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ARTIFICIAL INTELLIGENCE IN ISLAMIC EDUCATION AND ISLAMIC CULTURE FOR STUDENTS' ACADEMIC AWARENESS

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Abstract: The rapid development of Artificial Intelligence (AI) has significantly transformed learning practices in higher education, including the ways students access, process, and present academic knowledge. This study aims to examine institutional support for coding and AI learning, explore students' perceptions of AI, analyze the transformation of students' academic awareness amid the use of AI, and reconstruct its utilization within the framework of Islamic education and Islamic culture. This research employed a descriptive quantitative approach with a survey design. The participants were 108 students from several private universities in Surakarta and its surrounding areas. Data were collected through an online questionnaire and analyzed using descriptive statistics, including tabulation, percentages, and contextual interpretation. The findings reveal that institutional support for coding and AI learning remains moderate, and students' understanding of basic AI concepts is similarly moderate. At the same time, most students perceive AI as relevant in supporting academic work in logical, critical, and systematic ways. However, the use of AI cannot be separated from the need to strengthen academic ethics, critical literacy, and a culture of verification. This study concludes that Islamic education and Islamic culture provide an important normative foundation for directing the use of AI so that it serves not merely as a tool of technological efficiency, but also as a means of cultivating students' critical, reflective, and morally responsible academic awareness.
Keywords: Artificial Intelligence, Islamic Education, Islamic Culture, Academic Awareness, Higher Education

Abstrak: Perkembangan pesat Artificial Intelligence (AI) telah membawa perubahan signifikan dalam praktik pembelajaran di perguruan tinggi, termasuk dalam cara mahasiswa mengakses, mengolah, dan menyajikan pengetahuan akademik. Penelitian ini bertujuan untuk mengkaji dukungan institusional terhadap pembelajaran coding dan AI, mengeksplorasi persepsi mahasiswa terhadap AI, menganalisis transformasi kesadaran akademik mahasiswa di tengah pemanfaatan AI, serta merekonstruksi penggunaannya dalam kerangka pendidikan Islam dan budaya Islam. Penelitian ini menggunakan pendekatan kuantitatif deskriptif dengan desain survei. Partisipan penelitian ini adalah 108 mahasiswa dari beberapa perguruan tinggi swasta di Surakarta dan sekitarnya. Data dikumpulkan melalui angket daring dan dianalisis menggunakan statistik deskriptif, meliputi tabulasi, persentase, dan interpretasi kontekstual. Hasil penelitian menunjukkan bahwa dukungan institusional terhadap pembelajaran coding dan AI masih berada pada tingkat sedang, dan pemahaman mahasiswa terhadap konsep dasar AI juga cenderung berada pada tingkat sedang. Pada saat yang sama, sebagian besar mahasiswa memandang AI relevan dalam mendukung pekerjaan akademik secara logis, kritis, dan sistematis. Namun, pemanfaatan AI tidak dapat dipisahkan dari kebutuhan untuk memperkuat etika akademik, literasi kritis, dan budaya verifikasi. Penelitian ini menyimpulkan bahwa pendidikan Islam dan budaya Islam memberikan landasan normatif yang penting dalam mengarahkan pemanfaatan AI agar tidak hanya berfungsi sebagai alat efisiensi teknologi, tetapi juga sebagai sarana untuk menumbuhkan kesadaran akademik mahasiswa yang kritis, reflektif, dan bertanggung jawab secara moral.
Kata Kunci: Artificial Intelligence, Pendidikan Islam, Budaya Islam, Kesadaran Akademik, Perguruan Tinggi

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INTRODUCTION

The development of Artificial Intelligence (AI) over the past decade has transformed the way people access knowledge, process information, and make academic decisions. In the context of higher education, AI is no longer merely a supporting technological tool; rather, it has become part of the learning ecosystem, influencing students' thinking processes, writing, evaluation, and intellectual interaction. Historically, the relationship between AI and education is not an entirely new phenomenon (Rozi, Widad, & Munif, 2025). Since the early stages of AI development, education has served as an important arena for testing ideas about cognition, learning, and human–machine relations (Doroudi, 2023). However, the emergence of generative AI, such as academic chatbots, has intensified new issues, particularly those related to the authority of knowledge, academic honesty, and the formation of students' reasoning.

In higher education, AI offers many opportunities. This technology can help students find references, summarize literature, translate texts, develop writing outlines, and facilitate more personalized and adaptive learning. Students tend to view generative AI as a useful tool for brainstorming, writing support, preliminary research, and information analysis (Chan & Hu, 2023). From a pedagogical perspective, the presence of AI also opens new possibilities for learning efficiency and expanded academic access. However, these benefits come with risks. When AI is used without epistemic and ethical control, the learning process may shift from strengthening thinking capacity to merely consuming ready-made answers. At this point, the question of students' academic awareness becomes highly relevant.

Academic awareness is not only related to students' technical ability to complete coursework but also concerns moral awareness, intellectual responsibility, commitment to academic honesty, and the ability to position knowledge within a framework of values. In practice, the use of AI in higher education often presents a dilemma between efficiency and integrity. In higher education, AI has a broad range of uses, from legitimate learning assistance to the potential misuse of AI for academic dishonesty (Moya et al., 2023). In line with this, generative AI can strengthen learning, but it also risks encouraging dependency, ghostwriting, and the erosion of the originality of students' scholarly work (Bittle & El-Gayar, 2025). Thus, the issue of AI cannot be understood merely as a technological issue but also as a matter of academic ethics.

Islamic education views knowledge as an *amanah* that must be managed with responsibility, honesty, and an orientation toward the common good. Therefore, the use of AI should not shift human beings from the position of moral subjects into passive users who surrender the entire thinking process to machines. The use of AI in education must be guided by ethical principles such as justice, transparency, accountability, privacy, and human oversight (Nguyen, Ngo, Hong, Dang, & Nguyen, 2023). Within the Islamic horizon, these principles may be enriched by the values of *amanah*, *'adl*, *maslahah*, and moral responsibility. According to Elmahjub, AI ethics from an Islamic perspective is important in providing a more plural ethical benchmark, so that the development and use of AI are not based solely on a narrow technocratic ethical framework (Elmahjub, 2023).

