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# Artificial Intelligence in Higher Education: A Thematic Integrative Review of Applications, Users, Ethics, and Institutional Consequences

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## ABSTRACT

The rapid diffusion of artificial intelligence (AI) across higher education has intensified debates regarding its pedagogical value, ethical implications, and institutional governance. Although a growing body of research documents specific AI-driven applications, less attention has been paid to who uses AI in higher education, for what purposes, under what ethical conditions, and with what institutional consequences. This study adopts a thematic integrative literature review to synthesise peer-reviewed research and policy literature on AI use in higher education published between 2011 and 2025. Guided by six analytical questions, the review examines key actors, dominant AI platforms and applications, purposes of use, ethical practices, existing ethical guidelines, and persistent research gaps across teaching and learning, assessment, research, administration, and student support. The findings reveal uneven and stratified patterns of AI adoption, with students and academic staff emerging as the dominant users, growing reliance on generative AI tools, fragmented ethical governance, and limited institutional readiness. Building on these insights, the study advances a conceptual framework that conceptualises AI use in higher education as a socio-technical process shaped by institutional actors, ethical principles, and governance mechanisms. The review concludes by identifying critical gaps in empirical evidence, ethical implementation, and Global South-focused research, and outlines implications for future scholarship, policy, and institutional practice.

## 1. Introduction

Recent scholarship highlights that the emergence of generative Artificial intelligence (AI) has triggered an unprecedented transformation in higher education, with rapid growth in research output and institutional

experimentation (Ng & Ho, 2025; Qian, 2025). AI has therefore become a transformative force in higher education, reshaping teaching, learning, assessment, research, and institutional governance (Jensen et al., 2024). Advances in machine learning, natural language processing, and generative AI have enabled new forms of personalization, automation, and knowledge production (Bond et al., 2021; Quandt, 2022). Universities globally are increasingly adopting AI-driven tools to enhance efficiency and learning outcomes, yet these developments raise critical concerns about academic integrity, equity, and governance (Selwyn, 2019; Williamson & Eynon, 2020).

Recent breakthroughs in generative AI, particularly large language models, have accelerated adoption beyond institutional systems into everyday academic practices (Kasneci et al., 2023; Al-Omouh, Garrido, & Canero, 2023). Students frequently use AI tools for writing, problem-solving, and exam preparation, while academic staff increasingly rely on AI for feedback, content creation, and research support (Dwivedi et al., 2023). This rapid uptake has blurred boundaries between legitimate and illegitimate academic practices, challenging traditional assessment models and institutional norms. At the same time, scholars caution that adoption is uneven and shaped by trust, institutional readiness, and socio-cultural factors (Lelescu et al., 2025). Empirical studies further indicate that students' perceptions of AI vary significantly across demographic groups, raising concerns about equity and access (Maxwell et al., 2025).

Despite the growing literature, research remains fragmented and often technology-centric, focusing on specific tools rather than broader socio-institutional dynamics (Zawacki-Richter et al., 2019; Bond et al., 2021). Ethical discussions frequently remain abstract, with limited empirical examination of how ethical principles are operationalized in practice (Marín et al., 2025). Furthermore, Global South contexts remain underrepresented, despite facing distinct infrastructural, regulatory, and capacity-related challenges (Tsai, Ku, & Campbell, 2021).

In Botswana and similar contexts, AI adoption is shaped by digital inequalities, limited infrastructure, and emerging governance frameworks (Chuma & Lekoko, 2022; Moswela & Pule, 2021). These contextual realities necessitate a socio-technical perspective that situates AI within institutional, cultural, and policy environments.

This study addresses these gaps through six guiding questions:

1. Who is using AI in higher education?
2. Which AI platforms are most used?
3. What purposes do these platforms serve?
4. Is current AI use ethical?
5. What governance frameworks exist?
6. What research gaps remain?

