

Benefits, Threats, and Mitigation Strategies of Artificial Intelligence in Higher Education: A Narrative Literature Review

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Abstract

This narrative literature review examined the multifaceted role of artificial intelligence (AI) in higher education, encompassing its benefits, associated risks, and mitigation strategies, with a particular focus on sub-Saharan Africa. Drawing on a variety of contemporary scholarly sources, the study categorises AI's contributions to teaching, research, student support, and institutional governance. Methodologically, the review draws on data from both global and regional literature to present a critical and contextualised perspective on AI's growing role in higher education. The findings show that AI improves efficiency, enables personalised learning, broadens access, and boosts research productivity. However, it also raises considerable threats, particularly regarding academic integrity, data privacy, algorithmic bias, and epistemic imbalance. These concerns are particularly pronounced in sub-Saharan Africa, where significant infrastructure and policy gaps persist. While AI has transformative potential, its implementation must be ethical, contextually relevant, and inclusive of varied educational contexts. Establishing institutional AI governance frameworks, investing in AI literacy for staff and students, promoting localised tool development, and incorporating student and academic staff perspectives into AI-related decision-making processes are among the recommendations. Finally, the

study advocates for a transition from reactive adoption to proactive, equity-driven AI integration in higher education.

Keywords: *Artificial intelligence; Higher education; AI ethics; Data privacy; Academic integrity; sub-Saharan Africa.*

Introduction

Artificial intelligence (AI) has rapidly progressed from the realm of experimental research to the centre of daily life, altering how people learn, work, and interact. Higher education institutions are increasingly adopting AI systems that mimic human intelligence to improve teaching, learning, research, and administration (O'Dea & O'Dea, 2023). Deep learning, machine learning, and natural language processing are three standard AI technologies. These systems enable computers to reproduce human reasoning, learning, and decision-making (Holmes et al., 2019). In this study, AI refers explicitly to generative technologies, such as ChatGPT and Jenni AI, which utilise extensive language models to generate human-like content for academic, administrative, and creative purposes.

Because AI has gained prominence, the number of tools available for various academic and administrative purposes has also increased. These tools can be divided into many categories, such as generative technologies (e.g., ChatGPT, Claude, and Bard) that develop content based on user prompts, productivity tools (e.g., Grammarly, QuillBot, and Canva) that help with editing, formatting, and presentation design, research support tools (e.g., Elicit, Research Rabbit, and Scite) for literature reviews, summaries, and citation management, content interaction tools (e.g., AskYourPDF, ChatDOC) for interactive document engagement, and AI-detection tools (e.g., ZeroGPT, GPTZero) for identifying AI-generated work. While these tools provide obvious benefits, they also raise new questions about ethics, academic integrity, and the nature of learning.

Several studies have explored the application of AI in higher education teaching and learning (e.g., Abdelaal & Al Sawi, 2024; Eager & Brunton, 2023; Vargas-Murillo et al., 2023; Hooda et al., 2022). However, many of these studies focus primarily on the classroom environment, i.e., how AI aids teaching and assessment, while paying limited attention to other key areas. There is a paucity of research regarding how AI affects administrative functions, academic integrity, data privacy, and epistemic dependency. Ethical concerns, particularly how AI affects the interactions between students, lecturers, and knowledge, are usually overlooked. Furthermore, few studies have provided a balanced assessment of the benefits and hazards of AI applications in various academic settings. This paper filled this gap by providing a comprehensive narrative review of the literature on the benefits, threats, and measures for ethical AI usage in higher education. The goal was to provide educators and policymakers with the insight to make informed decisions about AI integration.

Methodology

This study used a narrative literature review approach to investigate and synthesise scholarly views on the benefits, threats, and mitigation strategies associated with the use of artificial intelligence (AI) in higher education. We opted for a narrative review because it

allows for a deeper, more interpretive engagement with the current literature, particularly on a topic with a constantly evolving scope, application, and discussion. Unlike systematic reviews, which employ rigorous processes to address narrowly stated research questions, narrative reviews integrate multiple sources to present a comprehensive picture of emerging patterns, contradictions, and conceptual gaps.

Scope and search strategy

This review focused on scholarly materials published between 2019 and 2025, a period during which generative AI tools in education, such as ChatGPT, Elicit, and QuillBot, underwent rapid evolution. The search focused on peer-reviewed journal articles, conference papers, institutional reports, and working papers, which were accessible through databases such as Google Scholar, ERIC, Emerald Insight, SpringerLink, and DOAJ. The key search terms were “Artificial Intelligence”, “AI in Higher Education”, “AI ethics”, and “AI threats and benefits”. The inclusion criteria prioritised English-language research that directly addressed AI applications in higher education, such as advantages, hazards, or mitigation techniques. We also considered conference proceedings. Non-English sources, studies unrelated to higher education, grey literature, and publications that addressed AI but did not delve into its educational implications were excluded. This approach ensured a focused, relevant, and academically rigorous evidence base for examining the impact of AI on higher education.

