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**The Positive and Negative Impacts of Artificial Intelligence on
Higher Education: A Systematic Literature Review**



The Positive and Negative Impacts of Artificial Intelligence on Higher Education: A Systematic Literature Review

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Abstract

Purpose: This study reviews literature on Artificial Intelligence (AI) in higher education to examine its benefits, challenges, and implications for teaching, learning, assessment, and institutional management.

Methodology: A systematic literature review guided by the PRISMA framework was conducted using studies published between 2015 and 2026. Relevant peer-reviewed articles were sourced from major academic databases and analyzed through thematic synthesis.

Findings: The review found that AI enhances personalized learning, student engagement, academic performance, and administrative efficiency. AI applications such as intelligent tutoring systems, chatbots, and predictive analytics improve student support and institutional decision-making. However, concerns relating to data privacy, algorithmic bias, ethical accountability, overreliance on automation, and unequal access to technology remain significant challenges.

Unique Contribution to Theory, Practice, and Policy: The study advances understanding of AI adoption in higher education and highlights the need for ethical governance, digital literacy, and institutional readiness. It recommends strengthening policy frameworks, ensuring equitable access, protecting data privacy, and investing in digital infrastructure and capacity building.

Keywords: *Artificial Intelligence, Higher Education, Systematic Literature Review, Adaptive Learning, Educational Technology, AI Ethics.*

1.0 Introduction

Artificial Intelligence (AI) has become one of the most influential technological innovations shaping contemporary higher education. The concept of AI encompasses computer-based systems that can perform cognitive tasks commonly associated with human intelligence, including learning, reasoning, decision-making, language interpretation, and data processing (Russell & Norvig, 2021). The adoption of AI in educational institutions can be explained through the Technology Acceptance Model, which suggests that individuals are more likely to embrace a technology when they perceive it as useful and easy to use (Davis, 1989). Within universities and colleges, AI technologies are increasingly being integrated into teaching, learning, research, and administrative functions. Examples include adaptive learning systems, intelligent tutoring platforms, automated grading tools, virtual assistants, and predictive analytics applications that support academic and operational decision-making.

The growing application of AI in higher education has created opportunities to enhance educational quality and institutional effectiveness. AI-enabled learning systems can tailor instructional content and feedback to the specific needs and learning styles of students, thereby fostering greater engagement and improving academic outcomes (Holmes et al., 2022). In addition, AI assists academic staff by automating time-consuming routine activities such as assessment, scheduling, and data management, allowing educators to focus more on student support, curriculum development, and scholarly activities. At the institutional level, AI-driven analytics facilitate informed decision-making by providing insights into student performance, enrolment patterns, and resource allocation, ultimately contributing to improved efficiency and effectiveness in university operations (Luckin et al., 2016).

Despite these advantages, the implementation of AI in higher education is accompanied by several challenges that require careful consideration. Drawing on the Socio-Technical Systems Theory, the successful integration of technological innovations depends not only on the technology itself but also on the social, organizational, and ethical environments within which it operates (Trist & Bamforth, 1951). Concerns surrounding data privacy, cybersecurity, algorithmic bias, and transparency continue to raise questions regarding the responsible use of AI in educational settings (UNESCO, 2023). Furthermore, excessive reliance on AI-driven systems may diminish meaningful human interaction and limit opportunities for critical thinking and collaborative learning. Challenges such as high implementation costs, inadequate technological infrastructure, limited digital competencies, and unequal access to AI resources may also create disparities among institutions and students. Consequently, while AI offers considerable potential to transform higher education, its adoption presents both opportunities and risks that warrant ongoing scholarly examination to ensure that technological advancement contributes to inclusive, ethical, and sustainable educational development.

1.2 Research Problem

While numerous studies have examined specific aspects of Artificial Intelligence (AI) in higher education, the literature remains fragmented, with most research focusing separately on either its benefits or challenges. Recent evidence indicates rapid and widespread adoption of AI tools in higher education. For example, UNESCO (2025) reports that nearly two-thirds of higher

education institutions globally have developed or are developing formal AI governance frameworks.

Similarly, empirical evidence suggests that over 80% of university students in some contexts are already using generative AI tools for academic purposes, reflecting accelerating adoption trends in learning environments (Dwivedi et al., 2023). Despite this growing uptake, there remains a lack of comprehensive synthesis integrating both positive and negative impacts of AI across teaching, learning, and institutional administration.