By synthesizing existing research across these dimensions, the study makes three contributions. First, it provides an integrated overview of AI use in higher education that moves beyond isolated applications to consider institutional actors and practices. Second, it critically examines the ethical and governance landscape surrounding AI, highlighting tensions between innovation and regulation. Third, it proposes a conceptual framework that situates AI use within broader institutional and ethical contexts, offering a foundation for future empirical research.

The next section outlines the methodological approach to the literature review. This is followed by the presentation of findings, organized around the six guiding questions. The discussion section interprets these

findings in relation to existing debates in higher education research and introduces the conceptual framework. The paper concludes by identifying implications for policy, practice, and future research.

## 2.0 Methodology

This study adopted a **thematic integrative literature review approach** (Torraco, 2016), informed by systematic review principles, to synthesise empirical, conceptual, and policy-oriented research on artificial intelligence use in higher education. The review focused on peer-reviewed journal articles, reports from international organizations, and policy documents published between 2011 and 2025. Databases searched included Scopus, Web of Science, ERIC, and Google Scholar, using keywords such as “artificial intelligence,” “higher education,” “learning analytics,” “generative AI,” “academic integrity,” “ethics,” and “Botswana.”

### 2.1 Inclusion criteria

- studies explicitly addressing AI applications in higher education
- research examining actors, platforms, purposes, or ethical governance
- publications in English

### 2.2 Exclusion criteria

- studies that focused solely on K-12 contexts
- purely technical AI development without educational application
- or non-peer-reviewed blogs and opinion pieces

The selected studies were coded thematically according to the six guiding research questions. Themes included actors and users of AI, AI platforms and applications, purposes of use, ethical considerations, policy and governance frameworks, and research gaps. Findings were synthesized narratively and organized to reflect patterns across institutional, disciplinary, and geographical contexts.

## 3.0 Results Analysis

### 3.1 Actors in Higher Education and Patterns of AI Use

The reviewed literature indicates that the use of artificial intelligence in higher education is highly differentiated across institutional actors, reflecting variations in power, responsibility, and exposure to risk. Students emerge as the most extensive and frequent users of AI technologies (Cotton et al., 2023; Al-Omouh, Garrido, & Canero, 2023), particularly generative AI tools, which are commonly employed for academic writing, revision, problem-solving, and exam preparation (Bin Jwair, 2025; Maxwell et al., 2025). Student use is largely informal and self-directed, often occurring outside formal institutional guidance or regulation (Dhara, Chatterjee, Chaudhuri, Goswami, & Ghosh, 2022; Kasneci, Slootmaker, Molinari, Kasneci, & von der Malsburg, 2023).

Academic staff demonstrate more selective and cautious engagement with AI (Bond et al., 2021; Marín et al., 2025). While lecturers and researchers increasingly use AI to support content development, feedback generation, and research activities, adoption is frequently mediated by concerns related to academic integrity, professional identity, and pedagogical legitimacy (Bond, Marin, Dolch, Bedenlier, & Zawacki-Richter, 2021; Lelescu et al., 2025). Faculty use is therefore more fragmented and discipline-dependent than student use.

At the institutional level, administrators and senior managers primarily engage with AI through analytics-driven and decision-support systems (Williamson & Eynon, 2020). These applications focus on enrolment management, student retention, quality assurance, and operational efficiency (Siemens & Long, 2011). Support services, including libraries and student affairs units, utilise AI mainly through chatbots and recommender systems to improve service accessibility and scalability.

Collectively, these findings suggest that AI use in higher education is not uniform but stratified, with students often operating at the margins of governance structures while institutions retain control over high-stakes, analytics-based systems.

### 3.2 AI Technologies Adopted Across Institutional Contexts

Across the reviewed literature, generative AI systems represent the most pervasive category of AI technologies in higher education (Dwivedi et al., 2023; Ng & Ho, 2025; Qian, 2025). Their rapid diffusion is attributed to accessibility, ease of use, and multifunctionality, enabling application across a wide range of academic tasks (Kasneji, Slootmaker, Molinari, Kasneji, & von der Malsburg, 2023). Unlike earlier educational technologies, generative AI tools are not confined to institutional platforms, allowing students and staff to adopt them independently of formal approval processes.