Study selection and review process

The initial search yielded approximately 186 publications, which were then screened based on title and abstract. We deleted duplicates and obtained full text for 78 articles that matched the inclusion requirements. After a more rigorous review for relevance and conceptual depth, we selected 52 papers for the final synthesis. Although a formal PRISMA flow diagram is not necessary for narrative reviews, the review process reflected PRISMA's transparency by documenting article selection phases to ensure traceability.

Quality appraisal

Whereas narrative reviews characteristically do not employ thorough quality assessment tools, we applied the basic **appraisal framework adapted from the Critical Appraisal Skills Programme (CASP)** to enable us to scientifically evaluate the dependability, relevance, and results of published papers. Accordingly, we assessed each article against the clarity of its purpose and research question, the relevance and robustness of its methodology, and its contribution to the conceptual understanding of AI in higher education. This flexible quality check helped ensure that only studies with satisfactory academic rigour and relevance to the review themes were included.

Data extraction and thematic analysis

We organised data into a matrix based on author, year, nation, focal area (teaching, learning, administration, ethics), and significant conclusions. Thematic analysis followed Braun and Clarke's (2006) six-phase framework, which included familiarising with the literature, coding key ideas (e.g., “adaptive learning”, “data privacy”), identifying and grouping themes (e.g., pedagogical value, epistemic risk), reviewing and refining themes, clearly naming them, and crafting a narrative aligned with the study's goals. This process

produced three main themes: (i) AI benefits, such as personalised learning, research support, and administrative efficiency; (ii) AI threats, such as academic dishonesty, loss of epistemic agency, and job displacement; and (iii) responsible integration strategies, such as ethical frameworks, staff training, and policy development.

Reflexivity

We acknowledge the possibility of subjectivity and interpretative bias in literature selection. However, the inclusion of a well-known thematic analysis framework, thorough source screening, and multidisciplinary references boosts the study's credibility. The review sought to provide a grounded synthesis to assist future research and higher education policy on AI. We conducted a thorough literature search using topics such as "AI", "Machine Learning", "Higher Education", "Opportunities", "Threats", and "Challenges" in academic databases, including Emerald, ERIC, and Google Scholar. The study examined peer-reviewed journal articles and conference papers to identify key themes related to the benefits, risks, and measures for the responsible implementation of AI. These are summarised in Table 1.

Summary of Reviewed Studies on AI in Higher Education (HE)

Table 1 below includes a selection of the 35 significant studies discussed in this narrative synthesis. The studies are geographically diverse and focus on a variety of topics, including teaching, learning, administration, ethics, and research output. This arrangement reflects the review's thematic focus and facilitates the development of the three major themes mentioned in the following section.

Table 1: Studies on the benefits, threats and mitigation strategies of AI in higher education

Author(s)	Year	Country /Region	Focus Area	Study Type	Key Findings or Insights
Hooda et al.	2022	India	Assessment & feedback	Empirical (quantitative)	AI enhances fairness in grading and student engagement through instant feedback
Abdelaal & Al Sawi	(2024).	UAE	Ethics, perceptions	Survey	Professors see AI as helpful but express concerns over misuse and policy gaps
Zawacki-Richter et al.	2019	Global	Systematic review of AI in HE	Systematic review	Most AI research in higher education (HE) focuses on STEM fields, with limited attention to equity and ethics
Vargas-Murillo et al.	2023	Latin America	ChatGPT use in HE	Systematic review	Revealed mixed student experiences and epistemic dependency concerns
Jokhan et al.	2022	Fiji	Inclusion & infrastructure	Case study	AI enables inclusive education, but infrastructural challenges persist

Pedro	2020	OECD countries	Applications in HE	Policy review	AI supports adaptive learning and assessment efficiency
Jia & Tu	2024	China	Student motivation & learning	Empirical (quantitative)	AI enhances critical thinking and learning awareness
Salido	2023	Spain	Learning impact	Experimental	AI tools boost understanding but risk critical thinking
Howard et al.	2018	UK	Student support systems	Predictive modelling	AI predicts student dropouts, enabling early intervention
Steele	2023	USA	Learning design	Conceptual	Empowering students to use AI ethically is key to future learning
Srivastava et al.	2021	India	Inclusive education	Design research	Innovative learning tools improve access for students with disabilities
Holmes et al.	2019	Global	AI frameworks in education	Narrative review	AI simulates human cognition and transforms education delivery
Chen et al.	2020	China	AI in education	Review	AI automates grading and feedback processes
Nzoka	2024	Kenya	Employment concerns	Opinion piece	AI may replace education jobs if unchecked
Mugizi & Rwothumio	2023	Uganda	E-learning capacity	Survey	University e-readiness influences AI adoption success
Shete et al.	2024	India	Personalisation	Quantitative	AI boosts performance through personalised learning
Lestari et al.	2025	Indonesia	Libraries & AI	Qualitative	AI reduces textbook usage among students
Li	2023	China	Ethics & CV	Conceptual	Calls for stronger ethical frameworks in AI development
Salloum	2024	UAE	Classroom integrity	Literature review	Highlights AI risks for classroom honesty
Jarek & Mazurek	2019	Poland	AI in marketing	Applied review	AI improves data-driven decision-making
Khalifa & Albadawy	2024	Egypt	Academic writing	Applied research	AI enhances academic writing productivity
Westman et al.	2021	Finland	Career guidance	Policy-oriented study	AI supports tailored student career paths
Tarisayi	2024	Zimbabwe	Strategic leadership	Workshop proceedings	Leadership critical for responsible AI adoption
Eager & Brunton	2023	Australia	Teaching enhancement	Conceptual paper	Promotes AI-augmented pedagogy

