

**BEYOND CONVENTIONAL DIGITAL ASSESSMENT:  
DEVELOPING AN AI DRIVEN ETHICAL SPIRITUAL  
ASSESSMENT FRAMEWORK INTEGRATING INFORMATICS  
COMPETENCIES LEARNING ANALYTICS AND HUMAN  
CENTERED ISLAMIC EDUCATION**

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| Keywords:                                                                                                                                  | Abstract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| Artificial Intelligence In Education, Ethical-Spiritual Assessment, Informatics Competencies, Learning Analytics, Islamic Higher Education | <p>The rapid integration of artificial intelligence (AI), learning analytics, and digital technologies has transformed educational assessment, creating opportunities for more adaptive, data-driven, and personalized evaluation. However, digital assessment practices in Islamic higher education frequently prioritize cognitive achievement and technological efficiency while giving limited attention to ethical, spiritual, and human-centered dimensions of learning. This conceptual study aims to develop an AI-driven Ethical-Spiritual Assessment Framework that integrates informatics competencies, learning analytics, and Islamic educational values to support holistic assessment in postgraduate Islamic education. Employing a qualitative library research design, the study critically synthesizes literature on digital assessment, artificial intelligence in education, learning analytics, informatics education, authentic assessment, and Islamic educational philosophy. The proposed framework comprises five interconnected dimensions: AI-assisted assessment, informatics competencies, learning analytics, ethical-spiritual evaluation, and human-centered learning. These dimensions collectively promote balanced assessment by evaluating cognitive achievement, digital competence, ethical responsibility, spiritual development, and reflective learning. The framework contributes to the advancement of assessment theory by bridging emerging educational technologies with Islamic educational philosophy, offering a sustainable model for competency-oriented, ethical, and human-centered assessment in postgraduate Islamic education.</p> |

**INTRODUCTION**

The rapid advancement of Artificial Intelligence (AI), learning analytics, big data, and digital technologies has fundamentally transformed educational assessment in higher education (Sofa, 2026). Traditional assessment practices that primarily measure students' cognitive achievement through written examinations are increasingly being replaced by intelligent digital assessment systems capable of providing real-time feedback, adaptive evaluation, and personalized learning support. In postgraduate education, particularly within informatics and technology-enhanced learning environments, assessment has

evolved into a continuous process that utilizes artificial intelligence and educational data to monitor students' progress, identify learning patterns, and facilitate evidence-based instructional decisions. These developments present significant opportunities for improving assessment quality while simultaneously introducing ethical, pedagogical, and spiritual challenges that require careful consideration (Sa'diya et al., 2026).

In postgraduate Islamic education, assessment is expected to reflect the holistic philosophy of Islamic education, which seeks to develop intellectual excellence alongside spiritual maturity, ethical responsibility, and social accountability. Nevertheless, many existing digital assessment systems remain predominantly technology-driven, emphasizing efficiency, automation, and measurable academic performance while paying insufficient attention to students' moral character, spiritual growth, and responsible use of digital technologies. Furthermore, the increasing integration of AI and learning analytics raises important concerns regarding algorithmic bias, data privacy, academic integrity, transparency, and the ethical use of educational data. These issues highlight the necessity of reconstructing digital assessment frameworks that align technological innovation with the ethical and spiritual principles of Islamic education (Mh et al., 2026).

At the same time, the emergence of informatics competencies has become an essential component of postgraduate education in the digital era. Beyond technical skills such as computational thinking, programming, data literacy, artificial intelligence literacy, cybersecurity awareness, and digital problem-solving, postgraduate students are expected to demonstrate responsible, ethical, and reflective engagement with digital technologies. Contemporary educational frameworks increasingly emphasize that informatics competencies should be integrated with critical thinking, digital citizenship, collaboration, and lifelong learning. Within Islamic education, these competencies should also be guided by the principles of *amanah* (trustworthiness), *'adl* (justice), *ihsan* (excellence), *maslahah* (public benefit), and accountability before God, ensuring that technological advancement contributes to human well-being rather than merely improving technical performance (Qomariah et al., 2026).

Although previous studies have discussed digital assessment, artificial intelligence in education, learning analytics, informatics education, and Islamic educational philosophy separately, limited research has integrated these perspectives into a unified assessment framework for postgraduate Islamic education. Existing models often prioritize technological efficiency or educational effectiveness without adequately incorporating ethical-spiritual values and human-centered learning principles. Therefore, this study aims to develop an AI-Driven Ethical-Spiritual Assessment Framework that integrates informatics competencies, learning analytics, and human-centered Islamic education. The proposed framework seeks to extend the discourse on digital assessment by providing a holistic conceptual model that balances technological innovation with ethical responsibility, spiritual development, competency-based learning, and sustainable educational transformation in postgraduate Islamic education.