Learning analytics and predictive systems constitute a second major category, typically embedded within learning management systems and institutional infrastructures. These technologies are used to monitor student engagement, predict academic risk, and inform targeted interventions (Siemens & Long, 2011; Viberg et al., 2018). Intelligent tutoring systems and adaptive learning platforms are more prevalent in STEM disciplines, where structured problem-solving lends itself to algorithmic personalization (Holmes, Bialik, & Fadel, 2019).

Administrative and decision-support AI systems are less visible to students but play an increasingly significant role in governance and management. The findings indicate a clear functional distinction between AI technologies that are user-facing and those that are institutionally controlled, with implications for transparency and accountability.

Emerging tools include AI chatbots, adaptive learning systems, and automated grading technologies (Zhai et al., 2021).

### 3.3 Domains of AI Use in Higher Education

The literature identifies multiple domains in which AI is embedded within higher education practices. Generative AI is not only supporting traditional domains such as teaching and assessment but is also redefining academic practices by enabling new forms of knowledge production and collaboration (Jensen et al., 2024; Yusuf et al., 2024).

In teaching and learning, AI is widely used to personalize content delivery, provide immediate feedback, and support self-paced study (Holmes et al., 2019; Zhai et al., 2021). While studies report increased engagement and perceived learning support, evidence of sustained learning gains remains mixed (Holmes, Bialik, & Fadel, 2019).

Assessment and feedback emerge as particularly contested domains. AI is used for automated grading, plagiarism detection, and feedback generation, raising concerns about assessment validity and the erosion of authentic student work. The literature suggests that AI challenges traditional assessment models predicated on individual authorship and unaided performance (Dhara, Chatterjee, Chaudhuri, Goswami, & Ghosh, 2022).

In research and knowledge production, AI supports literature synthesis, data analysis, and manuscript drafting (Dwivedi et al., 2023). These applications have altered academic workflows and blurred boundaries between human and machine contribution, prompting debates about authorship, originality, and scholarly credit (Kasneci, Sloomaker, Molinari, Kasneci, & von der Malsburg, 2023).

AI is also used to support student retention and wellbeing through predictive analytics, while institutional governance applications focus on strategic planning and quality assurance (Williamson & Eynon, 2020). Together, these findings demonstrate that AI use is no longer peripheral but increasingly embedded within the core academic and administrative functions of higher education institutions.

#### 3.4 Educational and Institutional Outcomes of AI Use

The reviewed studies report a range of educational and institutional outcomes, both positive and negative, associated with AI adoption. Positive outcomes include enhanced efficiency, increased access to learning support, and improved institutional decision-making (UNESCO, 2023; Zawacki-Richter et al., 2019). AI-enabled tools are particularly valued for their capacity to provide scalable, timely assistance in resource-constrained environments.

However, the literature also highlights significant unintended consequences. Academic integrity concerns are pervasive, with AI-assisted cheating and ghost-writing challenging existing regulatory frameworks. Equity concerns arise from differential access to AI tools and varying levels of digital literacy, potentially exacerbating existing inequalities (UNESCO, 2023; Maxwele et al., 2025).

At the institutional level, reliance on algorithmic systems introduces risks related to data privacy, surveillance, and bias, particularly when AI systems influence high-stakes decisions such as admissions or progression (Marino et al., 2024; Quandt, 2022).

Global inequalities are amplified, particularly in resource-constrained contexts (Tsai, Ku, & Campbell, 2021). These outcomes underscore the dual nature of AI as both an enabling and destabilising force within higher education. Consequently, there remains a need for the ongoing critical evaluation of long-term educational outcomes (Ng & Ho, 2025).

