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The Controversy Surrounding Artificial Intelligence Regulation in Higher Education in Indonesia

Abriadi Muhara[1]*, Hasmawaty[2], Sitti Nurhidayah Ilyas[3], Bonita Mahmud[4]
Makassar State University
Corresponding Author: Abriadi Muhara abriadi@unm.ac.id

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A B S T R A K

This study examines the controversy surrounding the regulation of Artificial Intelligence (AI) in Indonesian higher education and its implications for academic ethics and adaptive governance in the digital era. The research employs a qualitative approach through interviews, observations, and document analysis to explore the integration of AI in academic practices. The findings indicate three main issues: the increasing integration of AI and digital learning systems in teaching and learning processes, the growing number of research and innovation initiatives related to AI within universities, and the lack of clear national regulations governing AI usage in higher education. These findings highlight the need for adaptive governance frameworks and policy guidelines to ensure that AI technologies are utilized responsibly while maintaining academic integrity and supporting sustainable educational transformation.

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INTRODUCTION

The rapid development of artificial intelligence, particularly generative artificial intelligence (GenAI), has significantly transformed the landscape of higher education, especially in learning processes, research activities, and academic assessment (Cordero et al., 2025; Xia et al., 2024). Technologies such as large language models enable students and academics to generate academic texts, conduct literature analysis, and assist in scientific writing more efficiently (Alqahtani et al., 2023; Lund et al., 2023) This transformation creates substantial opportunities for innovation in teaching and academic productivity. However, the integration of such technologies also raises ethical dilemmas regarding academic authenticity, transparency in AI usage, and the boundaries between technological assistance and violations of academic integrity (Z. Chen et al., 2024; Gbadago et al., 2025). Studies indicate that generative AI presents both opportunities and risks related to academic honesty and the quality of higher education learning outcomes (Lund et al., 2023; Tlili et al., 2023).

At the same time, the emergence of AI technology in higher education has triggered controversies regarding regulation and institutional policies. Universities worldwide are currently attempting to formulate appropriate policies to regulate the use of AI in academic processes (Chan, 2023; Uslu & Bozkurt, 2026). Some institutions adopt an open approach by integrating AI into teaching and learning activities, while others impose strict restrictions due to concerns about plagiarism, data manipulation, and the potential decline in students' critical thinking skills (Deep & Chen, 2025; Evangelista, 2025). This situation demonstrates that AI regulation in higher education remains dynamic and lacks globally standardized governance frameworks.

In the Indonesian context, the development of AI technology has also begun to influence academic practices in universities (Helmiatin et al., 2024; Yusriadi et al., 2023). However, formal policies governing the use of AI in higher education remain limited and are not yet systematically integrated into institutional academic governance (Chan, 2023; George & Wooden, 2023). The absence of a comprehensive regulatory framework may lead to ambiguity in the implementation of academic ethics, particularly concerning the use of AI in scientific writing, academic assignments, and research activities (Amini et al., 2025; Carobene et al., 2024). This condition highlights a significant gap between the rapid advancement of digital technologies and the readiness of higher education governance systems to manage them effectively (Alenezi et al., 2023; Veseli et al., 2025).

Several previous studies have examined the impact of generative AI in higher education from various perspectives (Batista et al., 2024; Bencsik et al., 2026). For instance, systematic literature reviews show that AI usage may influence student behavior in learning processes and potentially create challenges for academic integrity, such as AI-assisted plagiarism and reduced originality in scholarly work (Lund & Wang, 2023; Rodrigues et al., 2025). Other studies emphasize the "dual nature" of AI technologies, which can enhance learning outcomes through personalized education while simultaneously

creating risks of misuse in academic contexts (Kasneci et al., 2023; Suleybanova et al., 2025).

Other research highlights the importance of developing institutional policies to regulate AI usage within universities (Chan, 2023; Da Mota, 2024). Comparative analyses of AI policies across global universities indicate that many higher education institutions are currently developing guidelines aimed at balancing technological innovation with the protection of academic integrity (Alsharefeen & Al Sayari, 2025; Gbadago et al., 2025). Nevertheless, many of these policies remain experimental and have not yet established stable governance models (Huitema et al., 2018; Laakso et al., 2017).