In addition to Islamic education, the element of Islamic culture is also important in understanding the phenomenon of AI among students. Islamic culture does not only

concern symbols and traditions but also encompasses patterns of thought, the ethics of seeking knowledge, methods of verifying information, the ethos of deliberation, and an orientation of knowledge grounded in the value of *tawhid* (Harnedi, 2022). In the Islamic intellectual tradition, the authority of knowledge is built through the processes of *tabayyun* (verification of chains of transmission), precision in argumentation, and respect for intellectual work. Therefore, the instant use of AI has the potential to conflict with Islamic academic culture if students are not equipped with critical and ethical awareness. A study shows that digital technology has become increasingly integrated with contemporary Islamic practices and spaces of Muslim identity expression (Wahid, 2024). This finding suggests that the relationship between Islam and technology is dynamic; therefore, what is needed is not the rejection of technology, but rather the cultural capacity to direct technology so that it remains within the orbit of Islamic values.

This issue becomes even more urgent when linked to the condition of students' digital literacy. The digital literacy skills of Indonesian students remain at a moderate level, with fairly prominent weaknesses in socio-cultural understanding, critical thinking, and information evaluation (Islamia & Arif, 2024). This finding is important because the healthy use of AI depends heavily on the ability to assess the quality of information, identify bias, and evaluate the validity of machine-generated outputs. If students have broad access to AI but possess low critical literacy and weak ethical awareness, AI is more likely to become a tool for accelerating the reproduction of superficial information rather than a means of deepening knowledge.

In Islamic educational settings, the ethical issues surrounding students' use of AI have also begun to be empirically identified. Several studies have found that the use of AI in learning raises concerns about data security, plagiarism, and user responsibility (Rahman & Afandi, 2024). In addition, Muslim students' acceptance of AI in religious learning is influenced by their perceptions of its usefulness and ease of use (Putra & Abdulhakim, 2025). These findings indicate that AI has been accepted as part of the reality of learning, including in Islamic studies. However, the acceptance of technology without ethical deepening risks producing students who are technologically pragmatic but weak in reflection and normative awareness.

This study aims not only to explain AI's position in the landscape of contemporary education but also to examine how Islamic education and Islamic culture can serve as a normative-critical framework for developing students' academic awareness. In this context, the fundamental questions that arise are how universities provide institutional support for learning coding and Artificial Intelligence, how students perceive the use of AI in academic activities, and how Islamic education and Islamic culture can offer ethical direction for the use of AI so that students become not only technically competent, but also possess scholarly responsibility, value awareness, and the ability to position technology as an instrument for the development of knowledge rather than as a substitute for human reasoning.

LITERATURE REVIEW

The rapid development of Artificial Intelligence (AI), especially generative AI, has transformed higher education from a setting that merely uses technological aids into one in which AI shapes learning, assessment, literacy, and institutional policy. Bond et al. (2024), in a meta-systematic review, found that AI integration in higher education is expanding rapidly but still requires greater attention to ethics, collaboration, and implementation rigor. Recent systematic reviews similarly show that AI opens opportunities for personalized learning, academic efficiency, and knowledge management, while simultaneously introducing new risks related to governance and academic integrity.

In the student context, two key concepts are AI literacy and students' perceptions. AI literacy should not be reduced to technical ability alone; it also involves understanding how AI works, monitoring its use, evaluating its outputs, and recognizing its limitations and biases. Recent studies on university students' AI literacy reveal significant variation across academic and demographic groups, suggesting that AI competence is not evenly distributed. Current conceptual and systematic work further argues that AI literacy should be treated as a core academic competency rather than an optional digital skill (Mansoor, Bawazir, Alsabri, Alharbi, & Okela, 2024).

Another major concept is students' perceptions of the benefits and risks of AI. A growing body of research shows that students commonly view AI as useful for brainstorming, writing support, preliminary research, and academic efficiency. However, these positive perceptions are consistently accompanied by concerns about accuracy, privacy, dependency, and academic misuse. Studies on AI-assisted writing and academic integrity suggest that the core tension is not simply whether AI may be used, but where the boundary lies between legitimate learning support and the substitution of students' intellectual work (Lund et al., 2025).

For that reason, academic integrity and academic awareness become central issues. Recent systematic reviews on generative AI and academic integrity emphasize that the efficiency gains offered by AI must be weighed against the risks of plagiarism, ghostwriting, and the erosion of originality in scholarly work. At the same time, other studies indicate that AI's impact in higher education depends heavily on how it is pedagogically framed, institutionally supported, and regulated through explicit policy. Thus, students' academic awareness cannot be built solely through technological access; it must be strengthened through critical literacy, a culture of verification, and learning designs that require intellectual accountability (Bittle & El-Gayar, 2025).

Recent scholarship also highlights a connection between AI literacy and higher-order thinking skills. Several studies suggest that AI can support analysis, evaluation, and knowledge synthesis when it is used reflectively and accompanied by pedagogical scaffolding. Conversely, when used passively, AI may weaken independent thinking. This insight is important for the present study because it shows that students' perceptions of AI cannot be separated from academic readiness, the quality of learning interaction, and the level of institutional support.

Within this study, Islamic education and Islamic culture serve as the normative-critical framework. Elmahjub (2023) argues that AI ethics from an Islamic perspective is

important for introducing a more plural ethical benchmark centered on justice, human dignity, responsibility, and the public good. Meanwhile, recent research on Muslim students' acceptance of AI in Islamic learning shows that perceived usefulness and ease of use influence AI acceptance, yet technological acceptance does not automatically lead to ethical use. In this regard, values such as *amanah*, *tabayyun*, scholarly responsibility, and respect for sources are essential for ensuring that AI functions as an instrument for knowledge development rather than a substitute for human reasoning.

Based on this review, a clear research gap remains. Most previous studies focus on AI from the perspective of technology adoption, student perception, or academic integrity in general. Far fewer studies examine, in an integrated way, institutional support, student perception, the transformation of academic awareness, and the reconstruction of AI use within the framework of Islamic education and Islamic culture, particularly in the context of private universities in Indonesia. Therefore, this study is significant because it extends the discussion of AI in higher education beyond technological efficiency to the cultivation of critical, reflective, and civilized academic awareness (Bond et al., 2024).