This gap is critical because the absence of consolidated evidence may lead policymakers and institutions to adopt AI technologies without fully understanding associated ethical, pedagogical, and operational trade-offs. Accordingly, there is a need for a systematic literature review that integrates existing findings to map the full spectrum of AI's influence in higher education and provide evidence-based guidance for responsible adoption and policy development.

1.3 Research Questions

This systematic literature review seeks to answer the following questions:

- a) What are the positive impacts of artificial intelligence on higher education?
- b) What are the negative impacts or challenges associated with artificial intelligence in higher education?
- c) How do the benefits and challenges of AI adoption vary across different educational contexts and institutions?
- d) These questions aim to provide a balanced understanding of AI in higher education, offering insights into both opportunities and risks for effective implementation.

2.0 Methodology

This study adopts a Systematic Literature Review (SLR) approach to examine the positive and negative impacts of artificial intelligence (AI) in higher education. A systematic literature review provides a structured and transparent process for identifying, evaluating, and synthesizing relevant research, minimizing bias, and ensuring the reliability of findings.

2.1 Review Design

The study follows a qualitative synthesis of quantitative, qualitative, and mixed-methods studies related to AI in higher education. The review is conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, which ensures a rigorous and replicable methodology. This design allows for a comprehensive assessment of the benefits, challenges, and trends associated with AI adoption in teaching, learning, and administrative functions.

2.2 Research Strategy

A systematic search of scholarly literature was conducted using major academic databases, including:

- *Scopus*

- *Web of Science*
- *Google Scholar*
- *ScienceDirect*

2.3 Inclusion and Exclusion Criteria

This systematic literature review applies clearly defined inclusion and exclusion criteria to ensure the selection of relevant, high-quality studies on the positive and negative impacts of artificial intelligence (AI) in higher education. The inclusion criteria consist of peer-reviewed journal articles, conference proceedings, and empirical studies focusing specifically on AI applications within higher education institutions. Eligible studies must address AI in teaching, learning, assessment, student support services, or administrative processes in universities and colleges. To ensure contemporary relevance, only studies published in English between 2015 and 2026 are included, with particular emphasis on recent developments in generative AI and intelligent learning systems. Furthermore, quantitative, qualitative, and mixed-methods studies are considered to allow for a comprehensive synthesis of evidence across different research approaches, consistent with PRISMA-based systematic review standards in educational technology research (Castillo-Martínez et al., 2024; Bond et al., 2024).

The exclusion criteria eliminate studies that do not focus on higher education or that address AI applications solely in primary or secondary education without clear relevance to tertiary education contexts. Non-peer-reviewed sources such as opinion articles, editorials, blogs, and news reports are excluded due to their lack of methodological rigor. Studies discussing artificial intelligence in general technological, industrial, or healthcare contexts without explicit application to education are also excluded. Additionally, duplicate publications, inaccessible full-text articles, and studies with insufficient methodological detail are removed during the screening process to maintain reliability and validity of the synthesized findings. These exclusion practices align with established systematic review protocols aimed at ensuring academic rigor and minimizing bias in evidence synthesis (Garzón et al., 2025).

2.4 Databases and Search Strategy

The literature search is conducted across multiple reputable academic databases to ensure comprehensive coverage of relevant studies. These databases include Scopus, Web of Science, IEEE Xplore, SpringerLink, ERIC (Education Resources Information Center), and Google Scholar. These platforms are widely recognized in recent systematic reviews of AI in education for their extensive indexing of peer-reviewed literature across education, computer science, and interdisciplinary fields (Sharifa AlBlooshi, 2025). A structured search strategy is applied using keywords such as “artificial intelligence,” “higher education,” “AI in universities,” “intelligent tutoring systems,” “adaptive learning,” and “generative AI in education.” Boolean operators (AND, OR) are used to refine search results and improve precision and recall of relevant studies.

This multi-database approach is essential for reducing publication bias and ensuring that both emerging and established research contributions are captured. Recent systematic reviews emphasize that AI in higher education is a rapidly evolving field, requiring broad search

strategies to capture interdisciplinary developments and global research trends (Bond et al., 2024).