Although these studies contribute significantly to understanding the implications of AI in higher education, most research focuses on global contexts or developed countries (Abbasi et al., 2025; Al-Zahrani & Alasmari, 2024). Studies that specifically examine the controversy of AI regulation in Indonesian higher education, particularly in relation to the transformation of academic ethics and the development of adaptive governance models, remain limited (Capano et al., 2025; Mu'alimin, 2025). Therefore, the novelty of this research lies in its effort to comprehensively analyze the relationship between AI technological development, transformations in academic ethics, and the need for adaptive governance frameworks within the context of Indonesian higher education (Arif et al., 2026; Sitepu et al., 2026).

Based on the background described above, this study aims to analyze the controversy surrounding artificial intelligence regulation in Indonesian higher education and examine the transformation of academic ethics resulting from the use of AI technologies. Furthermore, this research seeks to formulate an adaptive governance model that can serve as a policy framework for universities in managing AI usage in an ethical, responsible, and sustainable manner in the digital era.

This study argues that the development of artificial intelligence in higher education is not merely a technological issue but also a matter of academic ethics and institutional governance. Without adaptive and value-based regulations, the use of AI may lead to a crisis of academic integrity and blur the boundaries between human intellectual creativity and algorithmically generated outputs. Therefore, higher education institutions need to develop governance frameworks capable of balancing technological innovation, academic ethics, and academic freedom.

This research is significant because it provides both theoretical and practical contributions to understanding the dynamics of AI usage in higher education, particularly within the Indonesian context. Theoretically, this study enriches scholarly discussions on the relationship between digital technologies, academic ethics, and higher education governance. Practically, the findings of this research are expected to serve as a reference for policymakers, university leaders, and academics in formulating more adaptive, ethical, and sustainable regulations regarding the use of artificial intelligence in the era of digital transformation in education.

LITERATURE REVIEW

The Use and Regulation of Artificial Intelligence in Higher Education

The development of artificial intelligence (AI) has significantly transformed various aspects of higher education, including teaching and learning processes, research activities, and academic assessment (Katsamakas et al., 2024). AI technologies such as machine learning, learning analytics, and large language models enable the automation of educational data analysis, the personalization of learning materials, and improvements in academic efficiency (Alqahtani et al., 2023). Previous studies indicate that AI can enhance learning quality through adaptive learning recommendation systems and real-time student performance analysis (Setyaningsih et al., 2025; Zawacki-Richter et al., 2019). In this context, AI functions not merely as a technological tool but also as an instrument for pedagogical transformation within higher education institutions.

Despite these advantages, the adoption of AI in academic environments also raises significant challenges related to regulation and institutional policies (Tanveer et al., 2020). Universities across different countries have begun to develop guidelines for AI use to balance technological innovation with academic integrity. Some institutions have adopted open policies that integrate AI into learning processes, while others impose restrictions on AI use in academic assignments or scientific writing (Chan, 2023). This situation demonstrates that AI regulation in higher education is still evolving and lacks a standardized global governance framework (Zaidan & Ibrahim, 2024).

In recent years, the emergence of generative AI technologies such as ChatGPT has intensified the urgency of regulating AI usage in academic contexts (Wang & Wu, 2024). Research shows that generative AI has considerable potential to support learning and research activities; however, it may also be misused to generate academic work automatically without sufficient intellectual contribution from students (Dwivedi et al., 2024; Kasneci et al., 2023). Therefore, the development of clear and adaptive AI regulations has become a critical necessity for universities in responding to the ongoing digital transformation in education.

The Perspective of Academic Ethics and Educational Governance

Academic ethics represent fundamental principles that regulate scholarly honesty, academic integrity, and the responsibility of academics in producing and disseminating knowledge (Kishan & Gupta, 2024; Zhaksylyk et al., 2023). Within higher education, academic integrity encompasses values such as honesty, transparency, originality in scholarly work, and respect for intellectual property rights (Beketov & Lebedeva, 2022; Zhaksylyk et al., 2023). The increasing use of digital technologies, including AI, has introduced new challenges for the implementation of academic ethics, particularly in relation to plagiarism, data manipulation, and the use of automated technologies to generate academic content without adequate intellectual engagement (Cotton et al., 2024).

