Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.16, No.7, 2025

Teaching Artificial Intelligence and Teaching with Artificial Intelligence in South African Higher Education Institutions

Mahlatse Ragolane,
Doctoral Researcher, Regent Business School, Auckland Park, Johannesburg, South Africa, Email: Mahlatse.ragolane@regent.ac.za
ORCID ID: https://orcid.org/0000-0002-1889-7616

ABSTRACT

This article explores the dual dimensions of Artificial Intelligence (AI) in South African higher education: as a subject of instruction and as a pedagogical tool transforming teaching and learning practices. On the one hand, higher education institutions are increasingly embedding AI into academic programmes to meet the growing demand for digital and data-driven skills. However, the expansion of AI education is constrained by infrastructural disparities, limited staff capacity, and uneven institutional readiness, particularly among historically disadvantaged universities. On the other hand, educators are beginning to adopt generative AI tools such as ChatGPT and automated grading systems to support assessment, feedback, and instructional design. While these technologies offer opportunities for enhanced efficiency and personalisation, they also raise ethical concerns, including data privacy, academic integrity, and the risk of deepening digital divides. Drawing on a qualitative synthesis of scholarly literature, this study applies the Technology Acceptance Model (TAM) to critically analyse AI's pedagogical integration. The findings highlight a need for professional development, inclusive policy frameworks and contextually relevant strategies to ensure AI contributes to equitable and transformative higher education. The article concludes with recommendations for policymakers, educators and institutions seeking to responsibly harness AI's potential.

KEYWORDS: Artificial Intelligence, Higher Education, South Africa, Pedagogy, Digital Transformation

DOI: 10.7176/JEP/16-7-10

Publication date: July 30th 2025

1. INTRODUCTION

Artificial Intelligence (AI) is no longer a futuristic concept; it is an integral component of the digital landscape, shaping industries, governance, and education globally. In the realm of higher education, AI's influence is twofold: it is both a subject to be taught and a tool with which to teach (*see* Luo, Zheng, Yin & Tao, 2025). This dual role has significant implications for universities, educators, and students alike, particularly within the South African context, where systemic inequalities and digital divides persist. The acceleration of generative AI technologies, particularly since the public release of ChatGPT in late 2022, has catalysed pedagogical, curricular, and ethical reconsiderations in institutions worldwide, including in South Africa (Lee *et al.,* 2024). Globally, the discourse around AI in higher education is expanding, as universities grapple with the possibilities and pitfalls of integrating AI into academic life. On one hand, AI has become a critical subject of study, essential for preparing students for evolving labour markets. On the other hand, it is reshaping instructional practices, enabling educators to use tools for adaptive learning, automated assessment, and content generation (Maphalala & Ajani, 2025). However, this transformation is neither linear nor uniformly experienced across global regions. In the South African higher education system, longstanding challenges such as resource scarcity, infrastructural disparities, and pedagogical diversity influence how AI is both taught and employed (Segooa, Modiba & Motjolopane, 2025).

Teaching AI as a discipline involves the design and delivery of curricula that encompass machine learning, natural language processing, computer vision and ethical frameworks. The inclusion of AI in higher education is a response to global labour demands and national policy imperatives for digital skills development. South African institutions such as the University of Cape Town, Stellenbosch University, and the University of Johannesburg have begun integrating AI-focused modules into ICT, engineering, and even humanities curricula. However, not all institutions are equally resourced to offer such programmes. As a result, AI education risks becoming a domain limited to well-funded institutions, potentially exacerbating digital and economic inequalities among graduates (Ayanwale *et al.,* 2022). Moreover, educators themselves face barriers in teaching AI. Many academics lack formal training in AI or machine learning, and institutional support for upskilling is

often limited. As Ayanwale *et al.* (2022) note, teacher readiness and confidence significantly shape the success of AI education initiatives. In South Africa, where professional development is unevenly distributed and often underfunded, the challenge of preparing faculty to teach AI content remains significant. The issue is compounded by the interdisciplinary nature of AI, which demands that lecturers navigate technical, ethical and social dimensions simultaneously. Pedagogically, the teaching of AI must also be attuned to critical and contextual perspectives. The decolonisation of curricula, a central concern in post-apartheid South African education, requires that AI education not only teach technical skills but also interrogate how AI reproduces power structures, biases, and epistemic exclusions. Scholars such as Bozkurt et al. (2023) have emphasised that AI's transformative potential in education can be both emancipatory and hegemonic, depending on its application and framing.