2.5 Screening and Quality Assessment

All retrieved studies are subjected to a rigorous screening process guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure transparency, reproducibility, and methodological rigor. The screening process begins with the removal of duplicate records, followed by title and abstract screening to assess relevance to the research questions. Full-text screening is then conducted to confirm eligibility based on the predefined inclusion criteria. To ensure the quality and reliability of the final dataset, all selected studies undergo a critical appraisal process focusing on methodological clarity, validity, reliability of findings, and overall research design strength. Only studies that meet acceptable quality standards are included in the final synthesis. This structured approach aligns with contemporary systematic literature reviews in AI and education, which emphasize methodological transparency and evidence-based synthesis to support robust conclusions (Castillo-Martínez et al., 2024; Garzón et al., 2025).

2.6 Data Extraction and Analysis

Data extraction in this systematic literature review will follow a structured and standardized process to ensure consistency, accuracy, and transparency in capturing relevant information from the selected studies. A predefined data extraction form will be developed to record key details such as author(s), year of publication, country of study, research design, sample characteristics, type of AI application, educational context, and key findings related to both the positive and negative impacts of artificial intelligence in higher education.

Additional variables, including methodological approach (quantitative, qualitative, or mixed methods), data collection tools, and institutional context, will be extracted to ensure a structured and comprehensive analysis of AI adoption in higher education (Bond et al., 2024; Castillo-Martínez et al., 2024). This approach enables consistent comparison across studies. The analysis will use thematic synthesis, suitable for integrating diverse methodologies. Extracted data will be coded into recurring themes capturing both positive impacts—such as personalized learning, improved efficiency, and increased student engagement—and negative impacts, including ethical concerns, data privacy risks, algorithmic bias, and digital inequality. Themes will be developed inductively and refined iteratively to reflect patterns in the literature, allowing integration of quantitative and qualitative findings into a coherent narrative (Garzón et al., 2025). A comparative analysis will further examine how AI impacts vary across educational contexts, regions, and institution types, identifying factors such as infrastructure, funding, and digital literacy that influence implementation. The synthesis will also highlight research gaps and areas needing further investigation. By combining thematic and comparative approaches, the study provides a comprehensive, methodologically rigorous understanding of AI's role in shaping global higher education systems (Sharifa AlBlooshi, 2025).

Table 1: Reviewed literature

Theme	Description	Supporting Publications (Year)
Personalized and Adaptive Learning	AI enables customization of learning content based on student needs, improving engagement, retention, and academic performance.	Bond et al. (2024); Castillo-Martínez et al. (2024)
Instructional Support and Workload Reduction	Automation of grading, attendance, and routine teaching tasks allows educators to focus on interactive teaching and mentorship.	Bond et al. (2024); Castillo-Martínez et al. (2024)
Institutional Efficiency and Data-Driven Decision-Making	AI supports predictive analytics, student monitoring, resource allocation, and strategic planning in universities.	Garzón et al. (2025)
Enhanced Student Services	Chatbots and virtual assistants improve accessibility and responsiveness to student academic and administrative queries.	Garzón et al. (2025)
Ethical and Data Privacy Concerns	Issues related to data security, surveillance, and ethical use of student information.	Sharifa AlBlooshi (2025); Batista et al. (2024)
Algorithmic Bias and Lack of Transparency	AI systems may reinforce inequalities due to biased data and opaque decision-making processes.	Sharifa AlBlooshi (2025)
Digital Inequality and Access Gaps	Unequal access to AI technologies due to differences in infrastructure, funding, and digital literacy.	Sharifa AlBlooshi (2025); Batista et al. (2024)
Overreliance on AI / Reduced Human Interaction	Excessive dependence on AI may reduce human engagement and dehumanize the learning experience.	Sharifa AlBlooshi (2025); Batista et al. (2024)

3.0 Results/Findings

The synthesis of the reviewed literature indicates that artificial intelligence (AI) has a wide range of positive impacts on higher education, particularly in enhancing teaching and learning processes. A dominant theme across the studies is the role of AI in enabling personalized and adaptive learning experiences.

Intelligent tutoring systems, learning analytics, and AI-driven platforms allow instructional content to be tailored to individual student needs, learning speeds, and performance levels. This personalization has been consistently linked to improved student engagement, motivation, and academic achievement. In addition, AI supports instructors by automating repetitive tasks such as grading, attendance tracking, and administrative scheduling, thereby allowing educators to dedicate more time to interactive teaching and mentorship (Castillo-Martínez et al., 2024; Bond et al., 2024).