#### 3.5 Ethical and Governance Contexts Shaping AI Use

Ethical considerations emerge as a central moderating factor shaping AI use across all domains, particularly among educators (Lelescu et al., 2025). Studies also emphasize the growing tension between innovation and academic integrity, with AI simultaneously viewed as a threat and an opportunity for educational reform (Yusuf et al., 2024). The literature consistently identifies academic integrity, data privacy, algorithmic bias, transparency, and equity as core ethical challenges (Floridi, et al., 2018; UNESCO, 2021).

While international frameworks such as UNESCO’s Recommendation on the Ethics of Artificial Intelligence and the OECD AI Principles provide normative guidance, the findings reveal a persistent gap between ethical principles and institutional practice (Marín et. al., 2025). Many universities have adopted policy statements on AI use, yet enforcement mechanisms, staff training, and student engagement remain uneven (UNESCO, 2023).

Importantly, ethical governance is often reactive rather than anticipatory, responding to emergent challenges posed by generative AI rather than proactively shaping responsible use. This misalignment contributes to uncertainty among staff and students and undermines consistent ethical practice. Recent studies emphasize the need for proactive governance, integrating ethics into curriculum, policy, and institutional strategy (Al-Omouh, Garrido, & Canero, 2023; Dwivedi et al., 2023).

### 3.6 Conceptual Framework

The study proposes a conceptual framework positioning AI use in higher education as a socio-technical process moderated by ethical and governance mechanisms. The framework identifies three core components:

1. Actors in Higher Education: students, academic staff, institutional administrators, and support units.
2. AI Technologies and Applications: generative AI, learning analytics, adaptive tutoring, decision-support systems.
3. Domains of Use: teaching and learning, assessment, research, student support, and governance.

These are depicted in Figure 1 below.