Parallel to the integration of AI as a subject is the increasing use of AI tools in teaching and learning. Generative AI technologies such as ChatGPT, DALL-E and Grammarly have become widely accessible to both students and educators. In the South African context, some institutions have begun to pilot AI-supported learning platforms for personalised tutoring, formative feedback, and academic writing support (Segooa *et al.,* 2025). The ResearchBuddie artefact, for example, was designed to assist postgraduate students and their supervisors in managing the research process through AI-enabled functions such as proposal development, literature review assistance, and academic language refinement. AI tools also promise to enhance pedagogical efficiency. Educators can use AI to automate administrative tasks, generate quizzes, analyse student performance, and even draft teaching materials. This shift towards automation has sparked optimism for reducing academic workload and increasing teaching effectiveness (Reina Marín *et al.,* 2025). Yet, these developments are accompanied by significant concerns regarding academic integrity, algorithmic bias, and the erosion of human-centred teaching values.

The perception of AI tools remains ambivalent among faculty and students. According to a multi-institutional survey, 71.5% of students and 73.1% of professors expressed scepticism regarding the efficacy of AI in enhancing education, despite recognising its inevitability (Reina Marín *et al.,* 2025). South African educators, particularly those at institutions serving historically marginalised communities, have raised questions about the relevance and accessibility of these tools, especially in contexts where internet access and digital infrastructure remain unreliable. Additionally, the ethical dimensions of teaching *with* AI warrant critical scrutiny. Issues such as data privacy, surveillance, and the potential for AI to reinforce existing social inequalities have prompted calls for more inclusive and reflexive implementation strategies (Bond *et al.,* 2024). In response, scholars have urged universities to develop clear policies, offer professional training, and establish ethical frameworks for AI integration.

A conceptual and practical synergy between *"teaching AI"* and *"teaching with AI"* is essential for creating a resilient and forward-looking higher education system. This integration should not be seen merely as a technological or curricular innovation, but as a transformation of the educational paradigm itself (Imran *et al.,* 2024). For South African higher education institutions, this requires moving beyond fragmented adoption to a strategic vision that aligns AI with broader goals of equity, access and relevance. A systems approach is needed to ensure that AI literacy is democratised and that all students, regardless of their institutional affiliation or socio-economic background, have the opportunity to engage critically and creatively with AI. This includes embedding AI ethics and policy debates into courses, fostering interdisciplinary collaboration, and creating participatory spaces where students and staff co-design the role of AI in education (Crompton & Burke, 2023).

2. LITERATURE REVIEW

2.1. Teaching Artificial Intelligence in Higher Education

Artificial Intelligence (AI) has rapidly evolved from a niche technological interest into a critical area of academic inquiry and professional skill development. Globally, the teaching of AI in higher education has intensified, propelled by the increasing demand for data science, machine learning, and automation skills in the digital economy. In South Africa, the integration of AI into university curricula reflects both the influence of global trends and the pressures of local developmental challenges. However, this integration remains uneven, constrained by institutional disparities, limited educator capacity, and systemic inequities rooted in the country's historical and socio-economic context. Internationally, universities have expanded their offerings of AI-related modules, with a shift from computer science departments alone to interdisciplinary AI education encompassing engineering, health sciences, business, and education. Crompton and Burke (2023) observe a significant rise in AI education research between 2016 and 2022, with undergraduate students being the most studied group and language learning emerging as a dominant application domain. Moreover, new AI curricula now include ethical,

philosophical, and sociotechnical dimensions, reflecting growing concern with the implications of algorithmic decision-making and data governance. AI is increasingly taught not just as a technical skillset but as a foundational literacy in navigating the contemporary world. This has led to the emergence of AI ethics, explainability, and fairness as key curricular themes in many institutions (Bozkurt, 2023). Such developments signal a paradigm shift from training AI developers to cultivating AI-literate citizens.