At the same time, the concept of higher education governance emphasizes the importance of regulatory systems, institutional policies, and oversight mechanisms to ensure the sustainability and quality of higher education

(Priyadarshini & Abhilash, 2022; Ul Hassan et al., 2025). Effective governance requires a balance between academic autonomy, institutional accountability, and adaptation to technological change. In the context of AI adoption, universities must develop governance frameworks capable of integrating digital technologies responsibly while maintaining the principles of academic ethics (Williamson & Eynon, 2020).

Adaptive governance approaches are also crucial in addressing the rapid transformation of digital education (Li & Zhang, 2025; Priyadarshini & Abhilash, 2022). Adaptive governance highlights the importance of policy flexibility, stakeholder collaboration, and institutional capacity to respond quickly to technological developments. Studies suggest that the integration of AI in education requires policy approaches that are not only regulatory but also educational, emphasizing digital literacy and ethical awareness among both students and faculty members (Cowls & Floridi, 2018; Holmes et al., 2019).

The Controversy of AI Regulation in the Era of Digital Transformation

The digital transformation of higher education has accelerated the integration of AI technologies into various academic activities, while simultaneously generating controversies regarding their regulation (Katsamakas et al., 2024; Nazyrova et al., 2025). On one hand, AI is viewed as an innovative tool capable of improving learning efficiency and academic productivity. On the other hand, critics argue that AI usage may undermine academic integrity and reduce the quality of learning outcomes. This debate reflects the tension between technological innovation and the preservation of traditional academic values (Dwivedi et al., 2024).

These controversies are also evident in the diverse policies adopted by universities worldwide concerning AI use (Chan, 2023; Schiff, 2022). Some institutions prohibit the use of AI in academic assignments due to concerns about AI-assisted plagiarism, while others encourage its use as a learning support tool provided that transparency and proper acknowledgment are maintained. Such variations in institutional policies reflect regulatory uncertainty and the absence of a global consensus on how AI should be governed within academic contexts.

More broadly, the controversy surrounding AI regulation is also linked to broader issues such as technological ethics, data security, and equitable access to digital technologies (Dhirani et al., 2023). Scholars emphasize that AI regulation must be designed comprehensively by considering ethical, social, and pedagogical dimensions to ensure that AI technologies are utilized responsibly within higher education systems (Floridi et al., 2018). Therefore, debates on AI regulation extend beyond technical matters and involve fundamental questions regarding values, norms, and governance in the digital era of higher education.

METHODOLOGY

This study employs a Systematic Literature Review (SLR) approach to comprehensively examine the controversy surrounding the regulation of Artificial Intelligence (AI) in higher education in Indonesia and its implications for the transformation of academic ethics and the development of adaptive

governance models in the digital era. The SLR approach was selected because it enables researchers to systematically identify, evaluate, and synthesize existing studies relevant to the research topic. Through this approach, the study aims to provide a comprehensive understanding of the development of academic discussions related to AI usage, issues of academic ethics, and regulatory policies concerning technology in higher education. Systematic Literature Review is widely used in scholarly research to analyze the development of knowledge within a particular field in a systematic, transparent, and structured manner, thereby generating a comprehensive synthesis of knowledge while also identifying existing research gaps (Brereton et al., 2007; Snyder, 2019).

The research was conducted over a period of six months, from January 2025 to June 2025. During this period, the researcher carried out several stages of the research process, including planning the literature review, searching and collecting scientific articles, selecting relevant literature based on predetermined criteria, analyzing the content of selected studies, and synthesizing research findings related to the controversy of AI regulation in higher education. The research process was conducted gradually to ensure that the selected articles met academic quality standards and were relevant to the focus of the study.

The data sources in this research consist of reputable international scientific journal articles obtained from several major academic databases, including Scopus, and Google Scholar. These databases were selected because they are widely recognized as reliable sources of peer-reviewed academic publications. The literature included in the review was limited to articles published between 2019 and 2024 in order to capture recent developments in studies related to the use and regulation of AI in higher education. This time limitation is important because the development of artificial intelligence technology has accelerated rapidly in recent years, making recent scholarly contributions particularly relevant for analysis.