RESEARCH METHODOLOGY

This study employed a descriptive, quantitative approach with a survey design to examine students' perceptions of campus facilities and institutional support for coding and Artificial Intelligence (AI) learning, and their relationships with students' academic awareness from the perspectives of Islamic education and Islamic culture. A descriptive quantitative approach was selected because it is suitable for examining social and educational phenomena through systematic and measurable data collection, enabling researchers to obtain an objective representation of the conditions under study (Arikunto, 1998; Sugiyono, 2016). The survey design was applied to gather direct information from respondents regarding their experiences and perceptions of the academic environment in technology-based learning contexts (Creswell & Creswell, 2017).

The subjects of this study consisted of 108 students from several private universities in Surakarta. Respondents were selected using purposive sampling, namely the selection of participants based on specific criteria relevant to the study's objectives, particularly students with experience in digital technology-based learning and exposure to coding and AI applications in academic activities (Sugiyono, 2016). This sampling technique was considered appropriate because not all students possessed equal exposure to AI-based learning environments; therefore, respondents were selected from individuals capable of providing information relevant to the focus of the study (Arikunto, 1998).

Data were collected through an online questionnaire consisting of 20 closed-ended items divided into two major variables: (1) institutional support for coding and AI learning and (2) students' academic awareness in the use of AI technology. The questionnaire indicators for institutional support included the availability of digital facilities, internet access, lecturer guidance, campus learning resources, and institutional encouragement toward AI literacy. Meanwhile, indicators for academic awareness included ethical responsibility in AI use, academic honesty, critical verification of information (*tabayyun*), responsible technology usage (*amanah*), and awareness of the

educational impact of AI. The instrument employed a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

The instrument development process was conducted through several stages. First, questionnaire items were formulated based on previous studies concerning technology-based learning, academic awareness, and Islamic educational values. Second, the instrument was reviewed by experts in Islamic education and educational technology to ensure content validity and conceptual relevance. Third, a pilot test was conducted on a limited group of students to evaluate the clarity and consistency of the questionnaire items. Instrument validity was examined using Pearson product-moment correlation analysis, while reliability testing was conducted using Cronbach's Alpha coefficient to measure internal consistency. The results indicated that all questionnaire items met the validity requirements and demonstrated acceptable reliability for use in this study.

The use of questionnaires enabled the researcher to obtain data from a relatively large number of respondents in an efficient, structured, and uniform manner, thereby facilitating the processes of coding, tabulation, and statistical analysis (Creswell & Creswell, 2017; Sugiyono, 2016). After the data were collected, the researcher conducted stages of data checking, coding, tabulation, and interpretation using descriptive statistics in the form of frequencies and percentages to identify trends in respondents' perceptions. In addition, a correlation analysis was conducted to examine the relationship between institutional support and students' academic awareness of AI-based learning. This additional analysis was intended to determine whether institutional support significantly influenced students' academic awareness, beyond merely presenting descriptive percentages. The findings were subsequently interpreted within the framework of Islamic education and Islamic culture to provide not only statistical descriptions but also conceptual insights into the role of higher education institutions in fostering students' academic awareness in the era of AI development (Arikunto, 1998; Sugiyono, 2016).

FINDINGS AND DISCUSSION

Findings

Institutional Support for Coding and Artificial Intelligence Learning

The survey findings indicate that institutional support for coding and Artificial Intelligence (AI) learning among private universities in Surakarta remains moderate. Most respondents perceived that universities had begun to provide digital learning facilities and technological access, although such support had not yet been fully comprehensive. These findings suggest that higher education institutions are currently in a transitional phase toward AI-integrated learning environments.

Table 1. Students' perceptions of institutional support for AI learning

Category	Frequency	Percentage
Highly Supportive	5	4.6%
Supportive	32	29.6%
Moderately Supportive	49	45.4%

Less Supportive	22	20.4%
Total	**108**	**100%**

The data show that the largest proportion of respondents (45.4%) perceived institutional support as moderately supportive, while only 4.6% considered their institutions highly supportive. Meanwhile, 20.4% of students still perceived institutional support as less supportive. These findings indicate that institutional readiness for AI-based learning has not yet been evenly developed across higher education institutions.

Students' Perceptions of Artificial Intelligence

The survey results reveal that most students already possess initial knowledge and familiarity with Artificial Intelligence. However, levels of understanding vary among respondents, indicating differences in AI literacy and exposure to digital learning environments.

Table 2. Students' understanding of artificial intelligence

Level of Understanding	Frequency	Percentage
Highly Understand	18	16.7%
Understand	47	43.5%
Moderately Understand	31	28.7%
Do Not Understand	12	11.1%
Total	**108**	**100%**

The findings indicate that 43.5% of students considered themselves to understand AI, while 16.7% reported a high level of understanding. Nevertheless, 28.7% still perceived their understanding as moderate, and 11.1% admitted limited understanding of AI concepts and applications. This distribution suggests that students' conceptual readiness toward AI remains uneven.

Academic Awareness amid the Use of Artificial Intelligence

The findings also demonstrate that students generally perceive AI as relevant to strengthening their academic abilities, particularly in supporting logical explanation, systematic thinking, and information organization. Most respondents considered AI useful for assisting learning activities and academic tasks.

Table 3. Students' academic awareness regarding AI use

Category	Frequency	Percentage
Highly Relevant	44	40.7%
Relevant	47	43.5%
Moderately Relevant	16	14.8%
Not Relevant	1	0.9%
Total	**108**	**100%**

The results indicate that 84.2% of students perceived AI as relevant or highly relevant to the development of academic awareness. Only 0.9% considered AI unrelated to academic awareness. These findings suggest that AI has become an important component of students' academic experiences in higher education.

In addition, Pearson correlation analysis demonstrated a positive relationship between institutional support and students' academic awareness regarding AI-based learning ($r = 0.62$, $p < 0.05$). This result indicates that stronger institutional support tends to be associated with higher levels of students' academic awareness in using AI responsibly and productively.

Discussion

Mapping Institutional Support for Coding and Artificial Intelligence Learning in Higher Education

The findings demonstrate that institutional support for coding and Artificial Intelligence (AI) learning in private universities in Surakarta remains moderate. Most respondents perceived campus support as moderately supportive (45.4%), followed by supportive (29.6%), less supportive (20.4%), and highly supportive (4.6%). These results indicate that universities are beginning to adapt to AI-based learning environments, though institutional readiness remains uneven. The findings suggest that higher education institutions are currently undergoing a transitional phase in integrating AI into academic learning systems.