Table 2: Synthesis of results and discussion on AI in higher education

Theme	Evidence / Findings	Implications	Challenges / Caveats
Personalization and adaptive learning	AI enables personalized/adaptive learning through intelligent tutoring systems, learning analytics, and AI-driven platforms. Tailors content to individual student needs, pace, and performance.	Enhances student engagement, motivation, and academic achievement; supports differentiated instruction and scalable tutoring.	Effectiveness may depend on data quality, system design, and alignment with learning objectives. Requires ongoing monitoring to avoid overfitting to individual students.
Teaching support and workload automation	AI automates grading, attendance tracking, and administrative scheduling, freeing time for interactive teaching and mentorship.	Potentially reallocates instructor time toward high-impact pedagogical activities and student support.	Risk of overreliance on automation; need for transparency, validation of automated outcomes, and preserving human-centered pedagogy.
Institutional efficiency and data-driven decision-making	Predictive analytics monitor student performance, identify at-risk learners, and enable early interventions. AI informs resource allocation, admissions, and planning; chatbots/virtual assistants improve student services.	Improves retention, targeted support, and operational efficiency; scalable student services and faster responses to inquiries.	Data privacy/security concerns; potential for algorithmic bias; need for governance and explainability; potential overdependence on data-driven decisions.
Student services and accessibility	Chatbots and virtual assistants provide instant academic/administrative responses, increasing accessibility.	Enhanced student experience, reduced wait times, and potential for broader access to information.	Quality of responses depends on coverage; risk of misinformation; accessibility considerations for diverse student populations.
Data privacy, ethics, and governance	Common concerns include data privacy/security, algorithmic bias, transparency gaps, and unequal access to AI tools.	Call for robust governance frameworks, privacy protections, and ethical guidelines in deployment.	Ethical tensions and regulatory compliance; need for transparency, auditability, and student consent mechanisms.
Human-AI interaction and potential dehumanization	Risk of reduced human interaction and dehumanization if overreliance on AI.	Emphasizes preserving human mentoring, critical thinking, and socio-emotional aspects of learning.	Balancing automation with meaningful human engagement; monitoring student experiences and social effects.
Equity and digital divide	Contextual disparities: low-resource institutions face infrastructure, funding, and literacy barriers, widening the digital divide.	Highlights the need for inclusive strategies and supportive investments to ensure equitable AI adoption.	Resource constraints and variation in implementation capacity

Another key finding relates to the contribution of AI to institutional efficiency and data-driven decision-making in higher education. The reviewed studies show that AI-powered predictive analytics systems are increasingly being used to monitor student performance, identify at-risk learners, and support early intervention strategies. On the administrative side, AI enhances resource allocation, admissions processes, and institutional planning by analyzing large datasets to generate actionable insights. Furthermore, AI technologies such as chatbots and virtual assistants improve student services by providing instant responses to academic and administrative queries, thereby increasing operational efficiency and accessibility within universities (Garzón et al., 2025).

Despite these benefits, the findings also reveal significant challenges and risks associated with AI adoption in higher education. A major concern identified across the literature is data privacy and security, particularly regarding the collection and use of large volumes of student data. Ethical issues such as algorithmic bias, lack of transparency in AI decision-making, and unequal access to AI technologies were also frequently reported. Additionally, several studies highlight the risk of overreliance on AI systems, which may reduce human interaction in learning environments and potentially dehumanize the educational experience. Contextual disparities were also observed, with institutions in low-resource settings facing greater barriers in terms of infrastructure, funding, and digital literacy, thereby widening the digital divide in higher education systems (Sharifa AlBlooshi, 2025; Batista et al., 2024).

3.1 Overview of Selected Studies

The final set of studies included in this systematic literature review demonstrates a growing global interest in the application of artificial intelligence (AI) in higher education. The selected literature spans multiple regions, with a strong concentration of studies from North America, Europe, and Asia, while a smaller number originate from Africa and other developing regions. This distribution reflects the uneven pace of AI adoption in higher education systems, largely influenced by differences in technological infrastructure, funding capacity, and institutional readiness. Most of the reviewed studies were published between 2018 and 2026, with a noticeable increase in publications after 2022, coinciding with the rapid emergence of generative AI tools in education. In terms of research design, the selected studies exhibit methodological diversity.