In South Africa, universities have responded to AI's global ascendancy with a mixture of innovation and caution. Institutions like the University of Cape Town, Stellenbosch University, and the University of Johannesburg have introduced AI modules in computer science, data analytics, and business degrees. Additionally, there have been initiatives to incorporate AI within broader Fourth Industrial Revolution (4IR) strategies, following national imperatives set out by the Presidential Commission on the Fourth Industrial Revolution (PC4IR) (Kajiita & Kang'ethe, 2025). Yet, the landscape is far from uniform. As Segooa, Modiba, and Motjolopane (2025) argue, disparities in institutional capacity result in uneven access to AI education, with historically disadvantaged universities (HDUs) facing infrastructural, financial, and staffing constraints. These challenges reflect broader digital divides in South African higher education, where legacy inequalities from apartheid-era spatial and economic planning continue to shape resource distribution and technological access. Many universities lack the computational infrastructure, licensed software, and trained faculty required to teach AI effectively. Even where curricular frameworks exist, the implementation often falters due to inconsistent Wi-Fi access, limited access to laboratories, and reliance on externally funded short-term projects (Maphalala & Ajani, 2025).

To this end, efforts to integrate AI into South African higher education curricula have been influenced by both external collaboration and internal initiatives. Government documents such as the National Digital and Future Skills Strategy (Department of Communications and Digital Technologies, 2020) advocate for the development of AI-related competencies across all education levels. This has provided impetus for universities to revise existing programmes and introduce new degrees or diplomas focused on AI, robotics, and data science. However, institutional readiness remains a central concern. In a study examining AI education uptake, Kajiita and Kang'ethe (2025) identified supportive policy environments, such as the Windhoek Statement on AI and the Protection of Personal Information Act (POPIA) Act No. 4 of 2013, as accelerators of adoption. Yet they also noted inhibitors such as ethical concerns, lack of confidence among faculty, and insufficient datasets relevant to the South African context. These limitations hinder the full realisation of AI curricula, particularly in disciplines that require localised data or language processing capabilities.

In essence, teaching AI requires not only appropriate infrastructure but also faculty with relevant technical expertise and pedagogical support. Many South African educators, particularly outside engineering and computer science, lack formal training in AI or machine learning. This undermines the depth and quality of instruction and limits the extent to which AI can be taught as an interdisciplinary subject. Ayanwale *et al.* (2022) found that teacher readiness and professional intention play a critical role in the adoption of AI education. Their study showed that despite a generally positive attitude toward AI, many educators feel underprepared and unsupported in integrating AI concepts into their teaching. This issue is especially pronounced in universities of technology and rural-based institutions, where digital skill development has lagged behind urban counterparts. To address this, there have been calls for targeted professional development programmes and communities of practice that support continuous learning in AI education. However, the availability and sustainability of such initiatives depend heavily on external funding, often leaving them vulnerable to disruption once donor cycles end.

Teaching AI in higher education should not be confined to technical skills. Scholars have increasingly advocated for a critical pedagogy of AI, one that interrogates the sociopolitical, ethical, and cultural implications of algorithmic systems (Mpungose, 2020; Le Grange, 2016). This aligns with Cukurova (2025), who propose a critical framework that situates AI at the intersection of learning analytics, pedagogy, and ethical decision-making, warning that unexamined deployment may entrench existing biases. In South Africa, this intersects with broader debates about curriculum decolonisation, linguistic diversity, and epistemic justice. Integrating AI into higher education curricula must account for the complex histories and positionalities of South African students. For instance, teaching AI ethics in a country marked by surveillance, inequality, and algorithmic bias requires localised case studies and participatory learning models that engage students not only as learners but as co-creators of technological futures. Local innovations such as the Bhala project, a multilingual AI-driven keyboard designed for African languages, demonstrate how AI teaching can align with contextual relevance and cultural inclusivity (Khoalenyane & Ajani, 2024). However, such initiatives remain rare and often unsupported at scale.

2.2. Teaching *with* Artificial Intelligence

The integration of Artificial Intelligence (AI) into higher education is redefining teaching practices, with AI increasingly deployed as a pedagogical assistant rather than solely a subject of study. Teaching *with* AI refers to

the use of intelligent systems and generative technologies to support or augment the instructional process. Globally, this trend has gained momentum with the rapid development of generative AI models such as ChatGPT, which are capable of producing human-like text, assisting in writing, tutoring, assessment, and feedback. In South African universities, this shift is beginning to manifest in various contexts, but its implementation remains uneven and shaped by structural, pedagogical, and ethical concerns. South African institutions have begun to experiment with AI tools to assist educators in managing growing workloads, personalising learning, and addressing student engagement challenges. One notable example is the ResearchBuddie artefact developed to support postgraduate research processes. This generative AI tool helps students conceptualise research topics, refine proposals, and structure academic writing (Segooa, Modiba, & Motjolopane, 2025). In contexts where supervisory capacity is overstretched, such AI-enabled interventions can significantly enhance academic support, particularly at postgraduate level. Similar innovations have been seen in some private institutions, where AI chatbots and adaptive learning platforms are trialled to deliver course content and handle student queries (Tankou epse Nukunah, Bezuidenhout, & Furtak, 2019).