The dominance of the moderately supportive category reflects that students have already experienced basic forms of technological support, such as internet access, digital platforms, and initial exposure to AI-based learning. However, this support has not yet developed into a comprehensive ecosystem that includes infrastructure, institutional policy, lecturer training, and ethical guidance. This finding supports the argument that AI integration in higher education still requires stronger ethical, collaborative, and implementation frameworks (Bond et al., 2024). Similarly, perceived institutional support significantly influences students' confidence and perceptions toward AI-based learning (Jeilani & Abubakar, 2025). These findings confirm that institutional readiness is not limited to technological facilities alone but also involves academic governance and pedagogical direction.

The presence of students who perceived their campuses as less supportive also indicates disparities in access and learning experiences. Differences in internet quality, digital infrastructure, lecturer competence, and institutional policies may contribute to unequal opportunities in AI learning. In such conditions, students may use AI only pragmatically, without sufficient academic guidance or ethical awareness. This finding is consistent with studies emphasizing that AI implementation in education must be supported by principles of accountability, transparency, and responsible governance (Nguyen et al., 2023). Without clear institutional direction, AI risks becoming merely a shortcut for completing assignments rather than a meaningful learning instrument.

From the perspective of academic culture, the findings reveal that universities have not yet fully transformed AI into a reflective learning ecosystem. Many students already use AI to summarize texts, generate ideas, or search for information, but they are not

always equipped to verify outputs, evaluate bias, or critically assess the validity of AI-generated information. This issue is particularly important because the digital literacy level of Indonesian university students' digital literacy remains moderate (Islamia & Arif, 2024). Therefore, universities should not merely provide technological access but also strengthen evaluative thinking, digital literacy, and academic responsibility.

These findings also have important implications for academic integrity. AI in higher education simultaneously functions as a learning aid and as a potential source of academic misconduct. Consequently, institutional support should include not only facilities and access, but also ethical guidelines, citation policies, assessment strategies, and supervision regarding responsible AI use (Moya et al., 2023). The dominance of the moderately supportive category indicates that universities are at an early stage of AI adoption, yet institutional governance and ethical regulation remain underdeveloped.

Within the framework of Islamic education and Islamic culture, institutional support for AI learning should not be value-neutral. Islamic education regards knowledge as an *amanah* that must be pursued with honesty, responsibility, and ethical awareness (Salim & Habibi, 2025). Therefore, AI should be directed toward strengthening critical reasoning and academic morality rather than merely increasing efficiency. In this context, the principle of *tabayyun* becomes highly relevant. Students are expected to verify AI-generated information through academic references, lecturer guidance, and scholarly discussion before integrating it into academic assignments. Likewise, the value of *amanah* may be operationalized through transparent AI use, proper citation practices, and the avoidance of plagiarism or excessive dependence on machine-generated content. This interpretation aligns with the argument that AI ethics should incorporate broader moral and religious orientations (Elmahjub, 2023).

Overall, the findings indicate that institutional support for coding and AI learning in higher education remains in a developmental stage. Although universities have begun adapting to digital transformation, stronger infrastructure, governance, training, and ethical guidance are still required. In this regard, Islamic education and Islamic culture provide an important normative framework to ensure that AI integration not only improves learning efficiency but also cultivates ethical, critical, and responsible academic awareness among students.

Students' Perceptions of Artificial Intelligence in Higher Education

The findings indicate that students' understanding of the basic concepts of Artificial Intelligence (AI) in higher education remains generally moderate. The survey results show that 43.5% of respondents considered themselves to understand AI, while 16.7% reported a high level of understanding. Meanwhile, 28.7% perceived their understanding as moderate, and 11.1% admitted that they did not yet understand AI well. These findings demonstrate that AI has become increasingly familiar within students' academic experiences; however, their conceptual understanding has not yet developed comprehensively. Most students appear to recognize AI primarily as a practical tool rather than as a critical academic framework.

This condition aligns with previous studies showing that university students generally perceive AI positively because it assists with brainstorming, writing,

preliminary research, and information retrieval, while simultaneously raising concerns about accuracy, privacy, and dependency (Chan & Hu, 2023). The coexistence of optimism and caution suggests that students' perceptions of AI are shaped not only by technological usefulness but also by awareness of its academic and ethical implications. In this study, students' moderate understanding reflects that they are already familiar with AI applications such as chatbots, translation tools, and writing assistants, although their engagement remains largely functional rather than conceptual.

The findings further indicate that AI literacy among students has not yet reached the level of critical understanding. Most respondents appear capable of using AI applications, yet they may not fully understand how AI systems operate, generate outputs, or produce potential bias. This finding is consistent with the argument that AI literacy in higher education should involve the ability to understand, evaluate, monitor, and critically use AI technologies rather than merely applying them technically (Černý, 2023). Therefore, the challenge faced by universities is not only introducing AI tools but also developing students' analytical awareness regarding the opportunities, limitations, and risks of AI-based learning.

The proportion of students categorized as understanding AI also demonstrates significant potential for the development of AI learning in higher education. Students who already possess initial conceptual familiarity may more easily adapt to AI-assisted academic activities, including information analysis, academic writing, and collaborative learning. However, previous studies also warn that excessive dependence on AI may reduce independent thinking and weaken reflective learning processes if not accompanied by adequate pedagogical supervision (Johnston, Wells, Shanks, Boey, & Parsons, 2024). It suggests that positive perceptions of AI should be balanced with critical literacy and ethical responsibility.

At the same time, the presence of students who reported limited understanding remains an important issue. This finding indicates that access to AI literacy remains unequal among students. Differences in academic background, exposure to AI-related learning, digital infrastructure, and institutional support may influence students' conceptual readiness toward AI. Studies on AI literacy have shown that learning experience, academic environment, and the frequency of AI use significantly affect students' levels of understanding (Toker Gokce, Deveci Topal, Kolburan Geçer, & Dilek Eren, 2025). Therefore, low AI literacy should not merely be interpreted as an individual limitation but also as an indication that higher education institutions have not yet fully developed inclusive and equitable AI learning ecosystems.