O'Dea & O'Dea	2023	USA	Teaching & learning	Conceptual	AI reshaping university teaching models
Schoeman et al.	2017	South Africa	Readiness for AI	Exploratory	Calls for capacity-building in AI governance
Devineni	2024	USA	Privacy & ethics	Empirical	Exposes privacy risks in AI-powered platforms
Elamin	2024	UAE	Historical perspectives	Historical analysis	Traces the evolution and challenges of AI
Major & Francis	2020	UK	Personalised learning	Rapid evidence review	Tech-supported learning improves outcomes
Oliveira & Figueiredo	2024	Portugal	AI & law	Conceptual	Explores legal implications of AI in education
Fidalgo & Thormann	2024	Global	Lifelong learning & AI	Conceptual	AI fosters continuous learning aligned with SDGs
Saman	2023	Pakistan	Language education	Review	ChatGPT influences English language teaching and learner autonomy
Das et al.	2023	India	Personalisation impact	Quantitative	AI-driven personalisation improves learner performance
Shahriar et al.	2023	USA	Privacy risks	Survey review	Identifies risks and proposes mitigation in the AI lifecycle
UNESCO	2019	Global	AI & SDGs	Policy brief	AI can support inclusive and equitable quality education

Source: Authors' compilation from reviewed literature (2025).

Benefits of Artificial Intelligence in Higher Education

Artificial intelligence has transformed higher education, providing capabilities that were previously unimaginable. To fully realise its potential, it is necessary to look beyond the hype and investigate the precise, evidence-based benefits AI provides across major functional domains in higher education. The following review synthesises recent empirical and conceptual studies that highlight how AI improves pedagogy, institutional governance, research, access, and student well-being while also identifying areas where the literature may overstate or underexplore its potential, particularly in sub-Saharan Africa.

Personalised learning and pedagogical adaptivity

Large-scale, personalised learning is one of the university teaching practices being transformed by AI. In AI, intelligent tutoring systems, adaptive assessments, and learning analytics are used to selectively adapt the delivery of content in real-time according to the individual learner's needs, something that is frequently not possible in the classroom. According to Shete et al. (2024), AI-based adaptive learning systems significantly enhance academic performance by relating content complexity to student performance. Similarly, Hooda et al. (2022) found that integrating real-time AI feedback to formative evaluations enhances student engagement and satisfaction. Moreover, Jia and Tu (2024) highlight that

personalised AI enhances the self-regulated learning behaviours of better learners, which are essential for success in post-secondary education.

Teachers could also take advantage of AI in education through technology such as dashboards to visualise student achievement and identify at-risk students. Pedro (2020) refers to this as just-in-time teaching, where teaching strategies are preemptively adjusted using data-driven insights, which encourages a more responsive and student-centred teaching approach. Nonetheless, some loopholes remain. Much of the available literature focuses on short-term academic performance, and the use of experimental or quasi-experimental methods hinders the understanding of the long-term educational effects of AI (Merino-Campos, 2025; Zawacki-Richter et al., 2019). Furthermore, the majority of the literature focuses on STEM topics without giving sufficient attention to the social sciences, humanities, and arts (Zawacki-Richter et al., 2019). Similarly, the majority of research is conducted in high-income countries. The still vastly underrepresented areas include sub-Saharan Africa, Latin America, and Southeast Asia, despite their having particular digital infrastructural and educational requirements. As such, more interdisciplinary, longitudinal, and geographically diverse studies are necessary to realise AI's fair and successful integration in higher education across the world.

Administrative efficiency and data-informed governance

AI is revamping how students are supported, how decisions are made, and how resources are managed, making universities more efficient and responsive. Predictive dashboards and tools powered by AI help to monitor enrolment patterns, target vulnerable students, and customise academic guidance. Zawacki-Richter et al. (2019) explain how such systems integrate academic, behavioural, and demographic data to enable timely interventions. Westman et al. (2021) state that AI-informed career advisory systems align student profiles with live labour market trends, enabling institutions to offer proactive support. Monotonous workloads are also lessened with administrative automation. AI chatbots, supported by natural language processing (NLP), are taking over responsibilities such as course registration requests, schedule modifications, and document delivery (Srivastava et al., 2021), allowing professionals to focus on higher-level tasks. Additionally, AI facilitates data-driven decision-making, allowing managers to concentrate on more strategic tasks (Howard et al., 2018).