Globally, AI applications in education have been categorised into five primary use cases: assessment and evaluation, predictive analytics, intelligent tutoring systems (ITS), AI assistants (e.g., ChatGPT), and student learning management systems (Crompton & Burke, 2023). These tools offer benefits such as real-time feedback, automated grading, and personalised learning pathways. The World Economic Forum (2023) highlights the potential of such AI systems to alleviate administrative burdens on educators and create opportunities for more creative and relational teaching practices. South African educators have echoed this sentiment, particularly in large undergraduate classes where AI can assist in scaling formative assessment and feedback. Despite these possibilities, South African higher education institutions face several constraints. Infrastructure disparities, variable digital literacy levels among staff, and limited institutional readiness all hinder the widespread adoption of AI tools. Shankar and Ramsaroop (2024) point out that broader organisational challenges such as underinvestment in staff training, technological barriers, and lack of feedback mechanisms affect performance across tertiary institutions—including in the context of teaching innovations. Moreover, there is a disconnect between national digital strategies and on-the-ground pedagogical implementation. As Patel and Ragolane (2024) observe, while South African universities recognise the strategic importance of AI, their operational capacity to integrate AI tools into curricula and pedagogy is often underdeveloped and lacks cohesive policy guidance.

Educator perceptions and readiness remain critical variables in determining the success of teaching *with* AI. Reina Marín et al. (2025) found that while many educators appreciate the potential of AI tools, they also express serious concerns about ethics, reliability, and the erosion of human-centred pedagogy. In a multi-country survey, 73.1% of lecturers were sceptical about AI improving the quality of teaching, fearing it may deskill educators and undermine student creativity. These sentiments are echoed in South African studies, where lecturers often feel unprepared and unsupported in integrating AI into their teaching workflows (Ayanwale et al., 2022). As a result, many educators rely on informal experimentation rather than structured institutional initiatives. Students, conversely, are often at the forefront of adopting AI tools particularly generative AI for academic writing, research, and coding tasks. While this reflects their adaptability and the usefulness of these tools, it also raises concerns about academic integrity. ChatGPT, for instance, can generate essays, solve mathematical problems, and simulate peer responses, making it difficult for lecturers to detect original work. Bozkurt (2023) notes that this shift challenges traditional assessment practices and necessitates a redesign of pedagogical strategies to promote critical thinking and originality. In South Africa, where assessment models often rely on written assignments and take-home tasks, the risk of misuse is particularly acute.

Additionally, the lack of culturally and linguistically inclusive AI systems is a significant barrier. Most generative AI tools are trained on predominantly English and Western datasets, limiting their relevance and effectiveness in South Africa's multilingual and multicultural education landscape. This marginalisation of local languages and knowledge systems is a concern highlighted by scholars advocating for decolonised curricula and culturally responsive pedagogy. Ndlovu and Mafora (2024) argue that partnerships between AI developers, educators, and policymakers are essential to produce tools that reflect African contexts and epistemologies. Ethical considerations are equally pressing. The collection, processing, and use of student data by AI systems raise issues of privacy and consent particularly in light of the Protection of Personal Information Act (POPIA). Bond et al. (2024) warn that the unregulated use of AI tools can exacerbate existing inequalities and expose students to surveillance and profiling. In under-resourced institutions, where infrastructure for data governance is weak, such risks are magnified. As Patel and Ragolane (2024) emphasise, ethical frameworks must be embedded in institutional policy and not treated as an afterthought.

To navigate these complex dynamics, a context-sensitive approach to AI integration is necessary. South African universities should begin by developing institutional AI policies that define appropriate uses, ethical boundaries,

and pedagogical goals. These policies must be accompanied by professional development initiatives that equip staff with both technical and critical AI literacies. Furthermore, students should be supported to engage with AI tools in ways that enhance, rather than replace, their learning. Educators and students alike need training not just in how to *use* AI, but in how to *understand* and *critique* it. Teaching *with* AI in South Africa also needs to align with the broader transformational imperatives of the higher education system, including access, equity, and decolonisation. AI should not be used to replicate unequal systems or automate exclusionary practices. Instead, it should support multilingualism, diverse knowledge systems, and inclusive teaching methods. This will require localised datasets, open-source AI tools, and collaborative partnerships between universities, government, and the private sector.