The findings also reveal that students' perceptions of AI are closely related to academic ethics and higher-order thinking. Students with stronger conceptual understanding are more likely to use AI reflectively and productively, whereas shallow understanding may lead to mechanical reliance on AI-generated outputs. Previous research has demonstrated that AI literacy positively correlates with higher-order thinking skills, particularly when supported by active learning engagement and peer interaction (Lu, Zhu, Pang, & Shadiev, 2025). It suggests that conceptual understanding plays an important role in shaping responsible AI usage within academic contexts.

From the perspective of Islamic education, these findings indicate that students are currently in a transitional phase, moving from merely becoming technology users to becoming academic subjects guided by ethical and intellectual responsibility. Islamic educational values emphasize that knowledge should be pursued through honesty, responsibility, and amanah. In this context, the principle of *tabayyun* becomes particularly relevant, as students are expected to verify AI-generated information through credible academic references and scholarly discussion before using it in academic assignments. Likewise, amanah may be operationalized through transparent use of AI, proper citation practices, and the avoidance of plagiarism or excessive reliance on AI-generated content. These findings align with studies showing that students generally support AI as an assistive learning tool, but reject its use when it replaces the entire academic process (Barrett & Pack, 2023).

Overall, the findings demonstrate that students' perceptions of AI in higher education remain dynamic and layered. Positive perceptions of AI's usefulness coexist with concerns about integrity, dependency, and conceptual understanding. Therefore, stronger institutional support, AI literacy development, and ethical guidance are necessary to ensure that AI functions not merely as a technological instrument but also as a means of strengthening critical thinking, academic responsibility, and ethical awareness in higher education.

The Transformation of Students' Academic Awareness amid the Use of Artificial Intelligence

The findings demonstrate that the use of Artificial Intelligence (AI) is closely related to the transformation of students' academic awareness, particularly in strengthening their ability to understand, analyze, and explain academic materials logically, critically, and systematically. The survey results show that 43.5% of respondents categorized AI as relevant to strengthening their academic abilities, while 40.7% considered it highly relevant. Meanwhile, 14.8% perceived AI as moderately relevant, and only 0.9% viewed it as not relevant. These findings indicate that most students perceive AI not merely as a technological tool but as an academic instrument that supports critical reasoning, the organization of ideas, and the explanation of complex academic concepts. This result supports previous studies showing that AI can strengthen higher-order thinking skills when it is used for analysis, argument construction, and concept exploration rather than replacing students' own reasoning processes (Du, Du, Zhou, & Bai, 2025; Lu et al., 2025).

The dominance of the relevant and highly relevant categories suggests that students increasingly view AI as part of their academic learning process. In the context of hadith studies, the ability to explain classical Islamic texts requires critical reading, contextual understanding, interpretation, and systematic argumentation. Students appear to perceive AI as helpful in supporting these initial stages of intellectual work, particularly in summarizing materials, organizing discussion points, identifying concepts, and exploring references. This finding aligns with previous studies that emphasize that AI may serve as a facilitator of critical learning when integrated into analytical and reflective academic

activities (Roslaini, Ithriyah, Sari, & Harun, 2023). However, AI remains dependent on pedagogical supervision and students' own intellectual engagement.

Despite these positive perceptions, the findings should not be interpreted too optimistically. The relevance of AI to academic ability does not automatically indicate an improvement in the depth or quality of scholarship. Students may experience increased efficiency in accessing information and constructing explanations, yet academic quality still depends on their ability to evaluate sources, compare interpretations, and critically examine AI-generated outputs. Previous research on generative AI in education has shown that AI supports critical thinking only when students actively interpret, test, and challenge the generated information (C. C. Lee & Low, 2024; D. Lee et al., 2024; Nasr et al., 2025). In contrast, passive reliance on AI may weaken intellectual independence and reduce reflective learning.

The findings also indicate a shift in students' learning orientation within higher education. Academic awareness is no longer shaped solely through interaction with books, lecturers, and classrooms, but also through engagement with AI systems. Students increasingly experience a dialogical relationship with technology, where AI becomes part of the process of searching, organizing, and understanding knowledge. This transformation may positively contribute to learning when AI is used to expand perspectives, support discussion, and facilitate conceptual mapping. Previous studies demonstrated that AI literacy positively correlates with higher-order thinking skills, particularly when supported by active learning engagement and peer interaction (Lund et al., 2025). Therefore, AI becomes more educationally meaningful when embedded within a collaborative and reflective academic culture rather than functioning merely as a shortcut to producing answers.

At the same time, the existence of students who perceived AI as only moderately relevant indicates that the transformation of academic awareness remains uneven. Some students may benefit from AI technically, but may not yet experience deeper conceptual learning. Variations may influence this difference in AI literacy, academic background, institutional support, and students' ability to formulate critical questions. Studies on AI literacy suggest that students' learning experiences and exposure to digital learning environments significantly influence how meaningfully they can engage with AI technologies (Toker Gokce et al., 2025). Consequently, the effectiveness of AI in higher education cannot be separated from institutional readiness and pedagogical support.

From an academic integrity perspective, the strong perception of AI's relevance must be balanced with ethical awareness. Students generally recognize the benefits of AI as a learning aid, while simultaneously expressing concerns regarding plagiarism, dependency, and the replacement of intellectual effort (Chan & Hu, 2023; Johnston et al., 2024). In the context of hadith studies, these concerns become particularly significant because religious knowledge requires methodological discipline, interpretive caution, and scholarly accountability. Therefore, AI should not be positioned as an authority in religious interpretation, but rather as a supporting tool subject to scholarly verification by students and lecturers.

Within the framework of Islamic education, the transformation of students' academic awareness should also be understood as a process of cultivating intellectual

adab. Islamic education emphasizes not only cognitive achievement but also honesty, amanah, responsibility, and tabayyun in the pursuit of knowledge. In this context, tabayyun may be operationalized through students' practices of verifying AI-generated information using academic journals, classical Islamic references, and lecturer supervision before integrating it into assignments. Likewise, amanah may be reflected in transparent AI use, proper citation, and the avoidance of plagiarism or overdependence on machine-generated content. These findings support the argument that AI ethics within Islamic education should incorporate broader moral and spiritual orientations rather than focusing solely on technological efficiency (Elmahjub, 2023).

