, information literacy, metacognitive skills, source verification, and assessment design are important components of responsible AI implementation.

Table 3. Integrative Patterns across Categories

Stage	Category	Focus	Contribution
Governance	K3, K8	Transparency, accountability, fairness, privacy, human oversight	Provides mechanisms for control and accountability
Human–AI–knowledge relations	K4, K5, K6	Integrity, cognitive offloading, cognitive autonomy, agency	Connects governance with thinking processes and decision-making
Moral-epistemic orientation	K1, K2	Maqāṣid al-sharīʿah, amanah, ʿadl, ihsan, tabayyun, ḥifẓ al-ʿaql	Provides normative direction and educational goals
Individual and contextual factors	K7	Culture, personality, perceptions, ethical tendencies	Explains variations in internalization and AI use practices

3.4. Representation and Operationalization of Islamic Ethical Values in Responsible AI

Islamic ethical values in AI use are represented through three interrelated layers, namely maqāṣid al-sharīʿah as a goal-oriented framework, ethical values as moral principles, and indicators and procedures as forms of operationalization.

3.4.1. Maqāṣid al-sharīʿah as a Goal-Oriented Framework

Maqāṣid al-sharīʿah helps assess whether AI use supports maṣlaḥah and protective objectives within Islamic ethics. In education, ḥifẓ al-ʿaql is particularly relevant because it concerns preserving thinking abilities, reasoning, and intellectual autonomy. Meanwhile, ḥifẓ al-dīn, ḥifẓ al-nafs, ḥifẓ al-nasl, and ḥifẓ al-māl can address the protection of religious values, life, generational continuity, and ownership and economic interests, respectively (Falah & Achfama, 2026; Sabri & Sulhan, 2026). Budiyanto et al. (2025) also link Islamic epistemology to strengthening students' epistemic autonomy. The relevance of ḥifẓ al-ʿaql grows when AI use is linked to AI dependence, cognitive offloading, and reduced user engagement in evaluation. Thus, protecting the intellect is not limited to preventing inaccurate information; it also encompasses preserving human thinking processes as an educational objective.

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E-ISSN: 3123-3171
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3.4.2. Ethical Values as Principles of Use

The values of amanah, ʿadl, ihsan, sidq, and ḥurmah translate these normative objectives into AI use behaviors. Amanah concerns responsibility for information and technology; ʿadl concerns fairness and nondiscriminatory treatment; ihsan concerns the quality of actions and a higher level of responsibility; sidq concerns honesty; while ḥurmah concerns respect for human beings and boundaries that must not be violated. Ahmad et al. (2025) position ʿadl, amanah, and ḥurmah as foundations for justice, integrity, and respect for human beings. Abdussyukur et al. (2026) emphasize that delegating some cognitive tasks to AI does not eliminate human moral responsibility for final decisions. Madani et al. (2026) also demonstrate the relationship between amanah, ʿadl, and ihsan and AI integration and ethical decision-making.

3.4.3. Tabayyun as an Epistemic Verification Practice

Among the Islamic values identified, tabayyun is one of the concepts most clearly translated into observable behavior. Makhsin et al. (2026) developed the 3S protocol (Semak, Saring, Sebar) to examine AI outputs before using or disseminating them in learning. Ibrohim et al. (2026) demonstrate its application by comparing AI-generated answers with other sources, while Kurnaesih et al. (2025) identify practices for verifying AI-generated information, though some uses still show copy-and-paste patterns without paraphrasing. In this synthesis, tabayyun is not limited to fact-checking but also positions verification as the user's epistemic responsibility before information is accepted, used, or communicated to others.

3.4.4. The Relationship between Responsible AI and Islamic Ethical Values

Islamic values connect functionally with several principles of responsible AI, but the two are not identical. The literature maps points of convergence between modern governance mechanisms and Islamic normative values.