3. THEORETICAL FRAMEWORK

The Technology Acceptance Model (TAM), developed by Davis (1989), serves as a foundational framework for understanding how users come to accept and use new technologies. It posits that two primary factors Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) influence an individual's attitude toward using a particular technology, which in turn affects their behavioural intention to use it. PU refers to the degree to which a person believes that using the technology will enhance their performance, while PEOU pertains to the degree to which the technology is perceived as free of effort. In the context of higher education, these constructs are particularly relevant as academic staff navigate the rapid introduction of generative AI tools such as ChatGPT into pedagogical and assessment practices. As noted by Naarmala (2004), PU plays a pivotal role in determining whether educators adopt a new technology, especially when it demonstrably improves efficiency or learning outcomes. Several studies, including Ragolane and Patel (2024a, 2024b), confirm that South African educators view AI positively when it streamlines marking tasks and enhances grading consistency, though scepticism remains over AI's limitations in handling subjectivity and contextual nuance.

Recent empirical studies in South Africa have applied the TAM framework to AI adoption in education with nuanced results. For example, Ragolane, Patel, and Phiri (2025) demonstrate that while academic professionals generally view AI grading as useful, their ease of use is hindered by a lack of formal training and contextual adaptation. The same study highlights the socio-cultural layer in TAM adoption, noting that educators' intentions to use AI are shaped not only by functionality but also by ethical and institutional concerns. This extends Ghapanchi and Talaei-Khoei's (2018) critique of TAM, which argues that it often fails to predict actual usage behaviour, especially post-adoption. Moreover, Nicholas-Omoregbe *et al.* (2018) suggest that technology adoption is also shaped by social influence and facilitating conditions, ideas captured in the extended UTAUT model. These perspectives are crucial in the South African context, where disparities in institutional capacity and digital literacy create uneven readiness for AI integration. While TAM remains a useful starting point, its application in education, particularly in the Global South, requires engagement with broader socio-technical, ethical, and pedagogical factors. Cukurova (2025) argue similarly that successful AI adoption must go beyond functionality to include shared human-AI agency, transparency, and epistemic accountability. Furthermore, successful AI adoption in higher education demands more than just technological functionality; it also requires cultural sensitivity, professional development, and institutional support that together shape how technology is perceived, adopted, and ultimately utilised in practice.

4. METHODOLOGY

This study adopts a qualitative, exploratory research design aimed at critically analysing how artificial intelligence (AI) is being taught and used as a pedagogical tool in South African higher education. Data were collected through a structured review of existing scholarly literature, policy reports, and conceptual papers on the intersection of AI and teaching. A purposive sampling strategy was employed to identify relevant sources using academic databases such as JSTOR, ResearchGate, Google Scholar, and Google Search. The search was guided by key terms including *"teaching with AI," "AI," "higher education,"* and *"AI in teaching"*. The literature was selected based on relevance to higher education contexts, with a focus on both international perspectives and South African case studies. Sources included peer-reviewed journal articles, conference proceedings, and institutional publications from 2018 to 2025 to ensure currency and depth. The collected data were analysed thematically, with patterns identified around curriculum development, pedagogical integration, educator perceptions, and ethical implications. This qualitative approach allows for an in-depth understanding of both the opportunities and challenges posed by AI in educational contexts, particularly within the socio-economic and institutional realities of South Africa.

5. FINDINGS AND DISCUSSION

5.1. Curriculum Development and Uneven Access

A key finding is that the integration of AI as a subject of study in South African higher education is advancing but unevenly distributed across institutions. Research shows that well-resourced universities such as the University of Cape Town and Stellenbosch have introduced AI modules within computer science and data science programmes, while historically disadvantaged institutions (HDIs) often lack the infrastructure and skilled personnel required to do so (Segooa *et al.,* 2025). The disparity stems not only from funding gaps but also from the absence of national coordination on AI curriculum development. Consequently, some institutions remain on the periphery of digital transformation, thereby perpetuating existing educational inequalities. In several cases, AI content is embedded in existing ICT or engineering courses without sufficient emphasis on ethical, contextual, or interdisciplinary dimensions. The literature indicates a growing awareness that AI literacy must extend beyond technical skills to include societal implications such as data bias, algorithmic discrimination, and digital rights (Bozkurt, 2023; Crompton & Burke, 2023). However, these themes are inconsistently addressed in current teaching practices.

