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Navigating the Challenges of Artificial Intelligence Adoption in Nigerian University Management

Iyanuoluwa Samuel Adelakun[1]*, Mayokun Adeyoola Adelakun[2], Sariat Iyabo Salaam[3], Stephen Olanrewaju Oni[4], Bukola Roseline Aruleba[5]

[1]Department of Educational Management and Business Studies, Faculty of Education, Federal University Oye-Ekiti, Nigeria
[2]Department of Physiology, Faculty of Basic Medical Sciences, Federal University Oye-Ekiti, Nigeria
[3]Department of Educational Management and Business Studies, Faculty of Education, Federal University Oye-Ekiti, Nigeria
[4]Department of Science Education, Faculty of Education, Federal University Oye-Ekiti, Nigeria
[5]Department of Educational Management and Business Studies, Faculty of Education, Federal University Oye-Ekiti, Nigeria

Corresponding Email: adelakuniyanuoluwasamuel@gmail.com

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Abstract

Artificial Intelligence (AI) is transforming higher education globally by improving administrative efficiency, enhancing teaching and learning, and supporting data-driven decision-making. In Nigeria, however, AI adoption within university management remains limited due to infrastructural deficits, insufficient technical expertise, resistance among academic staff, fragmented policies, and ethical concerns. This study examines the challenges to AI integration in Nigerian universities and proposes strategies for sustainable adoption. It adopts a Structured Systematic Literature Review (SSLR) with conceptual synthesis. A total of 60 peer-reviewed studies and policy-related publications published between 2020 and 2026 were identified, screened, and synthesised to examine evidence on AI adoption in higher education management. Thematic analysis was employed to identify recurring patterns relating to technological readiness, human capacity, institutional culture, governance, and regulatory frameworks. The findings indicate that although awareness of AI's potential is increasing, implementation remains constrained by systemic deficiencies in infrastructure, digital competencies, institutional support mechanisms, policy coherence, and ethical oversight. The study further reveals that successful AI adoption requires alignment among technological capabilities, organisational processes, human competencies, and responsible governance structures. It concludes that integrating AI into Nigerian university management is not merely a technological initiative but a broader socio-institutional transformation. By synthesising theoretical and empirical insights, the study contributes to the growing discourse on digital transformation in higher education and offers context-specific recommendations for policymakers, university administrators, and educators seeking effective and sustainable AI implementation strategies.

Keywords: Artificial Intelligence (AI); Higher Education; Technology Adoption; Nigerian Universities; Educational Innovation

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INTRODUCTION

Artificial Intelligence (AI) is transforming higher education worldwide, reshaping teaching, research, and institutional administration. Broadly defined as computer systems capable of performing tasks that typically require human intelligence, such as learning, reasoning, and decision-making, AI now underpins a growing range of university applications, including adaptive learning systems, intelligent tutoring platforms, predictive analytics, automated assessment, and generative tools (Luckin et al., 2016; UNESCO, 2021; Ebiringa et al., 2025; Wang et al., 2024; Katsamakas et al., 2024). Between 2020 and 2026, these applications expanded beyond analytics into content generation, research support, planning, and process automation (Mosha et al., 2026), a shift accelerated by the COVID-19 pandemic, which forced universities worldwide to rely on digital technologies to sustain teaching, learning, and administrative functions. In many advanced economies, AI is now embedded in core academic and management systems, supporting student retention, performance monitoring, resource allocation, and strategic planning (Zenda & Dewa, 2025; Kasneci et al., 2023; Maqoqa, 2025). These benefits, however, are unevenly distributed: persistent gaps between developed and developing regions reflect differences in technological infrastructure, financial resources, institutional readiness, and regulatory support (OECD, 2023; UNESCO, 2025; Masike, 2026; Maluleke, 2025; Mosha et al., 2026), constraining the scope and impact of AI adoption in less-resourced contexts.

Across Africa, AI is increasingly recognised as a strategic resource for strengthening institutional performance, expanding educational access, and improving service delivery in higher education, through applications such as predictive analytics, intelligent tutoring, automated communication, and adaptive learning technologies that enhance student engagement and administrative efficiency (Dwivedi et al., 2021; Choudhury & Pattnaik, 2020; Zawacki-Richter et al., 2020). Yet integration across African universities remains uneven, hindered by weak digital infrastructure, limited funding, insufficient policy readiness, disparities in internet access, and shortages of digital skills (Tchamyou, 2020; Dwivedi et al., 2021; Maluleke, 2025). Compounding these structural barriers are unresolved concerns around data governance, algorithmic bias, transparency, privacy, and equitable access, which continue to fuel debate over responsible AI use in education (Zawacki-Richter et al., 2020; Dwivedi et al., 2021). Collectively, this evidence suggests that effective AI implementation in the African higher education context depends on more than technological investment; it requires institutional capacity, contextual adaptation, and robust governance structures. Nigeria's higher education sector reflects this broader African pattern of growing interest constrained by limited execution. Awareness of AI's potential is rising, but adoption remains isolated rather than institutionalised (Olan et al., 2022). Digital transformation efforts are hampered by unreliable electricity, poor internet connectivity, inadequate funding, bureaucratic bottlenecks, and uneven digital readiness among staff and students (Adedoyin & Soykan, 2020; Adelakun, 2020; Olan et al., 2022; Nnaji et al., 2026). While some institutions have adopted technology for teaching, assessment, and administrative tasks, the depth and consistency of AI integration vary considerably: public universities, constrained by limited resources, generally lag behind their more flexible private counterparts in digital innovation (Adelakun, 2020; Olan et al., 2022). Institutional, financial, and governance factors therefore jointly shape the pace and direction of AI adoption across Nigerian universities.