## LITERATURE REVIEW

The evolution of digital assessment has transformed educational evaluation from conventional paper-based testing into technology-enhanced systems capable of measuring learning continuously and authentically. Contemporary digital assessment incorporates online platforms, adaptive testing, e-portfolios, automated feedback, and artificial intelligence to improve the efficiency and accuracy of evaluation. Recent

developments in Artificial Intelligence in Education (AIED) further enable intelligent assessment through automated scoring, personalized feedback, predictive analytics, and adaptive learning pathways. These innovations support competency-based education by providing continuous evidence of student learning rather than relying solely on summative examinations. Nevertheless, scholars have emphasized that AI-driven assessment should be implemented transparently, fairly, and ethically to avoid algorithmic bias, excessive automation, and the marginalization of human judgment (Zainal & Sofa, 2026).

The emergence of informatics competencies has become an essential dimension of higher education in the digital era. International educational frameworks define informatics competencies as encompassing computational thinking, programming, data literacy, artificial intelligence literacy, cybersecurity awareness, digital problem-solving, and responsible technology use. These competencies are increasingly recognized as fundamental graduate attributes because they prepare learners to navigate complex digital environments and participate effectively in knowledge-based societies. Within postgraduate Islamic education, however, informatics competencies should not be viewed merely as technical capabilities. They should also incorporate ethical decision-making, digital responsibility, collaboration, and critical reflection so that technological expertise is guided by moral values and contributes to the common good rather than technological efficiency alone (Islam et al., 2026).

Another important development is the application of learning analytics, which utilizes educational data to understand learning behavior, monitor academic progress, and improve instructional decision-making. Learning analytics enables educators to identify students' strengths, predict learning difficulties, and design timely interventions based on evidence derived from digital learning environments. Although learning analytics enhances assessment quality through data-driven insights, its implementation also raises significant ethical concerns related to data privacy, informed consent, transparency, algorithmic accountability, and the responsible management of educational information. These challenges have encouraged researchers to advocate for human-centered learning analytics, where technological innovation remains under the guidance of educational values, human judgment, and learner well-being rather than being driven solely by data optimization (Putri & Sofa, 2026).

From the perspective of Islamic educational philosophy, assessment extends beyond measuring academic achievement to encompass the holistic development of learners' intellectual, ethical, spiritual, and social dimensions. Islamic education seeks to cultivate individuals who embody *amanah* (trustworthiness), *'adl* (justice), *ihsan* (excellence), *taqwa* (God-consciousness), and *maslahah* (public benefit). Consequently, assessment should evaluate not only knowledge and technical competence but also character formation, ethical behavior, reflective thinking, and social responsibility. Despite growing scholarship on digital assessment, artificial intelligence, and Islamic education, relatively few studies have proposed an integrated framework that combines AI-driven assessment, informatics competencies, learning analytics, and ethical-spiritual values within a human-centered educational paradigm (Abd Salam et al., 2026). This study addresses that gap by developing an AI-Driven Ethical-Spiritual Assessment Framework that positions technology as a means of supporting holistic learning while ensuring that assessment remains aligned with the ethical and spiritual objectives of postgraduate Islamic education.

## RESEARCH METHODS

This study employed a qualitative library research design to develop an AI-Driven Ethical-Spiritual Assessment Framework integrating informatics competencies, learning analytics, and human-centered Islamic education. A library research approach was considered appropriate because the study aimed to construct a conceptual framework through a systematic synthesis of existing theories and empirical findings rather than collecting field-based data. The research critically examined scholarly discourse on digital assessment, Artificial Intelligence in Education (AIED), learning analytics, informatics education, authentic assessment, and Islamic educational philosophy to formulate a comprehensive assessment model for postgraduate Islamic education (Hasanah & Sofa, 2026).

The data sources comprised primary and secondary literature. Primary sources included seminal publications on educational assessment, artificial intelligence, learning analytics, informatics competencies, and Islamic educational thought. Secondary sources consisted of peer-reviewed journal articles, academic books, conference proceedings, policy documents, and international frameworks related to competency-based education, digital ethics, human-centered learning, and higher education assessment. Recent publications from internationally indexed journals were prioritized to ensure that the proposed framework reflects current developments in educational technology while maintaining consistency with the philosophical foundations of Islamic education.

The collected data were analyzed using qualitative content analysis following the interactive model of Miles, Huberman, and Saldaña, encompassing data condensation, data display, and conclusion drawing/verification (Wulandari & Sofa, 2026). The analysis focused on identifying recurring themes, conceptual relationships, and theoretical principles concerning AI-driven assessment, ethical-spiritual values, informatics competencies, and learning analytics. To enhance the credibility of the conceptual synthesis, source triangulation was conducted by comparing evidence from educational technology literature, Islamic educational philosophy, assessment theory, and informatics education. The outcome of this analytical process was the formulation of an integrated conceptual framework that aligns technological innovation with ethical, spiritual, and human-centered principles for postgraduate Islamic education.

## RESULTS AND DISCUSSION

The literature analysis indicates that the rapid advancement of **Artificial Intelligence (AI)** has fundamentally transformed educational assessment from a conventional measurement process into an intelligent, adaptive, and data-driven system. AI-driven assessment enables automated scoring, personalized feedback, predictive analytics, and continuous monitoring of students' learning progress through digital platforms. These capabilities improve assessment efficiency and provide lecturers with comprehensive evidence of students' academic performance. However, the review also reveals that many AI-based assessment systems primarily emphasize cognitive achievement and technical performance while paying insufficient attention to ethical responsibility, spiritual development, and human values. This imbalance suggests that technological innovation alone is insufficient to achieve the holistic educational objectives of postgraduate Islamic education, which seeks to cultivate intellectual excellence alongside moral integrity and spiritual maturity (Harifah & Sofa, 2025).