5.2. Adoption of AI Tools in Teaching Practice

Another major finding is the increasing but fragmented adoption of AI tools like ChatGPT and intelligent tutoring systems in classroom practice. Some educators, particularly in postgraduate programmes, are using tools such as ResearchBuddie to assist students with literature reviews and proposal structuring (Segooa *et al.,* 2025). AI tools are also deployed for formative feedback and automated grading in select faculties, particularly in private or better-resourced institutions. Despite these promising innovations, most staff still lack institutional support, training, or clear policy direction. As a result, AI adoption is largely individualised and experimental. The World Economic Forum (2023) highlights how AI can augment teaching by handling administrative tasks, freeing educators to focus on relational and creative instruction. Yet, in South Africa, this promise is constrained by unequal access to digital tools and varying levels of educator digital literacy.

5.3. Educator Perceptions and Ethical Concerns

Educators' perceptions of AI are mixed. While many acknowledge its potential to enhance teaching and administrative efficiency, significant concerns persist regarding academic integrity, ethical use, and the loss of human interaction in the learning process (Reina Marín *et al.,* 2025). Similarly, Singh *et al.* (2025) found that while AI in distance learning enhances feedback and personalisation at scale, it raises ethical concerns around authority, monitoring, and accountability, emphasising the importance of human oversight. There is widespread uncertainty about how to assess student work fairly when generative tools like ChatGPT can produce sophisticated responses. Some staff express fears that these tools could lead to plagiarism, reduce student effort, and devalue critical thinking. Additionally, ethical questions about data privacy, algorithmic bias, and transparency are common. Many AI platforms are built on datasets that are not representative of African linguistic and cultural contexts, reinforcing epistemic exclusion. Institutions often lack comprehensive policies on data governance, leaving educators and students vulnerable to breaches of privacy and algorithmic surveillance (Bond et al., 2024). This concern is especially relevant in South Africa's socio-political context, where educational technologies must also meet decolonial and inclusive pedagogical imperatives.

5.4. Digital Inequality and Infrastructure Gaps

Digital divides across institutions and regions continue to shape both the teaching *of* and teaching *with* AI. Access to reliable internet, updated hardware, and relevant software remains a challenge in many rural and underfunded campuses. As Tankou epse Nukunah *et al.* (2019) argue, digital infrastructure disparities are a major barrier to innovation and equity in South African higher education. Students from disadvantaged backgrounds are less likely to benefit from AI-enhanced instruction, contributing to deepening performance gaps. Moreover, most AI tools are designed for stable, high-bandwidth environments, which many South African students do not consistently have. This reinforces a two-tier educational system where only some can leverage cutting-edge tools for academic advancement. As such, while AI has the potential to enhance pedagogy, its deployment without attention to equity risks entrenches existing inequalities.

5.5. Need for Professional Development and Institutional Support

The successful use of AI in higher education teaching requires not only access to technology but also robust professional development and institutional frameworks. Most educators lack formal training in AI or exposure to pedagogically informed applications of the technology. As noted by Ayanwale *et al*. (2022), professional development is a key enabler of technology adoption, yet it remains underfunded and fragmented across South African universities. Training programmes that include both technical and ethical components are urgently needed to prepare educators for the new AI-driven educational landscape. Institutionally, there is a clear need for guidelines on how AI should be used in teaching, assessment, and student support. Without coordinated policy

frameworks, AI adoption risks being inconsistent and potentially harmful. Educators are calling for clearer rules, ethical guidance, and infrastructural investment to ensure that AI supports, rather than supplants, human-centred education.