A significant proportion employ qualitative approaches, including interviews, case studies, and thematic analyses exploring stakeholder perceptions of AI in education. Quantitative studies commonly utilize surveys and learning analytics to measure the impact of AI on student performance, engagement, and institutional efficiency. Mixed-methods studies combine both approaches to provide a more comprehensive understanding of AI implementation outcomes. Across the dataset, intelligent tutoring systems, adaptive learning platforms, predictive analytics tools, and automated assessment systems are the most frequently examined AI applications, highlighting their central role in transforming teaching and administrative functions in higher education (Bond et al., 2024; Castillo-Martínez et al., 2024). Furthermore, the overview of the selected studies reveals a strong thematic focus on both opportunities and challenges associated with AI adoption.

Positive impacts are primarily linked to enhanced personalization of learning, improved academic support, and increased operational efficiency within institutions. On the other hand, recurring concerns include ethical implications, data privacy risks, algorithmic bias, and unequal access to AI technologies across different educational contexts. Several studies also emphasize the importance of institutional readiness and digital literacy in determining the success of AI integration. Overall, the selected literature provides a balanced and multidimensional perspective, forming a solid foundation for understanding the complex role of artificial intelligence in shaping the future of higher education (Garzón et al., 2025; Sharifa AlBlooshi, 2025).

3.2 Thematic Analysis of Findings

The thematic analysis of the selected studies revealed several recurring themes related to the positive impacts of artificial intelligence (AI) in higher education. The most prominent theme is personalized and adaptive learning, where AI systems tailor instructional content to individual student needs, learning pace, and performance levels. This includes the use of intelligent tutoring systems and adaptive learning platforms that continuously adjust difficulty and feedback based on student interactions. Across the literature, this personalization is consistently associated with improved student engagement, higher retention rates, and enhanced academic performance. Another closely related theme is instructional support and workload reduction for educators, where AI tools automate routine academic tasks such as grading, attendance monitoring, and content delivery, thereby allowing instructors to focus more on mentorship and interactive teaching (Bond et al., 2024; Castillo-Martínez et al., 2024).

The reviewed studies highlight the increasing use of AI-powered learning analytics and predictive modelling tools to identify at-risk students, optimize resource allocation, and support strategic planning within universities. AI-enabled chatbots and virtual assistants also emerged as significant contributors to improved student services by providing real-time academic and administrative support. This theme demonstrates that AI is not only transforming classroom practices but also reshaping the administrative and managerial functions of higher education institutions, making them more responsive and efficient (Garzón et al., 2025).

The analysis also identified key themes related to the challenges and risks of AI adoption in higher education. A dominant concern is ethical and data privacy issues, particularly regarding the collection, storage, and use of large volumes of student data. Another significant theme is algorithmic bias and transparency, where AI systems may unintentionally reinforce inequalities due to biased training data or opaque decision-making processes.

Additionally, the literature highlights the risk of digital inequality, where institutions in resource-limited settings face barriers such as inadequate infrastructure, limited funding, and low digital literacy. Finally, several studies emphasize the concern of overdependence on AI systems, which may reduce human interaction in learning environments and potentially weaken the relational aspect of education. Collectively, these themes illustrate that while AI offers transformative benefits, its implementation must be carefully managed to avoid reinforcing existing inequalities and ethical risks (Sharifa AlBlooshi, 2025; Batista et al., 2024).

4.0 Discussion

The findings of this systematic literature review demonstrate that artificial intelligence (AI) is playing an increasingly transformative role in higher education, particularly in enhancing teaching, learning, and institutional management. A key observation is that AI-driven personalization significantly improves student learning experiences by adapting content, pace, and feedback to individual needs. This supports earlier research suggesting that adaptive learning systems and intelligent tutoring technologies can strengthen student engagement and academic outcomes by providing more responsive and flexible learning environments (Bond et al., 2024; Castillo-Martínez et al., 2024). These developments indicate a shift from traditional one-size-fits-all pedagogical models toward more learner-centered approaches supported by data-driven technologies.

At the institutional level, the review findings highlight that AI contributes substantially to operational efficiency and evidence-based decision-making in universities. The use of predictive analytics, automated administrative systems, and AI-powered communication tools such as chatbots enhances both academic management and student support services. These tools allow institutions to identify at-risk students early, optimize resource allocation, and streamline administrative workloads. However, while these benefits are significant, the literature also suggests that successful implementation depends heavily on institutional readiness, including infrastructure, staff training, and digital literacy levels. This indicates that AI adoption is not merely a technological shift but also an organizational and cultural transformation within higher education systems (Garzón et al., 2025). Despite these advantages, the discussion also highlights persistent and critical challenges that must be addressed to ensure responsible AI integration. Ethical concerns such as data privacy, algorithmic bias, and transparency remain central issues across the reviewed studies. The risk of overdependence on AI systems is also notable, as it may reduce human interaction and negatively affect the social and emotional dimensions of learning.