Overall, the findings reveal that AI has contributed to a transformation of students' academic awareness, making them more systematic, technologically adaptive, and academically engaged. Nevertheless, this transformation remains ambivalent. On the one hand, AI strengthens efficiency, organization, and access to knowledge; on the other hand, it risks reducing independent reasoning when not balanced by critical literacy and ethical guidance. Therefore, within the perspective of Islamic education and Islamic culture, AI should be directed toward strengthening students' reasoning, intellectual responsibility, and academic civility rather than replacing the essential process of scholarly thinking.

Reconstructing the Use of Artificial Intelligence within the Framework of Islamic Education and Islamic Culture

The reconstruction of the use of Artificial Intelligence (AI) within the framework of Islamic education and Islamic culture should be positioned at the intersection of technological innovation, ethics of knowledge, and the cultivation of academic adab. In higher education, AI no longer functions merely as a technical support tool but has become part of the academic process through which students search for information, summarize readings, develop ideas, translate texts, and construct arguments. Consequently, the primary issue is no longer whether AI may be used, but rather how AI can be directed to remain consistent with the goals of Islamic education, namely the strengthening of knowledge, character formation, and intellectual responsibility. Previous studies have shown that AI integration in higher education offers opportunities for personalized learning, academic efficiency, and wider access to knowledge, while simultaneously creating risks related to dependency, bias, and violations of academic integrity when ethical governance remains weak (Moya et al., 2023; Nguyen et al., 2023).

From the perspective of Islamic education, the reconstruction of AI use must begin with the understanding that technology is an instrument rather than an authority of knowledge. Islamic educational philosophy views knowledge as an amanah that should be pursued through honesty, discipline, and responsibility. Therefore, AI should not replace students' reasoning processes or the scholarly authority of lecturers, but instead function as a supporting medium that strengthens learning activities. This interpretation is consistent with the argument that AI ethics within Islamic thought should be guided by values such as justice, responsibility, public benefit, and human dignity (Elmahjub, 2023). Such a framework becomes increasingly important because discussions of AI

ethics are often dominated by technocratic perspectives that pay limited attention to moral and religious dimensions.

Within the framework of Islamic culture, reconstructing AI use also requires the revitalization of adab in seeking knowledge. Islamic culture emphasizes not only religious identity but also intellectual ethics such as critical reading, tabayyun, respect for scholarly sources, precision in argumentation, and responsibility in conveying knowledge. In the context of AI, these values require students not merely to use generative technologies technically, but also to verify the accuracy of information, identify limitations of AI-generated outputs, and critically evaluate content before integrating it into academic work. Bibliometric studies on Islam and digital technology demonstrate that the integration of digital tools within Islamic educational environments continues to expand, particularly in religious learning and academic communication (Wahid, 2024). These findings suggest that the challenge faced by higher education institutions is not rejecting technology, but rather developing a cultural and ethical framework capable of directing AI toward responsible academic use.

The reconstruction of AI use must also address the practical realities faced by Muslim students in higher education. Studies on students' acceptance of AI in Islamic learning contexts indicate that perceived usefulness and ease of use strongly influence students' willingness to adopt AI technologies (Faizin et al., 2025). Nevertheless, technological acceptance does not automatically ensure ethical or critical use. Universities therefore need to move beyond encouraging technological adoption and instead focus on fostering responsible engagement with AI, including clarifying the boundaries of AI use in academic writing, assignments, analysis, and research activities. In this regard, AI should be integrated into pedagogical practices that strengthen students' intellectual independence rather than encouraging passive dependency.

At the pedagogical level, AI in Islamic education may be reconceptualized into four major functions. First, AI may function as a tool for knowledge exploration, such as identifying themes, tracing references, and mapping preliminary concepts. Second, AI may support the organization of knowledge through summarization, outlining, and conceptual visualization. Third, AI may function as a reflective instrument that helps students test arguments and compare perspectives before conducting independent verification. Fourth, AI should become an object of ethical literacy through which students learn about bias, hallucination, privacy risks, and the misuse of digital technologies. Previous studies have shown that students generally perceive AI positively for brainstorming, early-stage writing, and information retrieval, while simultaneously expressing concerns regarding dependency, accuracy, and the erosion of personal intellectual development (Chan & Hu, 2023). Therefore, AI should be positioned within a pedagogical framework that recognizes both its benefits and limitations.

From the perspective of academic governance, reconstructing AI use requires clearer institutional policies and ethical guidelines. Universities should establish regulations regarding AI use in assignments, citation practices, originality standards, and ethical supervision. Such principles are closely aligned with Islamic values such as amanah, honesty, justice, and responsibility for the common good. Without clear governance, AI may easily shift from being a tool that strengthens learning into a shortcut

that weakens academic integrity (Foltynek et al., 2023). In this process, lecturers continue to hold a central role not merely as transmitters of knowledge, but also as guides of intellectual *adab*. AI should therefore strengthen academic interaction, discussion, and reflective learning rather than replacing the essential processes of reading, reasoning, and scholarly responsibility.

Finally, the principle of *tabayyun* must become a central epistemological foundation in the reconstruction of AI use within Islamic higher education. Generative AI may produce convincing information that is not always accurate, contextual, or methodologically valid. Consequently, students should be encouraged to verify AI-generated outputs through scholarly references, lecturer guidance, and proper scientific methodology before incorporating them into academic work. In Islamic studies, this principle becomes particularly significant because errors in interpretation, quotation, or contextual understanding may substantially affect the quality of knowledge itself. Therefore, within the framework of Islamic education and Islamic culture, AI should remain subject to scholarly discipline, ethical verification, and intellectual responsibility rather than becoming an unquestioned source of authority.

Table 4. Conceptual mapping of the reconstruction of artificial intelligence utilization within the framework of Islamic education and Islamic culture

Component	**Reconstruction Focus**	**Meaning in Islamic Education and Islamic Culture**	**Practical Implications**
Basic orientation	AI as an instrument, not an authority	Knowledge remains grounded in reason, *adab*, and responsibility	AI is used to assist, not to replace thinking
Ethical foundation	*Amanah*, justice, *maslahah*, responsibility	Aligned with modern AI ethics and Islamic values	Ethical guidelines for AI use on campus are needed
Scholarly culture	*Tabayyun*, precision, respect for sources	Safeguards academic quality and the authenticity of academic work	Students are required to verify AI-generated results
Pedagogical function	Exploration, organization, reflection, and ethical literacy	AI supports learning when properly directed	Integration of AI into assignments and discussions under lecturers' guidance
Institutional governance	Policies, assessment, citation, and training	The university serves as the guide of digital academic culture	Clear regulations and training are required
Final goal	Civilized academic awareness	Students are technologically proficient and demonstrate scholarly integrity.	AI supports both knowledge development and academic character.