Despite growing scholarly interest in AI in higher education, research in Nigeria has concentrated mainly on AI's role in teaching and learning, user perceptions, and pedagogical outcomes. While these studies offer valuable insights, they provide a limited understanding of the institutional and managerial dimensions of AI adoption. In particular, little attention has been paid to how technological readiness, human resources, organisational culture, governance, ethics, and policy jointly shape the integration of AI into university management

systems. This gap matters because AI adoption is not merely a technological undertaking; it involves complex interactions among organisational, social, regulatory, and institutional factors. Perspectives drawn from Diffusion of Innovation Theory, Socio-Technical Systems Theory, and Institutional Theory suggest that successful adoption depends not only on the attributes of the technology itself, but also on organisational processes, stakeholder readiness, and institutional pressures (Katsamakas et al., 2024). Yet few studies have examined these factors comprehensively within the Nigerian university management context.

This study addresses this gap by adopting a Structured Systematic Literature Review (SSLR) with conceptual synthesis to examine the infrastructural, human, ethical, governance, and policy challenges to AI adoption in Nigerian university management. Drawing on 60 peer-reviewed studies and policy-related publications published between 2020 and 2026, the review identifies recurring thematic patterns, develops an integrative framework, and proposes strategies for sustainable AI implementation. In doing so, the study shifts the analytical focus from AI in teaching and learning to the institutional and managerial factors that are vital for effective, AI-enabled university governance in Nigeria and comparable contexts.

Statement of the Problem

Artificial Intelligence is increasingly seen as a strategic asset for enhancing decision-making, administrative efficiency, and service delivery in higher education. While Nigerian universities are showing more interest in AI technologies, their adoption within university management remains sporadic and limited. Consequently, many institutions have yet to fully harness AI's potential to boost effectiveness and competitiveness. While prior research has explored AI adoption in higher education, most studies focus on specific aspects like technological readiness, faculty perceptions, student use, or attitudes toward new technologies. As a result, they provide only a limited understanding of the factors influencing AI adoption in university management systems. There is still a lack of empirical evidence on how technological, organisational, and institutional factors interact specifically in Nigerian universities. This gap is crucial because AI adoption is a complex process that involves more than just technological availability. Without a complete understanding of the interconnected factors that enable or impede implementation, university administrators and policymakers risk creating disjointed interventions that fail to effectively support sustainable AI integration. The lack of an overarching theoretical framework further constrains the development of strategies tailored to Nigeria's university management context. The research gap by providing a comprehensive view of the technological, organisational, and institutional factors influencing AI adoption in Nigerian universities. By analysing these factors within a cohesive framework, it seeks to generate insights that will guide policies and strategies for successful and lasting AI integration in higher education management.

Theoretical Framework

This study is grounded in Diffusion of Innovation Theory, Socio-Technical Systems Theory, and Institutional Theory. AI adoption in university management is not reducible to a single explanatory lens: it involves the interaction of individual adopters' perceptions of a technology, the organisational systems that surround its use, and the external pressures that make adoption appear necessary or legitimate. Integrating these three theories therefore addresses the absence of an overarching framework identified above and provides a lens for reading the technological, human, organisational, and regulatory dimensions of AI adoption in Nigerian university management as interrelated rather than separate concerns. Diffusion of Innovation Theory explains how innovations spread through a social system according to their perceived relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). Applied to Nigerian higher education, the theory helps account for why AI adoption

remains uneven across institutions: studies attribute slower uptake to infrastructural constraints, limited technical expertise, and inadequate institutional investment, all of which reduce the perceived relative advantage of AI tools while increasing their perceived complexity (Bali et al., 2024; Ibrahim et al., 2024). Katsamakas et al. (2024) similarly find that adoption outcomes depend as much on organisational readiness and stakeholder perception as on the technical sophistication of the innovation itself. Diffusion of Innovation Theory is therefore useful for explaining variation among individual adopters and institutions, but on its own it says little about how a technology becomes embedded within, and is reshaped by, the organisational systems around it, a gap that Socio-Technical Systems Theory addresses.