Nevertheless, most studies rely on descriptive case analyses or pilot programs, restricting their applicability (Merino-Campos, 2025). Studies that employ a longitudinal and mixed-methods approach to examine how institutions adapt to AI over time are rare. In addition, most research is conducted in universities with substantial resources in high-income countries, leaving a research gap in the applicability of AI in enhancing administration in low-resource settings, such as sub-Saharan Africa and Southeast Asia (Boateng, 2024). The views of staff are also under-investigated. Although AI could be an efficiency boost in task completion, little is understood about how academic and administrative professionals perceive the changes and whether they feel empowered, displaced, or supported. Moreover, the impact of digital preparedness and organisational culture on the successful integration of AI is understudied. To sum up, AI is transforming the way universities are governed, yet its further success will rely on inclusive and context-sensitive innovation made possible by diverse research.

Expanding educational access and inclusion

Artificial Intelligence holds great promise for enhancing access and inclusion in higher education, particularly for students who have been historically excluded. AI tools, such as speech-to-text, voice assistants, and automated captioning, have helped students with impairments learn more effectively. For example, Jokhan et al. (2022) developed accessibility solutions that enhanced digital content for visually challenged individuals at the University of the South Pacific. Similarly, Srivastava et al. (2021) emphasise how real-time translation and subtitling features aid multilingual learners in overcoming language barriers in various classrooms. Artificial intelligence is also helping to bridge the urban-rural divide. Mobile-based AI learning solutions enable students in remote areas to access personalised, high-quality educational information without requiring advanced infrastructure (Pedro, 2020). These technologies adapt materials to individual performance, making them feasible even in resource-constrained settings—a critical advantage for regions like sub-Saharan Africa, where access to university education is hindered by distance and inadequate infrastructure (Salmi, 2022).

However, existing research frequently focuses on short-term results from experimental initiatives in well-funded institutions. Few long-term studies investigate how AI promotes long-term academic inclusion and social integration (Merino-Campos, 2025). Furthermore, most studies are conducted in high-income nations, leaving unreported the experiences of students and institutions in low-resource or linguistically diverse locations (UNESCO, 2021; Boateng, 2024). Another gap pertains to the roles of lecturers in the adoption of inclusive AI. Current research is primarily focused on the technologies themselves, overlooking how lecturers adapt them to accommodate diverse learners. Investigating lecturers' perspectives could shed light on how inclusive pedagogy evolves.

Boosting research productivity and discovery

The use of artificial intelligence is slowly transforming higher education research. It automates routine academic tasks and establishes novel knowledge-seeking opportunities, which is why it is convenient for early-career researchers and those operating in low-resource settings. The significant role that AI can play is in automating the time-consuming aspects of academic writing. Grammarly, QuillBot, and Turnitin are helpful applications for grammar checks, paraphrasing, and originality. Khalifa and Albadowy (2024) state that these tools make postgraduate students more productive and confident, especially those who speak non-English native languages, thus facilitating more equal scholarly participation.

LiteSmile presents another area where AI enhances literature discovery. Websites such as Semantic Scholar or Elicit apply NLP to discover relevant research, map citation networks, and summarise findings. Holmes et al. (2019) argue that the techniques accelerate the synthesis of knowledge and reveal multidisciplinary connections that would otherwise remain unknown. Another way AI is utilised is in translation and transcription software, enabling real-time communication on a global scale. Lestari et al. (2025) emphasise that AI-enhanced digital libraries can enhance access to academic resources, particularly for individuals in the Global South.

However, some of the studies are concerned with short-term efficiencies (quicker literature reviews or writing speed) and do not consider the impact of AI on long-term

critical thinking or methodological development (Merino-Campos, 2025). The effects of artificial intelligence on the autonomy, identity, and scholarly voice of academics are hardly understood. Moreover, some of the available studies were carried out in high-income countries. According to Boateng (2024), it is important to note that sub-Saharan African institutions are implementing AI; however, its applicability is often hindered by limited infrastructure. More area-specific studies should be conducted to better understand how AI adapts to low-bandwidth scenarios and regional research goals.

Strengthening student support and well-being

Artificial intelligence is being rapidly applied to enhance student support systems and promote well-being on campuses. With the growing need from institutions for personalised services, early intervention, and mental health care, AI tools are becoming more critical in providing student-centred support. Among the most promising AI applications are the early warning systems that detect students at risk of failing or dropping out. AI allows advisers to act proactively based on the patterns of attendance, assignment submission, and platform participation. In their view, Holmes et al. (2019) note that predictive technologies are changing universities towards proactive rather than reactive engagement, thereby improving retention and satisfaction levels.

Virtual assistants and AI chatbots are also widely deployed to answer repetitive questions and be available 24 hours to academically and administratively assist individuals. Shete et al. (2024) found that students prefer quick response times when obtaining information on registration, deadlines, and course materials rather than waiting during office hours. Such tools alleviate the burden on student affairs personnel and provide learners with regular guidance and support. Conversational experts in psychoeducation and mindfulness are being adopted in the field of mental health services. Lestari et al. (2025) argue that AI-based wellness technology has increased mental health assistance to students who are reluctant to engage in conventional counselling due to either stigma or a lack of access. Peer and community engagement are enhanced with the help of AI. Algorithms can be applied by learning management systems to suggest study groups, clubs, or co-curricular activities based on student interests and behaviours (Westman et al., 2021), which fosters a sense of belonging, in turn promoting persistence and well-being.