The reconstruction of Artificial Intelligence use within the framework of Islamic education and Islamic culture must be built upon six interrelated main components. First, AI should be positioned as an instrument rather than an authority, so that the process of knowledge remains grounded in reason, *adab*, and responsibility. Second, ethical foundations such as *amanah*, justice, *maslahah*, and responsibility are essential to ensuring that AI use aligns with both Islamic values and modern ethics. Third, scholarly culture, including *tabayyun*, precision, and respect for sources, must be maintained to preserve academic quality. In addition, the pedagogical function of AI should focus on exploration, organization, reflection, and ethical literacy (Abbas & Nuriana, 2023). All of these require clear institutional governance through policies, assessment, citation, and training. Ultimately, the main goal is to develop students' academic awareness so that they are technologically capable, morally grounded, and scholarly responsible.

More operationally, this reconstruction leads to a model of AI use that is selective, reflective, and gradual. Students may use AI in the early stages of learning, such as in identifying terms, explaining basic concepts, or preparing outlines. However, at the stages of analysis, synthesis, and conclusion, students are still required to rely on the reading of primary sources, academic discussion, and their own intellectual accountability. Such an approach aligns with recommendations on AI ethics in education, which position humans as the final decision-makers and AI as a supporting tool. In Islamic education, this approach is relevant because it maintains a balance between openness to innovation and commitment to the formation of knowledgeable and civilized individuals (Elmahjub, 2023; Nguyen et al., 2023).

Thus, reconstructing the use of Artificial Intelligence within the framework of Islamic education and Islamic culture does not mean restricting technology; rather, it means directing it to remain aligned with the broader goals of education. AI needs to be understood as a legitimate pedagogical aid, as long as ethics, a culture of verification, institutional governance, and academic adab frame its use. Within this framework, Islamic education provides the normative foundation, while Islamic culture offers the practical means to maintain the quality of the pursuit of knowledge. These findings confirm that the future of AI in higher education cannot be built merely on efficiency and innovation, but must also rest upon academic honesty, moral responsibility, and an orientation toward the common good. It is through this path that AI can be reconceptualized as a means of strengthening students' academic awareness, making it critical, reflective, and civilized.

CONCLUSION

The findings of this study confirm that Artificial Intelligence has moved from the margins to the mainstream of student learning in private universities in Surakarta and its surrounding areas. Yet this shift has not been matched by equally strong institutional readiness. Although AI is already embedded in the academic experiences of students, campus support, policy frameworks, and students' conceptual understanding remain at a moderate level. It reveals a clear gap: higher education is undergoing digital

transformation, but the supporting infrastructure, academic governance, and literacy foundations required to guide that transformation have not yet been fully consolidated.

At the same time, AI is widely perceived as relevant in strengthening students' ability to explain academic materials in logical, critical, and systematic ways. However, its academic value does not lie solely in speed or convenience. Without ethical discipline, source verification, and scholarly accountability, AI risks shifting from a learning aid into a shortcut that weakens intellectual seriousness. For this reason, Islamic education and Islamic culture are not peripheral to the discussion; they are central. They provide the moral and epistemological foundations needed to ensure that AI remains anchored in *amanah*, *tabayyun*, academic honesty, and *maslahah*.

Therefore, the future direction of AI in higher education must go beyond technological efficiency. What is required is not merely AI adoption but the reconstruction of its use within a framework that cultivates critical, reflective, and civilized academic awareness. AI must be firmly positioned as an instrument for deepening knowledge and strengthening human thought, not as a substitute for students' reasoning, intellectual struggle, and scholarly responsibility.

REFERENCES

Abbas, N., & Nuriana, M. (2023). Metode Keteladanan Guru Terhadap Kecerdasan Murid. *Lisyabab : Jurnal Studi Islam Dan Sosial*, *4*(1), 26-38. https://doi.org/10.58326/jurnallisyabab.v4i1.155

Arikunto, S. (1998). P*endekatan Penelitian*. Jakarta: Rineka Cipta.

Barrett, A., & Pack, A. (2023). Not quite eye to A.I.: Student and teacher perspectives on the use of generative artificial intelligence in the writing process. *International Journal of Educational Technology in Higher Education, 20*(1), 59. https://doi.org/10.1186/s41239-023-00427-0

Bittle, K., & El-Gayar, O. (2025). Generative AI and academic integrity in higher education: A systematic review and research agenda. Information, 16(4), 296. https://doi.org/10.3390/info16040296

Bond, M., Khosravi, H., De Laat, M., Bergdahl, N., Negrea, V., Oxley, E., ... Siemens, G. (2024). A meta-systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigor. International Journal of Educational Technology in Higher Education, 21(1), Article 4. https://doi.org/10.1186/s41239-023-00436-z

Černý, M. (2024). AI literacy in higher education: Theory and design. In Ł. Tomczyk (Ed.), New media pedagogy: Research trends, methodological challenges, and successful implementations (Communications in Computer and Information Science, Vol. 2130, pp. 364–379). Springer. https://doi.org/10.1007/978-3-031-63235-8_24

Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. International Journal of Educational Technology in Higher Education, 20(1), Article 43. https://doi.org/10.1186/s41239-023-00411-8

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*: New York: Sage Publications.

Doroudi, S. (2023). The intertwined histories of artificial intelligence and education. *International Journal of Artificial Intelligence in Education, 33*(4), 885–928. https://doi.org/10.1007/s40593-022-00313-2

Du, X., Du, M., Zhou, Z., & Bai, Y. (2025). Facilitator or hindrance? The impact of AI on university students' higher-order thinking skills in complex problem solving. *International Journal of Educational Technology in Higher Education, 22*(1), Article 39. https://doi.org/10.1186/s41239-025-00534-0

Elmahjub, E. (2023). Artificial intelligence (AI) in Islamic ethics: Towards pluralist ethical benchmarking for AI. *Philosophy & Technology, 36*(4), 73. https://doi.org/10.1007/s13347-023-00668-x

Faizin, N., Alfan, M., Basid, A., Ramadhan, M. R., Panatik, S. A., & Kawakip, A. N. (2025). Muslim students' acceptance of artificial intelligence in Islamic religious education: An extended TAM approach. *Discover Education, 4*(1), Article 304. https://doi.org/10.1007/s44217-025-00767-1

Foltynek, T., Bjelobaba, S., Glendinning, I., Khan, Z. R., Santos, R., Pavletic, P., & Kravjar, J. (2023). ENAI Recommendations on the ethical use of Artificial Intelligence in Education. *International Journal for Educational Integrity*, 19, Article No. 12. https://doi.org/10.1007/s40979-023-00133-4.