Table 4. Relationship between Responsible AI Principles and Islamic Ethical Values

Responsible AI Principle	Relevant Islamic Value	Form of Relationship
Accountability	Amanah	Responsibility in AI-assisted use and decision-making
Fairness/non-discrimination	‘Adl	Fair treatment and decision-making
Transparency/explainability	Shafafiyah	Openness of information and processes
Verification/human oversight	Tabayyun	Examination and clarification of information
Protection of thinking abilities/human agency	Hifẓ al-‘aql	Maintaining human control and thinking abilities
Integrity	Ihsan/sidq	Honesty and responsibility in the use of AI
Privacy and protection of dignity	Hurma/hifẓ al-‘ird	Respect for human dignity and protection of individuals

The mapping shows that the Islamic perspective does not replace Responsible AI principles; instead, it provides normative guidance for their application. The generic Responsible AI framework

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E-ISSN: 3123-3171
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primarily addresses how AI is designed, used, monitored, and held accountable through transparency, accountability, auditability, and human oversight (Chapman & Dalgarno, 2025). The Islamic perspective adds questions concerning the purposes of AI use, users' attitudes toward AI-generated knowledge, and the moral responsibility inherent in its use (Hakim et al., 2026). Thus, governance mechanisms and moral-educational formation serve different yet complementary functions: governance provides rules, procedures, and oversight structures, whereas moral-educational formation develops users' dispositions to implement these mechanisms responsibly.

This contribution is particularly reflected in the concepts of tabayyun and ḥifẓ al-ʿaql. Tabayyun does not replace verification, human oversight, explainability, or fact-checking mechanisms within Responsible AI. Rather, it extends these mechanisms by emphasizing the user's epistemic obligation associated with amanah and mas'ūliyyah. Accordingly, responsibility does not rest solely with the systems or institutions that provide verification mechanisms, but also with individuals who receive, evaluate, and disseminate information. Meanwhile, ḥifẓ al-ʿaql extends the discussion of human agency and cognitive autonomy: these are no longer viewed merely as risks to be mitigated, but also as educational goals to be preserved. From this perspective, ethical concerns relate not only to the accuracy of AI outputs, but also to whether its use can preserve students' capacity to understand, evaluate, reason, and make decisions independently.

Based on this synthesis, the contribution of Islamic ethics can be formulated as an extension from governance-centered responsibility toward moral-epistemic responsibility. This extension encompasses three principal relationships: (1) responsibility is not assigned solely to institutions and systems, but also to users as moral agents; (2) verification is positioned not only as a mechanism for controlling AI outputs, but also as an epistemic obligation through tabayyun; and (3) cognitive autonomy is understood not only as a condition that needs to be preserved, but also as an educational goal that needs to be developed and protected through ḥifẓ al-ʿaql. Thus, Islamic ethics provides normative depth and educational orientation for Responsible AI mechanisms rather than replacing them.

Based on these relationships, this study proposes that Responsible AI in Islamic education should integrate governance mechanisms with moral-educational formation. This integration positions tabayyun as a verification practice, ḥifẓ al-ʿaql as an orientation toward protecting reasoning capacity, and amanah and mas'ūliyyah as foundations of user responsibility. Therefore, assessing Responsible AI in education should not be limited to compliance with rules; it should also encompass the quality of verification, value internalization, patterns of dependence on AI, human agency, cognitive autonomy, and academic integrity. These three relationships constitute conceptual propositions derived from a synthesis of the literature and still require empirical testing. Accordingly, this study's principal theoretical contribution is a shift from governance-centered responsibility to moral-epistemic responsibility: a framework that connects AI governance with the formation of responsible individuals in acquiring, verifying, using, and communicating knowledge.