6. CONCLUSION

The integration of Artificial Intelligence into South African higher education presents both unprecedented opportunities and significant challenges. This article has explored two intersecting dynamics: the teaching *of* AI as a subject within university curricula and the use of AI tools *in* teaching practices. While some South African institutions are making strides in incorporating AI into formal instruction and experimentation with generative AI tools such as ChatGPT and ResearchBuddie, these efforts are uneven and often limited by infrastructural, policy, and training constraints. The findings underscore a widening gap between well-resourced and historically disadvantaged institutions, particularly in terms of AI curriculum development, digital access, and staff readiness. Educators remain cautiously optimistic about AI's pedagogical potential but express serious concerns around academic integrity, ethical usage, and the risk of reinforcing existing inequalities. Moreover, the lack of national policy coherence and institutional guidance contributes to fragmented adoption patterns, leaving educators and students to navigate complex technological terrain largely unsupported. To ensure that AI contributes meaningfully to the goals of equity, transformation, and quality in higher education, a coordinated, context-sensitive approach is required. This includes investment in infrastructure, professional development, culturally responsive AI tools, and ethical policy frameworks. Ultimately, AI in South African higher education must be pursued not as a one-size-fits-all solution, but as a dynamic and critically engaged tool that enhances learning, promotes inclusion, and respects the diverse realities of students and educators across the system. As Singh *et al.* (2025) argue, AI should enhance human effort in teaching, not replace it, especially in contexts that require emotional intelligence, critical engagement and ethical judgment.

7. SUGGESTIONS FOR FUTURE STUDIES

Future studies could investigate how teaching artificial intelligence and teaching with artificial intelligence in South African higher education can support decolonial educational goals, including linguistic inclusion and epistemic justice. Research should also explore how AI tools can be effectively integrated into institutional strategies for the professional development of students and educators, particularly in under-resourced contexts. Finally, longitudinal studies could assess the pedagogical impact of AI adoption on learning equity and academic performance across diverse institutional types.

REFERENCES

Ayanwale, M. A., Sanusi, I. T., Adelana, O. P., Aruleba, K. D., & Oyelere, S. S. (2022). Teachers' readiness and intention to teach artificial intelligence in schools. *Computers and Education: Artificial Intelligence, 3*, 100099. https://doi.org/10.1016/j.caeai.2022.100099

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

Bozkurt, A. (2023). Generative artificial intelligence (AI) powered conversational educational agents: The inevitable paradigm shift. *Asian Journal of Distance Education*, *18*(1). Retrieved from https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/718

Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: The state of the field. *International Journal of Educational Technology in Higher Education, 20*(22). https://doi.org/10.1186/s41239-023-00392-8

Cukurova, M. (2025). The interplay of learning, analytics and artificial intelligence in education: A vision for hybrid intelligence. *British Journal of Educational Technology*, 56, 469–488. https://doi.org/10.1111/bjet.13514

Department of Communications and Digital Technologies. (2020). *National digital and future skills strategy: South Africa*. https://www.dcdt.gov.za

Ghapanchi, A. H. & Talaei-Khoei, A. (2018) Rethinking Technology Acceptance: Towards a Theory of Technology Utilization. Towards Technology Utilization Theory. Twenty-fourth Americas Conference on Information Systems, New Orleans, pp 1-9

Imran, M., Almusharraf, N. M., & Abbasova, M. (2024). Artificial intelligence in higher education: Enhancing learning systems and transforming educational paradigms. *International Journal of Interactive Mobile Technologies, 18*(18). https://doi.org/10.3991/ijim.v18i18.49143

Kajiita, R. M., & Kang'ethe, S. M. (2025). Accelerators and inhibitors of artificial intelligence uptake in South Africa: Implication for social service professional training and practice. *International Journal of Learning, Teaching and Educational Research, 24*(3), 134–148. https://doi.org/10.26803/ijlter.24.3.7

Khoalenyane, N., & Ajani, O. A. (2024). A systematic review of artificial intelligence in higher education in South Africa. Social Sciences and Education Research Review, 11 (1), 17 – 26. https://doi.org/10.5281/zenodo.15258127

Le Grange, L. (2016). Decolonising the University Curriculum". *South African Journal of Higher Education* 30 (2), 1-12. https://doi.org/10.20853/30-2-709.