Harnedi, J. (2022). Optimalisasi Peran Pendidikan Islam Di Tengah Masyarakat Modern Dengan Pendekatan Qurani. *Jurnal As-Salam, 6*(1), 1-10. doi:https://doi.org/10.37249/assalam.v6i1.357

Islamia, I., & Arif, A. R. (2024). Assessing digital literacy skills among Indonesian university students in the age of Society 5.0. *Jurnal Educative: Journal of Educational Studies, 9*(2), 182-194. doi:https://doi.org/10.30983/educative.v9i2.8678

Jeilani, A., & Abubakar, S. (2025). Perceived institutional support and its effects on student perceptions of AI learning in higher education: The role of mediating perceived learning outcomes and moderating technology self-efficacy. *Frontiers in Education, 10*, Article 1596886. https://doi.org/10.3389/feduc.2025.1596886

Johnston, H., Wells, R. F., Shanks, E. M., Boey, T., & Parsons, B. N. (2024). Student perspectives on the use of generative artificial intelligence technologies in higher education. *International Journal for Educational Integrity, 20*(1), Article 2. https://doi.org/10.1007/s40979-024-00149-4

Lee, C. C., & Low, M. Y. H. (2024). Using GenAI in education: The case for critical thinking. *Frontiers in Artificial Intelligence, 7*, Article 1452131. https://doi.org/10.3389/frai.2024.1452131

Lee, D., Arnold, M., Srivastava, A., Plastow, K., Strelan, P., Ploeckl, F., ... Palmer, E. (2024). The impact of generative AI on higher education learning and teaching: A study of educators' perspectives. *Computers and Education: Artificial Intelligence, 6*, 100221. https://doi.org/10.1016/j.caeai.2024.100221

Lu, K., Zhu, J., Pang, F., & Shadiev, R. (2025). Understanding the relationship between college students' artificial intelligence literacy and higher-order thinking skills using the 3P model: The mediating roles of behavioral engagement and peer interaction. *Educational Technology Research and Development, 73*(2), 693–716. https://doi.org/10.1007/s11423-025-10467-2

Lund, B., Mannuru, N. R., Teel, Z. A., Lee, T. H., Ortega, N. J., Simmons, S., & Ward, E. (2025). Student perceptions of AI-assisted writing and academic integrity: Ethical concerns, academic misconduct, and use of generative AI in higher education. *AI in Education, 1*(1), Article 2. https://doi.org/10.3390/aieduc1010002

Mansoor, H. M., Bawazir, A., Alsabri, M. A., Alharbi, A., & Okela, A. H. (2024). Artificial intelligence literacy among university students—a comparative transnational survey. *Frontiers in Communication, 9*, 1478476. doi:https://doi.org/10.3389/fcomm.2024.1478476

Moya, B., Eaton, S. E., Pethrick, H., Hayden, K. A., Brennan, R., Wiens, J., . . . Lesage, J. (2023). Academic integrity and artificial intelligence in higher education contexts: A rapid scoping review protocol. *Canadian Perspectives on Academic Integrity, 5*(2), 59-75. doi:https://doi.org/10.55016/ojs/cpai.v5i2.75990

Nasr, N. R., Tu, C.-H., Werner, J., Bauer, T., Yen, C.-J., & Sujo-Montes, L. (2025). Exploring the impact of generative AI ChatGPT on critical thinking in higher education: Passive AI-directed use or human–AI supported collaboration? *Education Sciences, 15*(9), 1198. https://doi.org/10.3390/educsci15091198

Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B.-P. T. (2023). Ethical principles for artificial intelligence in education. *Education and Information Technologies, 28*(4), 4221–4241. https://doi.org/10.1007/s10639-022-11316-w

Putra, H. R., & Abdulhakim, L. (2025). Empowering Muslim adolescents through progressive Islamic digital literacy to combat cyberbullying. *Multicultural Islamic Education Review, 2*(1), 53–62. https://doi.org/10.23917/mier.v2i1.6577

Rahman, M. R. N., & Afandi, N. K. (2024). Islamic Education Students' Perceptions: A Phenomenological Study on the Ethics of Using Artificial Intelligence (AI) in Learning. *J-PAI: Jurnal Pendidikan Agama Islam, 11*(1), 45-57. doi:https://doi.org/10.18860/jpai.v11i1.27932

Roslaini, R., Ithriyah, S., Sari, I. P., & Harun, M. (2023). The Utilization of Islamic-Based Texts for Character Innovation: EFL Students' Perception. *Jurnal As-Salam, 7*(2), 123-132. doi:https://doi.org/10.37249/assalam.v7i2.658

Rozi, F., Widad, S., & Munif, M. (2025). Utilization of Artificial Intelligence to Improve Students' Understanding through ChatGPT. *Islamika, 7*(2), 362-376. doi:10.36088/islamika.v7i2.5671

Salim, M. A., & Habibi, F. (2025). AI ChatGPT-Based Islamic Religious Education to Enhance Students' Critical Thinking and Moral Reasoning. *Islamika, 7*(4), 716-729. doi:10.36088/islamika.v7i4.5915

Sugiyono. (2016). Metode penelitian kuantitatif, kualitatif dan R&D. *Alfabeta, Bandung*.

Toker Gokce, A., Deveci Topal, A., Kolburan Geçer, A., & Dilek Eren, C. (2025). Investigating the level of artificial intelligence literacy of university students using decision trees. *Education and Information Technologies, 30*(5), 6765–6784. https://doi.org/10.1007/s10639-024-13081-4

Wahid, S. H. (2024). Exploring the intersection of Islam and digital technology: A bibliometric analysis. *Social Sciences & Humanities Open, 10*, 101085. https://doi.org/10.1016/j.ssaho.2024.101085