Amidst such changes, current studies, mostly from high-income countries, primarily focus on technological efficiency and customer satisfaction, providing limited data on the long-term impacts, such as academic resilience or mental development (Merino-Campos, 2025). Boateng (2024) claims that sub-Saharan African institutions use AI to support students insufficiently due to bandwidth limitations, technological shortcomings, and inadequate staff training. The role of academic personnel in AI-driven engagement is also insufficiently examined. Even though the technologies are automated, human judgement remains crucial. However, there is limited research available about educators' attitudes towards these technologies and their impact on teaching methods (UNESCO, 2021).

Threats of Artificial Intelligence in Higher Education

As artificial intelligence becomes increasingly integrated into higher education, its abilities are being examined. Although most of the debate centres on the positives of AI, emerging literature is cautious that, unless carefully regulated, its application can serve to erode

the very same goals that education attempts to realise. Undermining academic integrity, reinforcing algorithmic bias, and compromising data privacy are among the concerns with AI that have far-reaching implications, particularly in sub-Saharan Africa. In the following review, these concerns are critically studied based on available contemporary research studies.

Erosion of academic integrity and authenticity

Generative AI systems, such as ChatGPT and QuillBot, are putting into doubt many traditional beliefs about authorship, originality, and honesty in academic work. Hooda et al. (2022) found that generative AI can write coherent essays, paraphrase text, solve complex problems, and evade standard plagiarism detectors. While some students utilise AI to gain clarification on a topic, others employ it to bypass their intellectual contribution to the learning process, which poses significant questions on the authenticity of learning.

Abusive use, however, is not usually the consequence of dishonest behaviour. Eager and Brunton (2023) claim that students often overutilise AI due to time constraints, language barriers, and a lack of self-confidence. This diverts the attention of policing bad acts to the realisation that learning environments may not be meeting the requirements of students, thereby necessitating institutional accountability. Nevertheless, despite increased awareness, significant gaps remain. Most of the existing literature is reactive and focuses on detection or outright bans (Zawacki-Richter et al., 2019) instead of acknowledging the evolving relationship between students and AI. There is a lack of longitudinal research, and practically nothing is known about how students' ethical reasoning evolves within digitally mediated learning conditions (Holmes et al., 2019).

It is worth noting that the majority of studies come from high-income Western contexts. In sub-Saharan Africa, for example, distinct patterns of AI applications may be prompted by variables such as large class sizes, limited feedback, and resource constraints (Boateng, 2024). However, the voices from such an environment are not adequately represented. Little empirical work has also been done on educators' perceptions of the role of AI, i.e., whether it is a threat or a support tool. In sum, integrity issues associated with AI require more than detection. They require humanistic research-informed approaches that balance innovation with ethics.

Algorithmic bias and epistemic inequity

Although artificial intelligence has been recognised for enhancing fairness and effectiveness in higher education, most AI applications have inherent biases that can exacerbate existing differences. Such biases are most often generated not with a harmful intention but through the datasets and assumptions with which the AI is trained. A growing body of literature confirms that most AI systems are developed using data that mainly represents Western and English-speaking societies. Holmes et al. (2019) caution that this distorts the understanding of language, academic content, and behaviour by AI, potentially disadvantaging students with diverse cultural and linguistic backgrounds.

Vargas-Murillo et al. (2023) further submit that AI methods often amplify the existing academic narrative through popularising Western-centric and well-indexed sources, leading to a situation of epistemic narrowing where other voices are marginalised. These dangers are well-known, but empirical evidence is relatively scarce. Many of the

discourses are founded on theoretical frameworks rather than rigorous and systematic research (Zawacki-Richter et al., 2019). More research is needed to comprehend how AI influences learners in terms of socioeconomic, disciplinary, and linguistic differences.

Geographical variations aggravate the situation. The unadapted importation of AI-based systems into universities is observed in sub-Saharan Africa, Asia, and Latin America. Boateng (2024) warns that this enhances epistemic dependency, as most tools disregard local scholarship because it is underrepresented in databases. Owing to this, there is a risk that students may encounter knowledge that is not relevant to their context. In the meantime, owing to ineffective institutional control in many sub-Saharan African universities, AI tools are being applied without clear procedures for auditing the results. As recommended by Pedro (2020), sub-Saharan African universities should develop robust governance systems to assess AI applications and prevent the entrenchment of inequity.

Commodification of knowledge and epistemic dependence

As artificial intelligence begins to play a greater role in academic life, a significant yet understated issue related to its impact on how knowledge is produced and valued arises. Although AI tools offer a fast and effective way of accessing information, they also reveal more underlying issues concerning knowledge monetisation and our gradual tendency towards algorithmic mediation. Generative AI, such as ChatGPT, Elicit, and Scite, is widely valued for simplifying research tasks, including article summarisation or question generation. These efficiencies, however, are likely to shift the academic emphasis from deep participation to surface-level consumption. Holmes et al. (2019) issue a warning that the reliance on AI-produced information is likely to weaken essential academic abilities, such as critical thinking, originality and independent research.