Socio-Technical Systems Theory shifts the unit of analysis from the individual adopter to the organisation, treating technological and social subsystems as jointly determining implementation outcomes rather than the technology acting in isolation. Evidence from African higher education supports this view: Maluleke (2025) and Afolabi (2024) find that digital literacy, leadership support, and institutional culture, rather than technology availability alone, account for much of the variation in AI integration outcomes across universities. Read alongside the diffusion literature above, this suggests that the barriers reported for Nigerian universities are less a matter of technical deficit than a misalignment between AI systems and the organisational structures, leadership practices, and staff competencies meant to support them. Socio-Technical Systems Theory strengthens the framework by directing attention inward, to organisational alignment, but it offers less explanation of why universities pursue AI adoption in the first place, particularly under pressures that originate outside the institution, a gap that Institutional Theory addresses. Institutional Theory explains organisational behaviour as a response to regulatory, normative, and mimetic pressures that confer legitimacy, not merely efficiency (DiMaggio and Powell's framework, as applied in Olan et al., 2022). In the Nigerian context, universities face converging pressures from government digital transformation policy, accreditation requirements, and international benchmarking, all of which push institutions toward AI adoption regardless of their internal readiness (Eleje et al., 2025). Afolabi (2024) further shows that differences in institutional autonomy and regulatory oversight produce uneven implementation across universities, an outcome that echoes the organisational-level variation identified by Socio-Technical Systems Theory but locates its source in the external institutional environment rather than internal capacity alone.

Read together, these theories are less a checklist of separate perspectives than a layered explanation of the same phenomenon at three levels: Diffusion of Innovation Theory accounts for variation at the level of the individual adopter and technology attributes, Socio-Technical Systems Theory accounts for variation at the level of organisational alignment, and Institutional Theory accounts for variation at the level of the external environment that legitimises or constrains adoption. This layered reading is consistent with prior calls for multi-theoretic explanations of digital transformation in developing-country higher education, where technological, organisational, and institutional constraints tend to operate simultaneously rather than in isolation (Olan et al., 2022; Crompton & Burke, 2023; Petrova, 2026). None of the three theories, applied alone, adequately explains why AI adoption in Nigerian universities remains uneven despite growing awareness of its benefits; combined, they indicate that adoption depends on the joint alignment of perceived technological advantage, organisational readiness, and institutional pressure. This integrated reading forms the conceptual basis of Figure 1.