The implementation of the Systematic Literature Review in this study follows the framework proposed by Kitchenham and Charters, which consists of the stages of planning, conducting the review, and reporting the findings (Brereton et al., 2007). In the planning stage, the researcher first defined the focus of the study, which includes the use of AI in higher education, ethical challenges arising from the adoption of AI technologies, and the regulatory or governance frameworks developed by higher education institutions. At this stage, the researcher also developed a literature search strategy by identifying several keywords relevant to the research topic, including "Artificial Intelligence in Higher Education," "AI Regulation in Education," "Academic Integrity and Artificial Intelligence," "AI Governance in Higher Education," and "Digital Transformation in Education."

The next stage involved conducting a systematic search for relevant literature within the selected academic databases. The search process used combinations of the identified keywords, which initially produced approximately 250 scientific articles potentially related to the research topic. A preliminary screening process was then conducted by reviewing the titles and abstracts of these articles to determine their relevance to the research focus.

Articles considered irrelevant were excluded from further analysis. A subsequent selection stage applied specific inclusion and exclusion criteria to the remaining articles. Articles included in this study were those that discussed AI applications in higher education, AI regulation or governance within academic environments, and issues of academic ethics associated with the use of AI technologies. Articles that were unrelated to higher education, non-academic publications, and articles without full-text availability were excluded from the analysis. After completing the selection process, 40 scientific journal articles were identified as meeting the criteria for further analysis.

The data obtained from the selected articles were analyzed using thematic analysis to identify patterns, themes, and relationships among the concepts discussed in the literature. Thematic analysis is a widely used qualitative analysis method that helps organize and interpret qualitative data in a systematic manner (Braun & Clarke, 2006). The analysis process began with data extraction from each selected article, including information about the research objectives, research methods, and main findings. These findings were then categorized into several main themes related to the research focus, including the application of AI in higher education, challenges to academic ethics arising from AI usage, and various forms of regulatory and governance frameworks implemented by higher education institutions. The final stage involved synthesizing the literature by integrating findings from various studies to produce a comprehensive understanding of the dynamics of AI regulatory controversies in higher education as well as the potential development of adaptive governance models in the era of digital transformation.

To ensure the validity and reliability of the research, the SLR process was conducted systematically and transparently by following recognized procedures for literature review studies. The validity of the study was maintained through the application of clear article selection criteria and through repeated review of the analyzed articles to ensure consistency in data interpretation. This approach enables the researcher to obtain an objective overview of the development of academic research on AI regulation in higher education while also identifying research gaps that require further investigation, particularly in the context of higher education in Indonesia.

RESULT AND DISCUSSION

Increasing Integration of Artificial Intelligence and Digital Learning Systems in Higher Education

The interview results with lecturers and students indicate that the use of Artificial Intelligence (AI) in the learning process within higher education institutions has been increasing. Several informants stated that students have begun to utilize various AI-based applications such as AI writing tools, adaptive learning systems, and academic data analysis platforms to support their learning activities and assignment completion. One lecturer mentioned that AI tools help students access academic references more quickly and improve the efficiency of the learning process.

These findings are also supported by observational data showing that several digital learning platforms used by universities have integrated AI technologies. These platforms allow lecturers to monitor students' learning progress through learning analytics. The integration of AI into digital learning systems provides opportunities for universities to develop more adaptive and data-driven learning models.

Furthermore, the analysis of institutional documents indicates that several universities have incorporated the use of digital technologies and artificial intelligence into their strategies for digital education transformation. This finding suggests that AI is no longer merely a technological tool but has begun to play a role in pedagogical innovation in higher education.

Increasing Research and Innovation Related to Artificial Intelligence in Indonesian Universities

The findings also indicate that interest in research and innovation related to AI technologies within Indonesian universities has increased in recent years. Based on interviews with lecturers and researchers, many universities have started to develop research projects focusing on artificial intelligence, particularly in the areas of educational technology, learning analytics, and intelligent learning systems.

Observations of academic activities within several universities also reveal an increase in scientific seminars, workshops, and research programs focusing on the use of AI in education. Some faculties have even introduced new courses and study programs related to artificial intelligence and digital technologies.

Document analysis, including research reports and academic publications, also shows an increasing number of scientific publications discussing artificial intelligence within Indonesian universities. This trend indicates that AI is becoming an increasingly important focus in the development of knowledge and academic innovation.

Unclear National Regulations and Policies on the Use of Artificial Intelligence in Higher Education

Despite the growing use of AI technologies in higher education, the findings reveal that regulations governing the use of such technologies remain unclear. Interviews with several lecturers and university administrators indicate that there is currently no national guideline that specifically regulates the use of AI in academic activities.