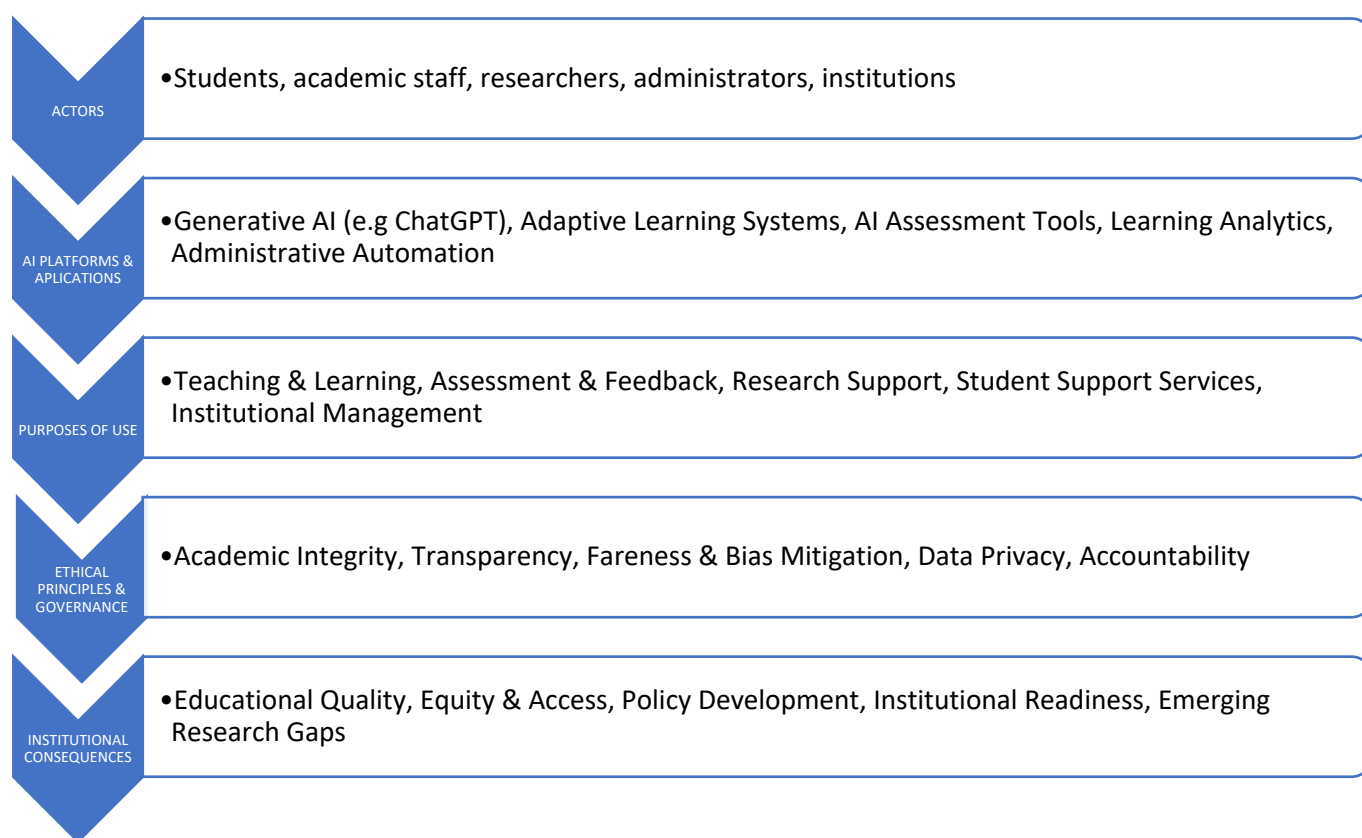


Figure 1. Conceptual framework of AI use in higher education as a socio-technical process.

These components interact to produce educational and institutional outcomes, including enhanced efficiency, personalized learning, and potential ethical risks (academic integrity, equity, data privacy). Ethical principles and governance frameworks act as moderators, shaping adoption, implementation, and responsible use.

## **4.0 Discussion**

### **4.1 AI Use as a Socio-Technical Practice**

Interpreted through a socio-technical lens, the findings demonstrate that AI use in higher education is shaped by the interaction between technological affordances and institutional contexts (Williamson & Eynon, 2020). Adoption patterns reflect existing power relations, disciplinary norms, and governance structures rather than purely rational evaluations of utility. Students' rapid uptake of generative AI contrasts sharply with institutional caution, highlighting divergent risk perceptions and accountability burdens.

### **4.2 Adoption, Acceptance, and Resistance in Higher Education**

The differential adoption of AI aligns with technology acceptance theories, particularly regarding perceived usefulness and perceived risk. Students prioritize efficiency and performance gains, while academic staff weigh potential benefits against reputational and ethical risks. Institutional actors exhibit the highest levels of resistance, reflecting concerns about liability, regulatory compliance, and public trust (Dwivedi et al., 2023).

These dynamics suggest that resistance to AI should not be interpreted as technological conservatism but as a rational response to unresolved governance and ethical challenges.

### **4.3 Ethics as Institutional Governance Rather Than Compliance**

A key contribution of this study is the reconceptualisation of AI ethics as a form of institutional governance rather than a matter of individual compliance (Marín et al., 2025). Ethical AI use requires not only policy articulation but also organisational capacity, professional development, and participatory engagement with students and staff.

The findings indicate that policy-driven approaches alone are insufficient. Without alignment between ethical frameworks, assessment design, and pedagogical practice, institutions risk symbolic compliance rather than meaningful ethical governance.

### **4.4 Implications for Higher Education Policy and Practice**

The findings have several implications for higher education. First, institutions must move beyond prohibition-based responses and invest in AI literacy for both staff and students. Second, assessment practices require redesign to prioritize higher-order thinking, process-oriented evaluation, and authentic learning tasks. Third, governance frameworks must address equity, transparency, and accountability in both pedagogical and administrative AI systems.

For under-researched contexts, particularly in the Global South, these implications are amplified by infrastructural constraints and regulatory gaps, underscoring the need for context-sensitive approaches to AI governance (Tsai, Ku, & Campbell, 2021).