Figure 1: Conceptual Framework for AI Adoption in Nigerian University Management

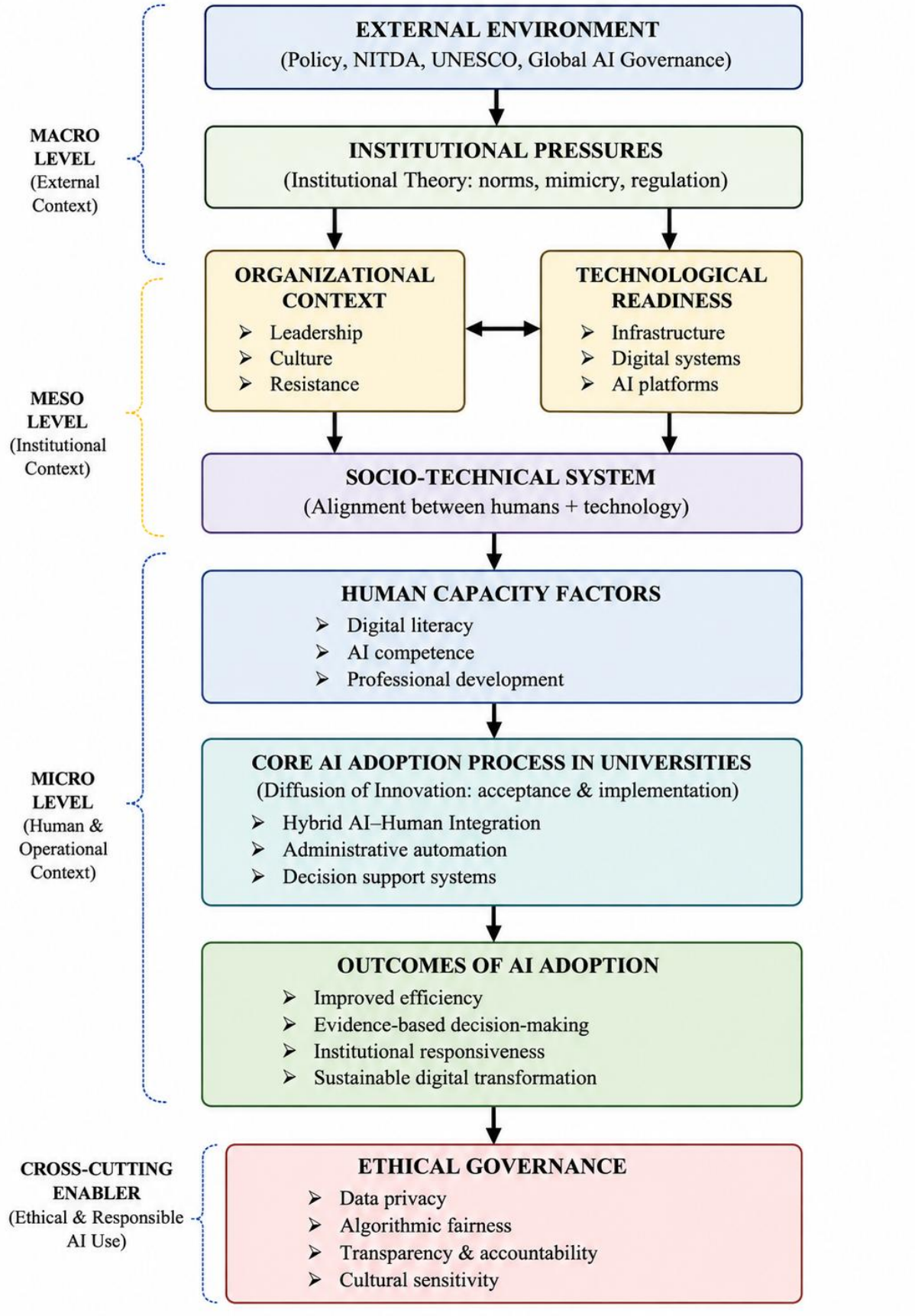


Figure 1 translates this integrated framework into a visual model, showing how institutional pressures, organisational conditions, technological readiness, human capacity, and ethical governance interact to produce the context-dependent AI adoption process described above; sustainable improvement in Nigerian university management requires alignment among technological capabilities, institutional structures, and stakeholder competencies.

Conceptual Approaches to Navigating AI Adoption Challenges in Nigerian University Management

The adoption of Artificial Intelligence in Nigerian university management is increasingly framed as a multidimensional transformation shaped by infrastructural, institutional, ethical, and human-capacity constraints. Recent African higher education literature emphasises that successful AI integration depends less on technological availability and more on organisational readiness, governance structures, and the development of human capabilities (Olan et al., 2022; Crompton & Burke, 2023). Empirical evidence from Nigeria and other African contexts further confirms that AI adoption remains uneven because of systemic infrastructural limitations, policy fragmentation, and limited digital competence among institutional actors (Maluleke, 2025; Eleje et al., 2025).

Building on this, this section highlights five interrelated conceptual strategies for navigating AI adoption challenges: capacity building, hybrid integration, collaborative ecosystems, ethical governance, and contextual innovation.

Capacity Building and Digital Competence Development

One barrier to the adoption of artificial intelligence in Nigerian universities is insufficient digital literacy among academic and administrative staff. Studies at Nigerian universities have shown that limited competence in emerging technologies significantly hinders the effective integration of AI into teaching and managerial activities (Eleje et al., 2025; Agbarakwe & Chibueze, 2024). Recent evidence further indicates that structured professional development programmes in AI literacy, data analytics, and digital pedagogy significantly influence institutional readiness and staff acceptance of AI integration into universities' activities (UNESCO, 2024; OECD, 2024). Similarly, Olan et al. (2022) observed that digital skills development is an important predictor of successful AI-enabled transformation in higher education institutions in developing economies. From a diffusion perspective, Rogers' principles, when applied to contemporary AI education studies, show that early adopters within universities act as internal change agents who accelerate acceptance by demonstrating practical benefits such as administrative efficiency and improved decision-making. UNESCO (2021) further emphasises the need for sustainable AI adoption, which requires long-term investment in human capital development supported by national policy frameworks.

Hybrid AI–Human Integration in University Management

Hybrid integration models offer a balanced way to introduce AI into Nigerian universities without disrupting existing academic structures. These models integrate AI-enabled systems, such as automated assessments, predictive analytics, and learning management tools, with human-centred academic oversight. Studies show that AI-supported systems improve assessment efficiency and reduce administrative workload while preserving faculty members' academic judgement and contextual understanding (Agbarakwe & Chibueze, 2024; Zawacki-Richter et al., 2020). In African higher education, hybrid models are particularly effective at managing high student-to-staff ratios and resource constraints (Maluleke, 2025). This approach aligns with Socio-Technical Systems Theory, which focuses on jointly optimising technological systems and human organisational structures for

sustainable digital transformation (Mezher et al., 2026; Petrova, 2026; Rekab, 2025). In this framework, AI is seen as a complement to human expertise, not a substitute.