Lestari et al. (2025) also note that although AI enhances access to scholarly databases, students often use such resources as a convenience tool rather than as an integral part of comprehensive research. The practice runs the risk of reducing learning to a mechanical process of inputs and outputs, thereby discounting the reflective and iterative processes that are integral to higher education. Another point of concern is the monopoly held by privately owned technology firms over commercial AI platforms. These platforms also control access, prioritisation and presentation of material. Pedro (2020) terms this the platformisation of education, where the students are turned into users and knowledge is filtered by obscure, efficiency-seeking algorithms. Such algorithms are often trained using information that is primarily based on Western cultures, which exacerbates epistemic injustices. Vargas-Murillo et al. (2023) caution that such dynamics lead to epistemic dependency, particularly in the Global South. Academics may also be compelled to align with mainstream paradigms, which often overlook or undervalue local knowledge systems and indigenous epistemologies. Consequently, there is little capacity to develop contextually relevant research topics.

In addition to the above fears, the impact of AI on academic identity and intellectual activity has received minimal empirical investigation (Zawacki-Richter et al., 2019). There is a dearth of related studies in the humanities and social sciences that require in-depth critical analysis. Institutional response is also inadequate. Few universities provide ethical guidelines or safeguards to ensure AI supports, rather than replaces, meaningful learning. In the absence of such frameworks, AI risks promoting passive consumption and

global knowledge hierarchies. Higher education institutions that want to preserve their transformative power should analyse the effects of AI critically and support thoughtful and diverse interaction with such tools.

Data privacy, consent, and surveillance

Amid the increasing adoption of artificial intelligence in higher education, concerns are arising over data privacy, consent, and surveillance in academic, administrative, and welfare systems. Much as AI systems offer significant benefits, such as personalised learning, early interventions, and predictive analytics, these benefits depend on large-scale data extraction that is often invisible to many users, creating transparency, autonomy, and trust issues between students and institutions. Many institutions are increasingly utilizing AI to track student behaviour across multiple platforms, including monitoring activity on Learning Management Systems (LMS), using biometric logins, and even deploying eye-tracking technology during examinations.

Howard et al. (2018) state that such information is utilised to predict performance, identify at-risk students, and improve service delivery. However, this increased datafication can quietly shift the ethos of education from one of student care to one of control, in which learners become data points rather than participants in their own education. Jokhan et al. (2022), writing from a Pacific setting, discuss how AI dashboards enable staff to support students more proactively by monitoring attendance, engagement, and grades. While this appears to be student-centred, it frequently assumes a trusting institutional climate and ignores the power imbalance, which means that students rarely know what data is gathered or how it is used. A primary ethical concern is the lack of genuine consent. When using platforms, students frequently accept vague, general privacy terms without knowing the scope or purpose of data collection. Pedro (2020) contends that this dents both data protection regulations and student urgency. The notion that efficiency justifies opaque surveillance is dangerous because it contradicts the participatory values of higher education.

Even more contentious is the rise of AI-based proctoring. Tools like ProctorU and Examity, which monitor eye movements, sounds, and facial expressions, have sparked widespread discomfort. Khalifa and Albadawy (2024) report that such systems often activate anxiety, misinterpret behaviour, and disadvantage students with disabilities or those lacking stable internet. In trying to detect dishonesty, these tools may unintentionally deepen existing inequities. Salido (2023) suggests that AI surveillance can be applied ethically if it is transparent and supported by institutional safeguards. However, few studies have examined how these precautions are applied, whether students can opt out, or how their concerns are addressed, indicating a considerable gap in current research. This disparity is particularly noticeable among sub-Saharan African students, who often share devices with inadequate data security. Vargas-Murillo et al. (2023) warn that AI imports that are not customised can promote surveillance exposure in these vulnerable contexts, exacerbating digital inequality.

Furthermore, AI systems are beginning to combine academic, administrative, and welfare data, drawing on grades, library check-ins, campus cards, and even social media. This hyper-integration might result in comprehensive student profiles that affect institutional decisions without sufficient transparency or accountability. Most worrying

is that student voices are lacking. Few studies have investigated students' attitudes towards data use, the kind of oversight they demand, or how they understand algorithmic judgements. As a result, AI governance remains top-down, with institutional efficiency preceding student rights. To summarise, AI's role in higher education must shift from passive observation to active, ethical involvement. It is not only about conforming to legislation; it is about incorporating consent, accountability, and humanity into all decisions. Educational data and the algorithms that drive it are not neutral. Institutions must ensure that AI promotes human dignity, not simply operational efficiency.

Dehumanisation of pedagogy and relational learning

The implementation of artificial intelligence has the potential to exacerbate existing inequities between institutions in high-income countries and those in the Global South that are underfunded. Instead of levelling the playing field, current AI integration may exacerbate the digital divide by widening gaps in research capabilities, teaching quality, and access to learning technologies. Well-funded institutions gain from modern infrastructure and the ability to apply artificial intelligence for grading, admissions, individualised learning, and administrative tasks. In contrast, many low-resource institutions lack reliable internet connectivity, up-to-date equipment, and qualified personnel to support such systems. As a result, teachers and students in these contexts often fall behind in terms of digital literacy and access to cutting-edge educational tools (Boateng, 2024).