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

Li Haoyang, D., & Towne, J. (2025). How AI and human teachers can collaborate to transform education. *World Economic Forum*. https://www.weforum.org/stories/2025/01/how-ai-and-human-teachers-can-collaborate-to-transform-education/

Luo, J., Zheng, C., Yin, J., & Teo, H. H. (2025). *Design and assessment of AI-based learning tools in higher education: a systematic review*. *International Journal of Educational Technology in Higher Education, 22*, Article 42. https://doi.org/10.1186/s41239-025-00540-2

Maphalala, M. C., & Ajani, O. A. (2025). Leveraging artificial intelligence as a learning tool in higher education. *Interdisciplinary Journal of Education Research, 7*(1), a01. https://doi.org/10.38140/ijer-2025.vol7.1.01

Mpungose, C. B. (2020). Emergent transition from face-to-face to online learning in a South African university in the context of the coronavirus pandemic. *Humanities and Social Sciences Communications, 7*, 113. https://doi.org/10.1057/s41599-020-00603-x

Naarmala, J. (2004). Reflections on Technology Acceptance in Higher Education. ECIS 2004 Proceedings. 136. http://aisel.aisnet.org/ecis2004/136

Ndlovu, P., & Mafora, O. A. (2024). Strategies for enhancing learning outcomes through partnerships in South Africa's education sector. In M. L. MokheleMakgalwa, M. A. Mohale & T. L. Madise (Eds.), Proceedings of the 40th AEAA Annual Conference on Reimagining Educational Assessment in the Age of Multiple Dimensions of Learning in a Global Society (pp. 17–29). ERRCD Forum. https://doi.org/10.38140/obp2-2024- 02

Nicholas-Omoregbe, O.S., Osabohien, R.A., Ibidapo, D., Omoregbe, N.A., Idemudia, E.C., Mbarika, V.W., & Noguera, J. (2018). A Study of Factors Affecting Technology Usage. Americas Conference on Information Systems.

Patel, S., & Ragolane, M. (2024). The Implementation of Artificial Intelligence in South African Higher Education Institutions: Opportunities and Challenges. *Technium Education and Humanities*, *9*, 51–65. https://doi.org/10.47577/teh.v9i.11452

Ragolane, M. & Patel, S. (2025). AI Grading Systems in Education: A Panacea or Drawback for South African Higher Education. In F. Moreira & R. Teles (Eds.), *Improving Student Assessment With Emerging AI Tools* (pp. 245-272). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-6170-2.ch009

Ragolane, M., & Patel, S. (2024b). Artificial Intelligence, Digital Grades and Human Voices: Students' Perceptions on AI Grading in Higher Education. International J. Soc. Sci. & Education. 2024(14), 32-64. http://ijsse.com/Paper-04.pdf

Ragolane, M., Patel, S., & Phiri, J. (2025). Navigating Artificial Intelligence in Assessment: Academic Professionals' Perceptions of AI Grading in South Africa. *Technium Education and Humanities*, *11*, 156–172. https://doi.org/10.47577/teh.v11i.12908

Reina Marín, Y., Cruz Caro, O., Maicelo Rubio, Y. d. C., Alva Tuesta, J. N., Sánchez Bardales, E., Carrasco Rituay, A. M., & Chávez Santos, R. (2025). Artificial intelligence as a teaching tool in university education. *Frontiers in Education, 10*, 1578451.

Reina Marín, Y., Cruz Caro, O., Maicelo Rubio, Y. del C., Alva Tuesta, J. N., Sánchez Bardales, E., Carrasco Rituay, A. M., & Chávez Santos, R. (2025). Artificial intelligence as a teaching tool in university education. *Frontiers in Education, 10*, 1578451. https://doi.org/10.3389/feduc.2025.1578451

Segooa, M. A., Modiba, F. S., & Motjolopane, I. (2025). Generative artificial intelligence tools to augment teaching scientific research in postgraduate studies. *South African Journal of Higher Education, 39*(1), 300–320. https://doi.org/10.20853/39-1-6275

Shankar, N.G., & Ramsaroop, A. (2024). Advancing SDGs and performance management strategies for security personnel in higher education. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur, 22*(0), a2709. https://doi.org/10.4102/sajhrm.v22i0.2709

Singh, A. K., Kiriti, M. K., Singh, H., & Shrivastava, A. (2025). Education AI: Exploring the impact of artificial intelligence on education in the digital age. *International Journal of System Assurance Engineering and Management*, 16, 1424–1437. https://doi.org/10.1007/s13198-025-02755-y

Tankou epse Nukunah, C., Bezuidenhout, A., & Furtak, A. (2019). The contribution of a private higher education institution to the South African higher education landscape. *South African Journal of Higher Education*, *33*(1), 283-300. https://doi.org/10.20853/33-1-2689