Collaborative Ecosystem and Institutional Partnerships

The adoption of artificial intelligence in Nigerian universities requires robust collaboration among relevant stakeholders, including higher education management, government agencies, and private-sector actors. Studies across African higher education systems indicate that inadequate infrastructure and a shortage of institutional funding can be mitigated through inter-university collaboration and shared digital ecosystems (Olan et al., 2022; Maluleke, 2025). Agencies such as the National Information Technology Development Agency (NITDA) in Nigeria play a vital role in shaping national artificial intelligence governance frameworks and in supporting the development of institutional capacity. Partnerships with related technology firms and local startups also contribute to contextual innovation, thereby reducing complete reliance on imported AI solutions. Institutional Theory offers a clearer picture by explaining that such collaborative arrangements can generate normative and mimetic pressures that drive universities towards AI adoption to maintain competitiveness, legitimacy, and compliance with sectoral expectations (DiMaggio & Powell framework applied in Olan et al., 2022). These pressures are reinforced by accreditation systems and regional benchmarking practices.

Ethical AI Governance and Accountability

Ethical governance is central to ensuring the responsible adoption of AI in the management of Nigerian university systems. Without strong governance structures, AI systems may exacerbate bias, inequality, and a lack of transparency in institutional decision-making processes. Recent African studies show growing concerns about algorithmic bias, data privacy breaches, and accountability in AI-driven educational systems (Williamson & Eynon, 2020; Afolabi, 2024). In Nigeria, these concerns are particularly relevant in sensitive administrative processes such as admissions, assessment grading, and student profiling. Empirical findings underscore the need for multidisciplinary governance structures involving ICT specialists, academic staff, and student representatives to ensure transparency and fairness in AI use (Eleje et al., 2025). Human-centred AI governance frameworks also prioritise equity, inclusivity, and institutional trust (UNESCO, 2021).

Contextual Innovation and Local Adaptation

Sustainable adoption of AI in Nigerian universities requires localising technologies to reflect socio-economic realities, infrastructural constraints, and cultural contexts. African higher education research consistently shows that AI systems are most effective when adapted to local conditions rather than imported from developed countries, which may not address the contextual realities of African socio-economic sectors (Mhlanga, 2022; Maluleke, 2025). Mobile-first and low-cost AI solutions are particularly critical in Nigeria, given the limited infrastructure and digital access. Studies further suggest that phased implementation, starting with administrative automation (e.g., admissions, scheduling) before extending to academic applications, reduces implementation risk and enhances institutional acceptance (Yajie, 2026). Contextual innovation also involves integrating indigenous knowledge systems, local case studies, and region-specific datasets into AI platforms to ensure relevance and usability.

These strategies are interconnected, interdependent, and mutually reinforcing. Capacity building supports hybrid integration; collaborative ecosystems support ethical governance; and, in the context of innovation, these strategies ensure long-term sustainability. Collectively, they form an integrated conceptual framework for understanding the adoption of artificial intelligence in the management of Nigerian universities.

RESEARCH METHOD

This study adopted a qualitative conceptual research design, using a structured systematic literature review (SSLR) to examine the challenges of AI adoption in Nigerian university management. A systematic search was conducted between January and March 2026 across Scopus, Web of Science, Google Scholar, ERIC, ResearchGate, and ScienceDirect, covering publications from 2020 to 2026. Search terms combined "Artificial Intelligence," "AI adoption," "digital transformation," "AI governance," and "digital leadership" with terms such as "higher education management," "universities," and "Nigeria," combined using Boolean operators and database-specific filters to improve precision. Studies were included if they were peer-reviewed articles, conference papers, or institutional reports published in English between 2020 and 2026 that addressed AI adoption, digital transformation, or higher education management in developing-country contexts. Studies published before 2020, opinion pieces lacking empirical or theoretical grounding, duplicates, and papers focused solely on classroom teaching were excluded. The search yielded 286 records; after removing 48 duplicates, 238 were screened by title and abstract, 118 proceeded to full-text review, and 60 met all inclusion and quality criteria for the final synthesis, at which point thematic saturation was reached. Each retained study was further appraised against four criteria — clarity of objectives, methodological transparency, relevance, and theoretical or empirical contribution — to ensure that only credible, relevant sources informed the review. The 60 studies were analysed using Braun and Clarke's (2006) six-step thematic analysis — familiarisation, initial coding, theme generation, theme review, theme definition, and synthesis — supported by a data extraction matrix recording each study's author, year, location, focus, methodology, and findings. The resulting constructs were organised using the Technology-Organisation-Environment (TOE) framework and Diffusion of Innovation (DOI) theory into technological, organisational, and environmental factors. This process informed the Integrated University AI Adoption Framework (IUAAF), which conceptualises adoption as five interacting constructs: technological readiness, organisational capacity, human capability, ethical governance, and institutional pressure. Trustworthiness was established through credibility (reliance on peer-reviewed sources), dependability (systematic documentation of the search, screening, and coding process), confirmability (consistency between objectives, coding, and interpretation, cross-checked against source studies), and transferability (synthesis across diverse but comparable developing-country contexts).