Pedro (2020) correctly points out that AI is frequently described as globally revolutionary, yet its benefits are unequally dispersed. Universities in the Global South often rely on outdated technology or donor-funded experimental programs that hardly keep pace with the rapid progress of AI. These universities are late adopters and often excluded from influencing the development and control of AI tools. This inequity extends to teaching and learning. Wealthier institutions utilise AI-powered tutoring, adaptive courseware, and real-time analytics to personalise learning. In contrast, many in the Global South still employ chalk-and-talk approaches and lack access to fundamental digital content (UNESCO, 2021). In research, access to AI-supported tools for data analysis and manuscript writing is often institutionally restricted, significantly disadvantaging scholars in poorer universities (Zawacki-Richter et al., 2019).

Despite the urgency, actual studies into these institutional disparities are limited. Most studies examine national or regional trends, with minimal emphasis on disparities between rural and urban campuses or between public and private universities (Holmes et al., 2019). More targeted comparative studies are required to identify context-specific issues and inform equitable implementation solutions. Furthermore, global policy discussions often focus on elite institutions while overlooking the realities of smaller or underfunded universities. Boateng (2024) argues that genuine educational fairness requires investments in infrastructure, open-source technologies, capacity building, and inclusive policies. Without these, AI's transformative potential would most certainly remain concentrated in privileged academic environments, leaving others far behind.

Addressing AI threats in Sub-Saharan African Higher Education Institutions

Although artificial intelligence is rapidly gaining traction in higher education, sub-Saharan African universities face unique challenges due to inadequate infrastructure, lax

regulation, and a reliance on externally produced AI tools. Owing to a lack of local control, these institutions often rely on systems that they did not develop, thereby limiting their ability to manage associated risks. As a result, global AI governance models may not be applicable in their contexts. This section provides evidence-based, region-specific advice to ensure that AI solutions are tailored to the socio-technical and cultural conditions of sub-Saharan Africa.

Developing ethical and regulatory frameworks

Creating robust institutional governance frameworks will help mitigate AI-related risks. Scholars (Salido, 2023; Khalifa & Albada, 2024; Holmes et al., 2019) emphasise the need for AI ethics rules that focus on data protection, openness, and fairness. While several sub-Saharan African countries have national data privacy laws, university rules are rarely enforced. Institutions should establish or strengthen existing ethics committees to evaluate AI tools, particularly those that involve decisions related to surveillance and privacy, ensuring a thorough assessment of the potential risks and benefits. Pedro (2020) emphasises that many sub-Saharan African universities use AI technologies that are incompatible with their ideals. Thus, legal frameworks must be localised, drawing on global norms but accounting for Africa's linguistic variety, digital inequities, and informal learning methods.

Promoting critical AI literacy for students and staff

Several studies (e.g., Mugizi & Rwothumio, 2023; Vargas-Murillo et al., 2023; Jokhan et al., 2022) have shown the necessity of critical digital literacy in enabling people to interact responsibly with AI. Sub-Saharan African institutions should incorporate AI ethics, data rights, and algorithmic bias into their general education courses, as well as provide capacity-building workshops for academic and administrative staff. Digital literacy projects must be multilingual and culturally sensitive, taking into account differences in prior exposure to AI technologies. Faculty development programs should extend beyond tool training to incorporate critical reflection on the pedagogical and ethical aspects of AI, preparing educators to support informed use rather than passive adoption.

Rehumanising pedagogy in an AI-augmented environment

AI should serve to enhance, not replace, the relational aspect of teaching and learning. Lestari et al. (2025) advise universities in constrained environments to adopt a "human-plus-AI" model, where routine instructional tasks are automated, but mentorship, feedback, and ethical deliberation remain the domain of human educators. Salido (2023) similarly promotes the notion of AI as a "pedagogical co-pilot" with clear boundaries, thereby preserving the educator's role as a moral and intellectual guide. This principle is especially vital in sub-Saharan Africa, where face-to-face interactions and community-based mentorship often play critical roles in student engagement and retention. Institutions should resist pressures to use AI as a cost-cutting measure to reduce academic staff and instead view it as a resource to free educators for deeper, human-centred interactions.

Safeguarding epistemic diversity and knowledge sovereignty

One of the most overlooked risks of AI is the reinforcement of epistemic hierarchies. Holmes et al. (2019) and Vargas-Murillo et al. (2023) warn that many AI systems are taught

using Euro-American knowledge repositories, effectively marginalising indigenous African epistemologies. To counteract this, sub-Saharan universities should invest in digitising and incorporating African knowledge into databases used to train institutional AI systems. There is also a need to create open-source African AI tools and cooperate with local developers and academic networks to guarantee that AI promotes epistemic inclusion rather than colonial reproduction. University consortia and regional entities, such as the Inter-University Council for East Africa (IUCEA), can play important roles in promoting cross-institutional knowledge sharing and the development of contextually embedded AI tools.