### **4.5 Conceptual Frameworks on AI in Education/Higher Education**

Existing conceptual frameworks on artificial intelligence (AI) in higher education have largely concentrated on discrete dimensions of AI adoption, often emphasizing technological capabilities or pedagogical applications. For example, early models of AI in education focused primarily on intelligent tutoring systems, adaptive learning,

and learning analytics, foregrounding instructional design and learner outcomes (Holmes, Bialik, & Fadel, 2019; Luckin & Holmes, 2016). Similarly, large-scale reviews such as Zawacki-Richter et al. (2019) mapped the landscape of AI applications and actors but stopped short of integrating ethical governance and institutional consequences into a unified explanatory model.

More recent scholarship has expanded the focus to include ethical concerns such as transparency, bias, accountability, and academic integrity (Selwyn, 2019; UNESCO, 2021). However, these frameworks often present ethical principles at a normative level without explicitly situating them within the operational realities of higher education institutions. As a result, governance mechanisms are frequently conceptualized as external guidelines rather than as embedded mediators shaping AI use and outcomes.

The conceptual framework proposed in this study extends existing models in three key ways. First, it adopts a socio-technical perspective that explicitly links institutional actors (students, academics, administrators) to AI platforms and specific purposes of use. Second, it positions ethical principles and governance structures as mediating mechanisms that directly influence institutional consequences, rather than as peripheral considerations. Third, it incorporates institutional outcomes, including educational quality, equity, policy development, and research gaps, thereby moving beyond descriptive mapping toward systemic analysis.

By integrating actors, technologies, purposes, ethics, and consequences within a single model, the framework offers a more comprehensive representation of AI use in higher education. In doing so, it responds to calls for integrative and governance-sensitive approaches to educational technology research and provides a foundation for future empirical investigation, particularly in underrepresented Global South contexts.

#### 4.5 Future Research Directions

This study identifies several directions for future research, including longitudinal studies on learning outcomes, empirical evaluation of ethical guidelines, and comparative research across institutional and national contexts. Greater attention is needed to staff professional development, student ethical reasoning, and assessment innovation in AI-rich environments.

### 5.0 Conclusion

This study demonstrates that the use of artificial intelligence in higher education is more appropriately understood as a socio-technical and governance challenge rather than a purely technological advancement. While AI presents substantial opportunities to enhance learning experiences, improve institutional efficiency, and expand access to educational resources, its integration simultaneously introduces complex ethical, pedagogical, and organisational considerations.

From a practical standpoint, the findings suggest that higher education institutions must move beyond ad hoc or reactive approaches to AI adoption and instead implement structured, institution-wide strategies. This includes embedding AI literacy within curricula and professional development programmes, redesigning assessment practices to emphasise critical thinking and process-oriented learning, and establishing clear, enforceable policies that guide responsible AI use among students and staff. Furthermore, institutions should invest in transparent and accountable governance frameworks that address data privacy, algorithmic bias, and equity, particularly in decision-making systems.

The study also highlights the importance of contextualising AI implementation within specific institutional and regional realities. In resource-constrained environments, practical applications should prioritise scalable and inclusive AI solutions that do not exacerbate existing inequalities. Collaborative approaches involving policymakers, educators, students, and technology developers are essential to ensure that AI integration aligns with educational values and societal needs.

Ultimately, addressing the challenges associated with AI in higher education requires coordinated governance, sustained ethical capacity-building, and ongoing empirical research. Such efforts are critical to ensuring that AI is deployed in ways that uphold academic integrity, promote equitable access, and support the core educational mission of universities.

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### **Declaration of Conflicting Interests**

The corresponding author, Dr Pearson Chaurura, wishes to divulge that he occasionally serves as a reviewer for IJABS.

### **Statement on AI Use**

The author(s) declare that this work was prepared independently and that no AI-based applications or tools were used to generate any part of the manuscript.

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