RESULTS AND DISCUSSION

Result

Six major themes emerged from the thematic analysis of the 60 reviewed studies, each corresponding to one of the study's six objectives. The themes below were derived from recurring codes identified during coding and categorisation, and are presented with supporting evidence from the literature.

Objective 1 (Theme 1 – Technological Infrastructure Deficit): To examine technological challenges affecting AI adoption in Nigerian university management.

Coding across the reviewed studies converged on a dominant theme of technological infrastructure deficit, the most frequently cited barrier across the corpus. Recurring codes centred on unreliable electricity, limited broadband access, and insufficient computing facilities, which were consistently reported as constraints on AI implementation in university management systems (Adedoyin & Soykan, 2020; Dwivedi et al., 2021). Frequent power outages were repeatedly coded as undermining system dependability; recurring national grid failures illustrate the scale of this instability, with widespread blackouts disrupting digital services across public institutions (Premium Times, 2026). Underfunding compounds the

problem, as many universities lack the capital budgets required to sustain servers, data centres, and campus-wide networks (Daily Post, 2024). Poor internet infrastructure was linked to constraints on cloud-based and real-time AI services (Olan et al., 2022), while a further recurring code, the absence of high-performance computing infrastructure, pointed to limits on the adoption of more sophisticated AI technologies (Zawacki-Richter et al., 2020; Bobels, 2026). Related evidence on Education 4.0 readiness similarly found that physical and digital infrastructure gaps constrain the practical rollout of emerging technologies in Nigerian higher education (Ebekozien et al., 2024). Taken together, these codes show that infrastructure deficits are not a peripheral technical issue but a foundational constraint that limits the return on investment in every other dimension of AI adoption — a cross-cutting role that prior Nigeria-focused studies, which largely treated infrastructure and human or governance factors as separate strands of enquiry, have not fully captured.

Objective 2 (Theme 2 – Human Capacity and Digital Skills Gap): To investigate human capacity factors influencing AI adoption.

A second major theme, human capacity and digital skills gap, emerged from codes describing staff competence, attitudes, and training, and was coded almost as frequently as infrastructure. Academic staff were repeatedly coded as lacking adequate digital and AI-related competencies, limiting meaningful engagement with AI systems (Olan et al., 2022). A related code captured resistance to adoption, shaped by concerns about job displacement, academic autonomy, and assessment control (Selwyn, 2019; Williamson & Eynon, 2020). This resistance was compounded by weak integration of ICT across administrative and academic functions, which several studies linked to inconsistent staff exposure to digital tools in day-to-day university operations (Awoniyi et al., 2025). A further code, limited institutional training and professional development, was consistently linked to reduced readiness for AI integration (Balogun et al., 2025). Unlike earlier Nigerian studies that framed digital-skills gaps primarily as a teaching-and-learning problem, the present synthesis shows the same deficit undermining administrative, planning, and decision-support functions, extending the skills-gap literature beyond the classroom into university management itself.

Objective 3 (Theme 3 – Organisational and Curricular Misalignment): To assess organisational factors affecting AI implementation.

The third theme, organisational and curricular misalignment, reflects codes describing how academic programmes, assessment systems, and institutional structures have failed to keep pace with AI-driven competencies. Curricula were repeatedly coded as largely theoretical and insufficiently aligned with skills such as data analytics, automation, and digital decision-making (Aina, 2022; Ladimeji, 2020). Related codes describe curricula and institutional structures as slow to adapt to Fourth Industrial Revolution demands, reinforcing rigidity in both academic content and administrative workflows (Fomunyam, 2022). Traditional assessment systems were coded as reinforcing this gap by limiting exposure to applied, AI-supported learning and management environments (Afolabi et al., 2026). Comparative literature mapping AI use across African higher education similarly found that adoption clusters around teaching applications while institutional and curricular restructuring lags (Oguntona & Emere, 2025). Together, these codes point to a structural misalignment, not simply a skills deficit, that constrains institutions' ability to embed AI into both academic and management systems — a distinction not clearly drawn in prior single-factor studies of Nigerian higher education.

Objective 4 (Theme 4 – Ethical and Governance Concerns): To explore ethical and governance challenges associated with AI adoption.