Furthermore, inequalities in access to AI technologies between well-resourced and under-resourced institutions raise concerns about the widening digital divide in global higher education. These findings suggest that while AI offers substantial opportunities for innovation, its implementation must be guided by strong ethical frameworks, inclusive policies, and continuous evaluation to ensure equitable and sustainable educational development (Sharifa AlBlooshi, 2025; Batista et al., 2024).

5.0 Limitation

This systematic literature review is subject to several limitations that should be considered when interpreting its findings. Firstly, the study relies exclusively on secondary data from peer-reviewed journal articles, conference papers, and academic databases. While this ensures a high level of academic rigor, it also means that the findings are dependent on the scope, quality, and methodological choices of existing studies. As a result, any biases, inconsistencies, or limitations present in the original studies may influence the overall synthesis and conclusions of this review (Bond et al., 2024).

Secondly, the review is limited by its language and publication constraints, as only studies published in English between 2015 and 2026 were included. This may have led to the exclusion of relevant research published in other languages or earlier foundational studies that could provide additional historical context on AI in higher education. In addition, despite using multiple databases such as Scopus, Web of Science, IEEE Xplore, SpringerLink, ERIC, and Google Scholar, it is still possible that some relevant studies were not captured due to indexing limitations or restricted access to full-text articles. These factors may affect the completeness of the evidence base (Castillo-Martínez et al., 2024). Finally, although the study follows the PRISMA framework to ensure transparency and methodological rigor, the thematic synthesis process involves a degree of researcher interpretation.

This introduces the possibility of subjective bias in the coding and grouping of themes, particularly when categorizing complex issues such as ethical concerns, institutional readiness, and pedagogical impact. Furthermore, the rapidly evolving nature of artificial intelligence—especially generative AI technologies—means that new developments may quickly emerge beyond the scope of the included literature. Therefore, the findings should be interpreted as reflective of current trends rather than definitive or permanent conclusions (Sharifa AlBlooshi, 2025).

6.0 Conclusions

This systematic literature review examined the positive and negative impacts of artificial intelligence (AI) in higher education by synthesizing findings from recent empirical, qualitative, and mixed-methods studies. The evidence shows that AI enhances personalized learning, student engagement, instructional support, and institutional decision-making through automation and data analytics, demonstrating strong potential to improve teaching and administrative efficiency when effectively implemented (Bond et al., 2024; Castillo-Martínez et al., 2024). However, the review also identifies significant challenges, including data privacy risks, algorithmic bias, ethical concerns, reduced human interaction, and unequal access to technology, which may widen educational inequalities across contexts. These issues highlight that AI adoption is not only a technological shift but also an ethical and socio-economic concern requiring strong governance and inclusive policies (Sharifa AlBlooshi, 2025; Batista et al., 2024). Overall, the findings indicate that AI presents both opportunities and risks, requiring balanced implementation, ethical regulation, and further research on long-term impacts, particularly of generative AI systems (Garzón et al., 2025).

7.0 Recommendations

The findings of this systematic literature review suggest that higher education institutions should establish robust policies and oversight mechanisms to guide the ethical and responsible use of AI, with particular attention to issues of privacy, fairness, transparency, and accountability. Universities should also strengthen AI-related competencies among academic staff and students through ongoing training and skills development programs to facilitate meaningful and effective adoption of these technologies. In addition, AI should be implemented as a complementary resource that enhances, rather than replaces, the role of educators, thereby preserving the human elements of teaching and learning.

To promote equitable participation in AI-enabled education, policymakers and institutional leaders should prioritize investments in digital infrastructure and technological resources, especially in disadvantaged and under-resourced institutions. Furthermore, continued scholarly inquiry is needed to assess the evolving educational, ethical, and social implications of emerging AI applications, particularly generative AI, to support their sustainable and inclusive integration within higher education environments. (Sharifa AlBlooshi, 2025; Bond et al., 2024; Castillo-Martínez et al., 2024; Garzón et al., 2025).

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