Embedding transparent data practices and informed consent

Pedro (2020) and Khalifa and Albadawy (2024) note that in several sub-Saharan African universities, data is collected from students without satisfactory disclosure or consent. As AI tools progressively rely on behavioural and biometric data, the perils of unconsented surveillance and profiling rise significantly. Universities must develop clear data policies that prioritise transparency, purpose limitation, and student agency. Consent mechanisms should be revisable and language-accessible, allowing students to opt into specific data practices and revoke consent when desired. Importantly, universities must treat data privacy not merely as a legal matter but as a pedagogical responsibility, helping students comprehend how their data is used and why it matters.

Equity-oriented infrastructure development

Finally, AI interventions will be successful only if an inclusive digital infrastructure supports them. As Salido (2023) points out, unequal access to devices, reliable internet, and electricity remains a continuous impediment. Sub-Saharan universities must lobby for public investment in educational broadband and low-bandwidth AI tools that are available in rural and low-resource areas. Where commercial AI platforms are too expensive or unsuitable, universities should invest in open-source alternatives and work with regional universities to co-create tools that reflect shared ideals and linguistic realities. This not only lowers expenses but also promotes technological sovereignty.

Conclusion and Recommendations for Sub-Saharan African Higher Education

Artificial intelligence is no longer a distant concept in higher education; it is already changing the way institutions teach, assess, govern, and support students. As already noted, AI provides tremendous opportunities such as personalised learning, expanded access, enhanced research output, and strengthened student support systems. As such, AI technologies can help universities become more responsive, data-driven, and learner-centred.

However, along with these promises come grave and multifaceted risks. For example, AI jeopardises academic integrity, data privacy, epistemic diversity, and educational relationships. These challenges are not theoretical; they arise daily in digital classrooms and institutional systems. While many of these concerns are global, they are especially acute in sub-Saharan Africa, where universities essentially serve as passive consumers of AI technologies built abroad, with limited ability to adapt or regulate them effectively. AI is not a neutral tool because it embodies the values and assumptions of its creators. When implemented without reflection, it can reinforce the very inequalities

higher education aims to dismantle. Thus, the future of AI in academia must not be left solely to technocrats or private vendors. It must be contextually embedded, ethically governed, and co-created by those it affects most. Sub-Saharan African universities must respond quickly with specific solutions.

First, institutions require internal AI ethical rules and governance structures that draw on global standards while being grounded in local realities, including language diversity and infrastructure limitations.

Second, investments in digital and critical AI literacy are vital for both lecturers and students, as they encompass not only technical training but also instruction on the ethical, social, and political implications of AI.

Third, AI should supplement, not replace, human relationships in learning. The educator's role as a mentor and ethical leader must remain vital.

Fourth, universities should contribute to the development and training of AI systems based on African knowledge to reduce epistemic dependency and encourage meaningful local research.

Fifth, transparent data governance, particularly in terms of permission and privacy, must be institutionalised.

Finally, governments and higher education institutions must commit to enhancing digital infrastructure and delivering affordable, open-source, bandwidth-sensitive AI solutions that correspond with African educational aims. Ultimately, this review advocates for a shift in institutional posture: from one of excitement to critical engagement, from adoption to adaptation, and a focus on efficiency to one on equity. For sub-Saharan Africa, the issue is not just keeping up with global advances but also adapting them to reflect the region's distinct knowledge systems, values, and goals.

Suggestions for Future Research

While this narrative review synthesises current knowledge on the benefits, threats, and mitigation strategies of AI in higher education, it also identifies several critical research gaps that future scholarship must urgently address, particularly in sub-Saharan Africa.

First, there is an urgent need for empirical research into the real-world application of AI tools in universities. The existing literature primarily focuses on high-income countries, providing limited insight into how AI functions in resource-constrained, multilingual, and fragmented policy environments. Future studies should focus on adoption patterns, institutional reactions, and lived experiences at sub-Saharan African higher education institutions, particularly those in rural areas or with limited resources.

Second, while the pedagogical benefits of AI are frequently highlighted, less is known about its long-term impact on teacher identity, student agency, and the relational components of learning. Qualitative approaches, such as ethnographic or phenomenological research, may shed light on how AI is altering the emotional, ethical, and cognitive dynamics of classroom life.

Third, the focus of research should be on the epistemic implications of AI in sub-Saharan African contexts. Imported AI systems frequently prioritise Eurocentric knowledge frames, potentially undermining African intellectual traditions. Comparative

research on local knowledge representation in AI-powered platforms, digital libraries, and automated assessments would be highly beneficial.

Fourth, there is a methodological need for more multidisciplinary and mixed-methods research that connects educational research to data science, ethics, and policy. The impact of AI on education is too complex to be fully understood within disciplinary silos.

Fifth, student voices, particularly those of marginalised groups like rural learners and those with disabilities, are underrepresented in current AI literature. These perspectives should be fundamental to future research agendas.

Finally, further research is needed on AI governance in sub-Saharan African higher education. Ethical, inclusive, and locally relevant AI policies that take into account universities' large enrolment, limited finances, and inconsistent connectivity are in higher demand than ever before. In short, the future of AI in sub-Saharan African higher education must be influenced not only by technological potential but also by empirical, context-aware, and ethically engaged research.

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