The findings further demonstrate that **informatics competencies** have become an essential component of postgraduate education in the digital era. Contemporary frameworks consistently identify computational thinking, data literacy, artificial intelligence literacy, programming, cybersecurity awareness, and digital problem-solving as fundamental competencies required for graduates. Nevertheless, within the context of Islamic higher education, these competencies should not be limited to technical proficiency. Instead, they should be integrated with Islamic ethical principles such as *amanah* (trustworthiness), *'adl* (justice), *ihsan* (excellence), *maslahah* (public benefit), and accountability. Such integration enables students to develop responsible digital behavior, critically evaluate AI-generated information, protect data privacy, and utilize technology for educational and societal benefit. Therefore, informatics competencies become both technical and ethical capacities that support sustainable digital transformation.

The synthesis of the literature also highlights the strategic role of **learning analytics** in supporting evidence-based assessment. Learning analytics facilitates the collection and analysis of learner-generated data to identify learning patterns, predict academic performance, and provide timely interventions. These capabilities contribute to personalized learning and more accurate assessment of students' competencies. However, the widespread implementation of learning analytics raises important concerns regarding data privacy, algorithmic transparency, informed consent, fairness, and the ethical governance of educational data. From the perspective of Islamic educational philosophy, technological decision-making should remain guided by human judgment and ethical responsibility rather than relying exclusively on algorithmic recommendations. Accordingly, this study argues that learning analytics should function as a decision-support mechanism that complements, rather than replaces, lecturers' professional expertise and moral considerations.

Based on the integration of assessment theory, artificial intelligence, informatics education, learning analytics, and Islamic educational philosophy, this study proposes an AI-Driven Ethical-Spiritual Assessment Framework consisting of five interconnected dimensions. The first dimension is AI-Assisted Assessment, utilizing artificial intelligence to provide adaptive assessment, automated feedback, and continuous competency evaluation. The second dimension is Informatics Competencies, encompassing computational thinking, AI literacy, data literacy, digital ethics, cybersecurity awareness, and digital problem-solving. The third dimension is Learning Analytics, employing educational data to monitor learning progress, identify students' needs, and support evidence-based instructional decisions while ensuring transparency and privacy. The fourth dimension is Ethical-Spiritual Assessment, evaluating students' ethical behavior, academic integrity, reflective practice, social responsibility, and spiritual development in accordance with Islamic educational values. The fifth dimension is Human-Centered Learning, positioning lecturers as facilitators who integrate technological innovation with empathy, critical reflection, dialogue, and learner well-being. These five dimensions collectively establish a holistic assessment ecosystem that balances technological advancement with ethical and spiritual objectives.

The proposed framework represents a significant conceptual contribution to postgraduate Islamic education by extending conventional digital assessment into a multidimensional model that integrates technological, pedagogical, ethical, and spiritual perspectives. Unlike existing digital assessment models that primarily emphasize

efficiency and measurable academic outcomes, the proposed framework recognizes that postgraduate education should also foster integrity, wisdom, digital responsibility, lifelong learning, and human flourishing. The integration of AI, informatics competencies, learning analytics, and Islamic educational philosophy provides a comprehensive approach to competency assessment while preserving the central role of educators in interpreting learning evidence and guiding students' personal development. Consequently, the framework offers a sustainable direction for designing future assessment systems that are technologically innovative, ethically accountable, spiritually grounded, and genuinely human-centered within postgraduate Islamic education.

## CONCLUSION

This study concludes that the transformation of digital assessment in postgraduate Islamic education requires a paradigm that extends beyond technological efficiency toward holistic, ethical, and human-centered evaluation. The synthesis of the literature demonstrates that Artificial Intelligence (AI), learning analytics, and informatics competencies provide significant opportunities to improve the quality, accuracy, and personalization of assessment. However, these technological advancements should be guided by the ethical and spiritual principles of Islamic education to ensure that assessment measures not only cognitive achievement and digital competence but also integrity, responsibility, reflective thinking, and spiritual development. Accordingly, the proposed AI-Driven Ethical-Spiritual Assessment Framework integrates five interconnected dimensions AI-assisted assessment, informatics competencies, learning analytics, ethical-spiritual evaluation, and human-centered learning to establish a balanced model for postgraduate assessment.

The proposed framework contributes theoretically by bridging educational technology, informatics education, learning analytics, and Islamic educational philosophy into a unified assessment paradigm. Practically, it provides guidance for universities, curriculum developers, and lecturers in designing assessment systems that are technologically advanced while remaining ethically accountable and spiritually grounded. Future research is recommended to empirically validate the framework across postgraduate Islamic education programs, examine its effectiveness in enhancing students' digital and ethical competencies, and explore its implementation within AI-supported learning environments to promote sustainable, competency-based, and human-centered higher education.

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