The fourth theme, ethical and governance concerns, was coded as a critical constraint on AI adoption. Codes clustered around data privacy, algorithmic bias, and surveillance risks in academic settings (Eke, 2020; Williamson & Piattoeva, 2022). A recurring code concerning the use of non-African datasets highlighted issues of fairness and contextual mismatch in predictive systems (Ayenew et al., 2025), while a further code captured cultural misalignment between imported AI systems and local educational practices as limiting effective adoption (Samuel et al., 2025; Luwoye et al., 2024). Closely related codes described the absence of institution-level ethical frameworks and accountability mechanisms as leaving staff and students exposed to opaque decision-making processes (Afolabi, 2024), a concern echoed in broader analyses of AI ethics in education that call for clearer consent, transparency, and bias-auditing procedures (Dave, 2025). These codes collectively show that ethical governance is treated in much of the literature as a compliance afterthought rather than a precondition for adoption — precisely the gap this synthesis addresses by positioning ethical governance as a core, interacting construct within the Integrated University AI Adoption Framework rather than a standalone concern.

Objective 5 (Theme 5 – Institutional and Policy Fragmentation): To examine institutional and policy-related factors influencing AI adoption.

The fifth theme, institutional and policy fragmentation, emerged from codes describing weak and inconsistent regulatory support. Although national digital transformation strategies exist, AI-specific governance frameworks for higher education were coded as underdeveloped (Ukwandu et al., 2021), a gap linked to inconsistent implementation across universities (Babalola et al., 2024). A further code, weak accreditation and quality assurance mechanisms, was associated with diminished institutional incentives for AI integration (Akiyode-Lawanson, 2020). Broader structural analyses of Nigerian university education reinforced this pattern, identifying policy inconsistency and weak regulatory oversight as long-standing, unresolved challenges rather than issues specific to AI (Ajape et al., 2020). Stakeholder-based evidence further shows that where governance structures are strengthened, institutional effectiveness and coordination improve measurably, suggesting that policy fragmentation is a solvable rather than fixed constraint (Nnaji et al., 2026). By comparison, regions with codified digital-education action plans show more coordinated rollout of institutional digital-competence frameworks (European Commission, 2023), underscoring the absence of an equivalent coordinating instrument in the Nigerian context — a gap the existing Nigeria-specific literature has repeatedly noted but rarely linked back to institutional AI adoption outcomes.

Objective 6 (Theme 6 – Interdependence of Adoption Barriers): To determine the relationship among objectives.

The sixth theme emerged not from a single set of codes but from cross-theme comparison during the final stage of the thematic analysis, which revealed that the five preceding themes are interdependent rather than isolated. Weak infrastructure was found to reduce the utilisation of human capacity, curriculum gaps reinforced skill shortages, and policy fragmentation limited coordinated implementation (Mhlanga, 2022). Evidence on AI-enabled process optimisation in higher education administration further shows that gains in one domain, such as automation of academic records, are quickly offset when parallel investment in staff capability and governance oversight is absent (Yajie, 2026). Similarly, institutional-performance research indicates that analytic and predictive tools deliver measurable benefit only where organisational readiness and infrastructure are already in place, reinforcing the same cyclical pattern identified here (Maqoqa, 2025). Together, these interconnections

describe a reinforcing cycle of low readiness and fragmented AI adoption across Nigerian universities. This interdependence is the central gap the study addresses: prior Nigerian and African literature has largely examined technological, human, curricular, ethical, and policy factors as separate strands, whereas this synthesis is among the first to model them as a single, interacting system specific to university management in Nigeria.

Synthesis of Findings and Research Gap Addressed

Across the six themes, three major findings stand out. First, technological and human-capacity deficits function as entry-level barriers to AI adoption, without which downstream investment in curricula, ethics, and policy yields a limited return. Second, ethical and governance weaknesses are not marginal concerns but active constraints on institutional trust and uptake, particularly where AI systems rely on non-African data and imported models. Third, and most significantly, none of the five substantive barriers operates in isolation; each reinforces and is reinforced by the others, producing the low-readiness cycle captured in Theme 6. This interdependence is the principal gap the current study fills. Much of the existing Nigerian and African literature reviewed has examined AI adoption through single-lens analyses of infrastructure, skills, ethics, or policy, and has concentrated overwhelmingly on teaching and learning rather than institutional management (Olan et al., 2022; Zawacki-Richter et al., 2020). By synthesising 60 studies through the Technology-Organisation-Environment framework and Diffusion of Innovation theory into the Integrated University AI Adoption Framework, this study demonstrates that sustainable AI adoption in Nigerian university management requires simultaneous, coordinated intervention across all five domains rather than sequential or siloed reform.