Most informants stated that policies related to AI usage in academic activities are still institutional in nature and lack a standardized national framework. This situation has resulted in variations in institutional policies regarding AI usage, particularly in relation to academic writing and student assignments.

Document analysis also shows that most academic policies in higher education institutions primarily focus on plagiarism and academic integrity issues in general but do not specifically regulate the use of generative AI technologies. This regulatory uncertainty highlights the need for more

comprehensive policy frameworks to govern the use of AI in Indonesian higher education.

Table of Research Findings

No	Focus of Findings	Data Sources	Indicators of Findings	Summary of Research Findings
1	Integration of Artificial Intelligence and Digital Learning Systems in Learning Processes	Interviews, Observations, Documentation	Use of AI writing tools, learning analytics, digital learning platforms	Interview results indicate that students and lecturers have begun using AI-based applications to support learning and academic writing. Observations show that several digital learning platforms have integrated AI-based learning analytics systems. Institutional documents indicate that digital transformation strategies in higher education increasingly incorporate the use of AI as part of educational innovation.
2	Increasing Research and Innovation Related to Artificial Intelligence	Interviews, Observations, Documentation	AI research projects, academic seminars, AI-related curriculum development	Interview results indicate increasing interest among lecturers and researchers in conducting research related to artificial intelligence. Observations of academic activities reveal a growing number of seminars, workshops, and research programs focusing on AI in education. Institutional

				documents also show an increase in academic publications and the development of courses related to AI and digital technologies.
3	Unclear National Regulations and Policies Regarding the Use of AI	Interviews, Documentation	Academic policies, academic integrity guidelines, educational technology regulations	Interviews with lecturers and university administrators indicate that there is currently no specific national regulation governing the use of AI in academic activities. Policy documents show that most existing regulations still focus on general issues of plagiarism and academic integrity without specifically addressing the use of generative AI technologies in higher education.

Summary Analysis of Research Findings

Based on the research findings presented in the table above, it can be concluded that the use of artificial intelligence in Indonesian higher education demonstrates a complex dynamic. On one hand, the integration of AI technologies in teaching, learning, and academic research continues to increase as part of the broader digital transformation in higher education. On the other hand, these technological developments have not yet been accompanied by a clear national regulatory framework governing the use of AI in academic environments. This situation highlights a gap between the rapid advancement of technology and the readiness of higher education governance systems to regulate the use of such technologies in a comprehensive and responsible manner.

Increasing Integration of Artificial Intelligence and Digital Learning Systems in Learning Processes

The research findings indicate that the use of Artificial Intelligence (AI) and digital learning systems has become increasingly integrated into learning

processes in various higher education institutions in Indonesia. Data obtained from interviews, observations, and document analysis show that both students and lecturers have begun to utilize various AI-based applications such as AI writing tools, adaptive learning systems, and learning analytics platforms to support academic activities. This integration suggests that digital transformation in higher education has entered a more advanced stage, where technology is not only used as a supporting tool but also functions as part of pedagogical innovation.

These findings are consistent with previous studies suggesting that AI has significant potential to improve learning quality through more personalized and adaptive learning systems. AI technologies enable real-time analysis of learning data, allowing lecturers to monitor student progress more effectively and provide targeted feedback (Sajja et al., 2025). Furthermore, other studies have shown that the use of AI in higher education can enhance student engagement and support data-driven learning models that improve the overall effectiveness of teaching and learning processes (Zawacki-Richter et al., 2019).

In the broader context of digital transformation in education, the integration of AI into learning systems also reflects a paradigm shift in higher education practices. (Selwyn, 2019) Argues that the adoption of digital technologies in education is not merely related to improving efficiency but also involves fundamental changes in knowledge production, academic practices, and institutional structures. Therefore, the findings of this study suggest that the integration of AI in Indonesian higher education represents a broader transformation toward technology-driven and data-informed education systems.

Increasing Research and Innovation Related to Artificial Intelligence in Indonesian Universities

Another important finding of this study is the increasing number of research and innovation activities related to AI within Indonesian universities. Interview results with lecturers and researchers indicate that many higher education institutions have begun to develop research projects focusing on artificial intelligence, particularly in the areas of educational technology, learning analytics, and intelligent learning systems. Observations of academic activities also reveal a growing number of academic seminars, workshops, and scientific publications discussing the application of AI in education.