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DOI: https://doi.org/10.37304/jied.v2i4.27716
E-ISSN: 3123-3171
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3.4.5. Gaps and Research Directions for Responsible AI in Education

Research on Responsible AI in education continues to reveal several gaps. First, cross-sectional designs remain predominant, while longitudinal and experimental studies are relatively limited. Consequently, the literature has limited ability to explain causal relationships between AI use and changes in human agency, cognitive autonomy, and academic integrity. Longitudinal research is needed to determine whether dependence on AI remains stable, increases, or changes with educational interventions. Second, research has focused more heavily on higher education, while studies examining primary education, secondary education, and family environments remain limited. This gap matters because cognitive abilities, technological experience, guidance patterns, and levels of learner independence differ across educational levels. Future research needs to examine Responsible AI principles across different stages of learner development, rather than focusing solely on university students.

Third, research on Islamic ethics and AI remains concentrated in Indonesia. Findings from Morocco, Nigeria, Pakistan, and the United Arab Emirates are beginning to emerge, but their coverage remains disproportionate to Indonesia's dominance in the field. Cross-national research is needed to examine how maqāṣid al-sharīʿah, amanah, ʿadl, tabayyun, and other ethical values apply within Muslim educational systems shaped by diverse social, cultural, and policy contexts. Fourth, empirical research has not widely tested the relationship between cognitive mechanisms and Islamic ethical values. Research on AI dependence, cognitive fatigue, and cognitive offloading has demonstrated associations between AI use and critical thinking and cognitive abilities. However, these mechanisms have rarely been directly linked to maqāṣid al-sharīʿah, particularly ḥifẓ al-ʿaql. Consequently, the protection of intellect has more often been formulated as a normative principle than as a measurable construct.

Fifth, the operationalization of Islamic ethical values remains unstandardized. Some studies have developed indicators, constructs, and procedures encompassing amanah, ʿadl, ihsan, and tabayyun protocols, whereas others remain at the conceptual level. Therefore, researchers need to develop and validate instruments that link these values to AI use behavior, human agency, cognitive autonomy, and academic integrity, while accounting for construct validity, reliability, cross-cultural validity, and the distinction between perceived values and actual behavior. Sixth, academic integrity measurement still relies heavily on self-report. Findings by H. M. Nguyen & Goto (2024) indicate that indirect measurement methods can produce different estimates of cheating behavior from those obtained through direct questioning. Therefore, future research should triangulate self-report, measures of actual behavior, task artifact analysis, and indirect measurement methods in line with the research objectives.

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Vol. 2, Issue 4, December 2026; Page 378-400
DOI: https://doi.org/10.37304/jied.v2i4.27716
E-ISSN: 3123-3171
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Seventh, the theoretical contribution of Islamic ethics to Responsible AI has not yet been explicitly formulated to a substantial extent. The synthesis of the studies in this research indicates that tabayyun can extend verification into epistemic responsibility, while ḥifẓ al-ʿaql extends attention to human agency and cognitive autonomy as educational goals that need protection. However, these relationships remain a conceptual synthesis that requires empirical testing. Future research should examine changes in verification quality, cognitive autonomy, and academic integrity, and identify the conditions that influence them. Eighth, comparative research should examine the distinction between governance mechanisms and moral-educational formation. Such research could compare rule-, procedure-, and oversight-based approaches with approaches that integrate these mechanisms with amanah, tabayyun, ḥifẓ al-ʿaql, and other ethical values. Outcome variables could include human agency, cognitive autonomy, academic integrity, information verification quality, and patterns of AI dependence.

Based on these gaps, the future research agenda is directed toward four main areas of development: (1) expanding longitudinal, experimental, and quasi-experimental designs to examine causal mechanisms; (2) expanding the scope of populations to include primary and secondary education, families, and various Muslim-majority countries; (3) developing instruments that integrate maqāṣid al-sharīʿah, tabayyun, amanah, human agency, cognitive autonomy, and academic integrity; and (4) combining multiple measurement methods, including behavioral analysis, cluster analysis, Q-methodology, and indirect measurement techniques, to identify patterns of AI use more accurately.