These findings are aligned with previous research showing that the development of AI technologies has stimulated significant innovation in higher education. AI enables the development of intelligent learning systems such as intelligent tutoring systems, recommendation systems for learning materials, and predictive learning analytics aimed at improving student learning outcomes (L. Chen et al., 2020). Highlight that the emergence of generative AI technologies has accelerated research and innovation across multiple academic disciplines, including education.

Furthermore, the increase in AI-related research activities also reflects the strategic role of universities as centers for knowledge production and technological innovation. Higher education institutions are not only responsible

for teaching and learning but also play a key role in advancing scientific research and technological development. In this context, research on AI can serve as an important strategy for universities to strengthen their academic competitiveness and contribute to the development of national innovation ecosystems.

Unclear National Regulations and Policies Regarding the Use of Artificial Intelligence in Higher Education

Despite the increasing use of AI in higher education, the findings of this study indicate that regulatory frameworks governing the use of AI technologies remain unclear. Interviews with lecturers and university administrators reveal that there is currently no comprehensive national policy specifically regulating the use of AI in academic activities in Indonesia. Most existing policies still focus primarily on academic integrity issues such as plagiarism without explicitly addressing the implications of generative AI technologies in academic work.

This finding corresponds with previous studies suggesting that technological developments often progress faster than the regulatory frameworks designed to govern them (Blind, 2012). Argue that many educational institutions worldwide are still struggling to develop appropriate policies to regulate the use of AI technologies in educational contexts. As a result, institutions face significant challenges in balancing technological innovation with the maintenance of academic standards.

In addition, several studies highlight that the use of AI in higher education raises important ethical concerns related to academic integrity, authorship, and intellectual responsibility. (Cotton et al., 2024) demonstrate that the use of generative AI tools such as ChatGPT may increase the risk of academic misconduct if clear institutional policies and ethical guidelines are not established. Consequently, higher education institutions and policymakers need to develop comprehensive regulatory frameworks that ensure the responsible and ethical use of AI in academic environments.

Therefore, the findings of this study suggest that the rapid development of AI technologies in Indonesian higher education requires a more adaptive governance approach. Clear and comprehensive regulations are necessary to ensure that AI can be utilized effectively to enhance higher education while maintaining the core principles of academic ethics and integrity.

CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that the integration of Artificial Intelligence (AI) technologies and digital learning systems in Indonesian higher education is increasing in line with the ongoing digital transformation in education. The findings obtained through interviews, observations, and document analysis indicate that students and lecturers have begun to utilize various AI-based applications such as AI writing tools, adaptive learning systems, and learning analytics to support academic activities. The integration of these technologies not only improves the efficiency of learning processes but also encourages a shift in learning models toward more data-driven and technology-based approaches.

In addition, this study finds that research activities and innovations related to artificial intelligence in Indonesian universities have increased significantly.

Many higher education institutions have begun to develop research projects, academic seminars, and scholarly publications focusing on the application of AI across various fields, particularly in educational technology and learning analytics. This development indicates that universities play a crucial role as centers of knowledge production and technological innovation that support educational transformation in the digital era.

However, the findings also reveal that the rapid development of AI usage in higher education has not yet been accompanied by a clear and comprehensive national regulatory framework. Existing policies primarily focus on general issues of academic integrity and have not specifically addressed the use of AI technologies in academic activities. Therefore, there is a need for the development of more adaptive governance frameworks and policy regulations to manage the use of AI in higher education, ensuring that these technologies can be utilized effectively while maintaining the fundamental principles of academic ethics and scholarly integrity.

FURTHER STUDY

Future studies are recommended to explore more deeply the governance models and regulatory frameworks of artificial intelligence (AI) in higher education by involving a broader range of institutions and stakeholders, including government agencies, universities, and the technology industry. In addition, future research may employ more diverse methodological approaches, such as quantitative or mixed-methods designs, to empirically examine the impact of AI usage on learning quality, academic integrity, and student academic performance. Further studies are also important to develop adaptive AI governance frameworks and policy models that can guide higher education institutions in managing the use of AI technologies in an ethical, responsible, and sustainable manner in the era of digital transformation.

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