Overall, Responsible AI requires not only rules and oversight but also cultivating epistemic responsibility through tabayyun, protecting intellect through ḥifẓ al-ʿaql, and applying amanah and mas'ūliyyah in AI use. This framework can provide a foundation for empirical research and instrument development to examine AI use while preserving human agency, cognitive autonomy, knowledge verification, and academic integrity in Islamic education.

4. Conclusion

Research on Responsible AI in education shows a growing number of publications and a shift in focus from technology acceptance to ethics, governance, academic integrity, and human agency. Nevertheless, this body of research is still dominated by cross-sectional designs, higher education contexts, and Indonesian settings (RQ1). Responsible AI use encompasses transparency, accountability, fairness, privacy, and human oversight. From an Islamic perspective, these principles are reinforced by maqāṣid al-sharī'ah as well as the values of amanah, 'adl, ihsan, sidq, and tabayyun, although their operationalization remains empirically limited (RQ2). The impact of AI on human agency, cognitive autonomy, and academic integrity is conditional. Reflective and verified use that remains under human control tends to support these three dimensions, whereas

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Vol. 2, Issue 4, December 2026; Page 378-400
DOI: https://doi.org/10.37304/jied.v2i4.27716
E-ISSN: 3123-3171
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dependence and use without evaluation may weaken them (RQ3). Islamic ethical values are represented through maqāṣid al-sharī'ah as a goal-oriented framework, moral values as principles, and tabayyun as a practice of epistemic verification. However, this approach is not yet supported by consistent measurement systems or sufficient empirical evidence (RQ4). **The findings** of this review indicate a shift from governance-centered responsibility toward moral-epistemic responsibility, positioning human moral and epistemic responsibility at the core of AI use in education. This framework is formulated through three propositions: tabayyun as the user's obligation to conduct epistemic verification, ḥifẓ al-'aql as an educational objective for safeguarding the capacity for thinking, and the integration of AI governance with moral and educational development. Accordingly, Responsible AI in Islamic education needs to be human-centered and morally grounded. AI functions as a supporting tool, while judgment, intellectual autonomy, verification, and ethical responsibility remain with humans. Future research should test these propositions through longitudinal and experimental designs, expand research populations across educational levels and Muslim-majority countries, and develop empirical instruments that link Islamic ethical values with human agency, cognitive autonomy, and academic integrity.

Acknowledgements:
The author would like to express their sincere gratitude to Institut Agama Islam Ngawi, Indonesia for its valuable support, guidance, and encouragement throughout the research process. The institutional support and opportunities provided have contributed meaningfully to the completion of this study.

Ethical Statement
This study does not involve human participants, interviews, surveys, or the collection of personal data. Therefore, ethical approval and informed consent were not required. The research was conducted through normative legal analysis and library research using legal regulations, academic literature, and other publicly available scholarly sources.

Declaration of conflicting interest
The authors of this article declare that the authors have no potential conflict of interest

Author contribution
Mohamad Azhar Annawa UBM contributed to conceptualization, methodology, investigation, formal analysis, supervision, project administration, and writing – review and editing. **Wulan Feronika Maharani** contributed to investigation, data curation, validation, visualization, and writing – original draft. **Al Darmono** contributed to conceptualization, methodology, investigation, resources, formal analysis, and writing – review and editing. All authors contributed to the intellectual development of the study, reviewed and approved the final version of the manuscript, and agreed to be accountable for all aspects of the work.

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Vol. 2, Issue 4, December 2026; Page 378-400
DOI: https://doi.org/10.37304/jied.v2i4.27716
E-ISSN: 3123-3171
Journal of Islamic Education and Intellectual Discourse (JIED)

Funding

This article does not receive or have any financial support from any sponsor or institution

Data Availability Statement

The authors confirm that the data presented in this study were obtained from the research field. All relevant data are available in this article. Further information regarding data availability may be obtained from the authors upon reasonable request

AI Usage Declaration

The authors declaire no used AI Tools

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