Discussion of findings

Consistent with the technological dimension of the Technology-Organisation-Environment (TOE) framework, the findings show that infrastructural shortcomings remain the most fundamental obstacle to AI adoption in Nigerian university management. AI systems depend on stable electricity, dependable internet, and sufficient computing resources, which are unevenly available across Nigerian higher education institutions. This corroborates earlier findings that infrastructure is a barrier to digital transformation in higher education (Adedoyin & Soykan, 2020; Dwivedi et al., 2021), while extending this literature by showing that such limitations do not merely restrict access to AI tools but also erode returns on parallel investment in staff training, digital governance, and organisational reform. Technological readiness functions as a foundational prerequisite rather than one barrier among equals. The human-capacity and digital-skills gap identified in this study is well explained by Diffusion of Innovation (DOI) theory, which holds that individuals resist innovations perceived as complex or disruptive to established routines, decision-making, and professional identity. This pattern echoes concerns raised by Williamson and Eynon (2020) and Olan et al. (2022) regarding staff resistance to educational technology. The findings extend this literature, however, by locating resistance not purely in individual attitudes but in limited institutional investment in professional development: faculty hesitancy is as much a symptom of systemic under-preparation as it is a personal response to disruptive technology.

Organisational and curricular misalignment further constrains adoption, reflecting the organisational dimension of the TOE framework. The persistence of theoretical, examination-driven curricula that give limited attention to data analytics, automation, and digital decision-making is consistent with earlier accounts of curriculum rigidity in African higher education (Aina, 2022; Ladimeji, 2020). This study extends that literature by showing that misalignment is not confined to teaching: the same rigidity constrains institutional readiness for AI in administration and planning, indicating that digital transformation requires organisation-wide

restructuring rather than technology procurement alone. Ethical and governance concerns, including data privacy, algorithmic bias, and the cultural mismatch of AI systems trained on non-African datasets, correspond to the environmental dimension of the TOE framework, within which institutional trust shapes willingness to adopt an innovation. These concerns are consistent with Eke (2020) and Williamson and Piattoeva (2022). The findings extend this work by showing that ethical governance functions as a precondition for adoption rather than a compliance afterthought: universities are unlikely to adopt AI at scale without mechanisms that assure staff and students of accountability, fairness, and responsible data use. Institutional and policy fragmentation, the fifth barrier, reflects weak and inconsistent regulatory support for AI in higher education, corroborating earlier observations that AI-specific governance frameworks remain underdeveloped in Nigeria (Ukwandu et al., 2021) and that accreditation and quality-assurance mechanisms provide limited incentive for institutional AI integration (Akiyode-Lawanson, 2020). In the absence of clear national guidelines, institutions respond to external and donor pressures rather than a coordinated policy direction, producing uneven adoption across the sector. This finding positions policy fragmentation as a solvable rather than fixed constraint, consistent with evidence that strengthened governance structures measurably improve institutional coordination (Nnaji et al., 2026).

Read together, the five barriers do not operate as isolated deficits but as a mutually reinforcing system, consistent with cross-theme evidence that weak infrastructure limits skills development, that skill shortages constrain curriculum reform, and that policy fragmentation weakens governance coordination (Mhlanga, 2022). This interaction can be understood as an interplay between the structural conditions described by the TOE framework and the perceived-attribute mechanisms described by DOI theory: where technological and organisational conditions are weak, AI is more readily perceived as complex and incompatible with existing practice, which in turn slows the human and policy investment needed to improve those same conditions. Evidence from AI-enabled process optimisation supports this reading, showing that gains from automating academic records are quickly eroded where staff capability and governance oversight are not developed in parallel (Yajie, 2026), while institutional-performance research confirms that analytic and predictive tools deliver measurable benefit only where organisational readiness and infrastructure are already established (Maqoqa, 2025).

Practically, this reinforcing cycle implies that incremental or single-domain interventions, such as funding infrastructure without accompanying investment in staff capability, curriculum reform, or governance, are unlikely to shift AI readiness in Nigerian universities. The findings instead point to the need for simultaneous, coordinated reform across technological, human, organisational, ethical, and policy domains, an implication addressed directly by the Integrated University AI Adoption Framework proposed in this study.

CONCLUSION

Artificial Intelligence offers clear potential to enhance administrative efficiency, decision-making, and institutional planning in Nigerian universities. However, adoption remains uneven, shaped by interconnected challenges, including infrastructural limitations, limited digital competencies among staff, resistance to change, fragmented policy frameworks, and ethical concerns. This study shows that integrating AI cannot be treated as a purely technical intervention. Rather, it reflects a broader institutional transformation that requires alignment among human capacity, organisational structures, and technological systems. Applying the Diffusion of Innovation, Socio-Technical Systems, and Institutional perspectives helps explain the slow pace of adoption and the limitations of technology-driven approaches. Progress depends on coordinated, context-sensitive strategies. Continuous capacity building, hybrid AI–human models, collaborative institutional arrangements, and clear ethical governance frameworks are essential for sustainable implementation. Equally important is

adapting AI strategies to local realities rather than relying on externally developed models. In practical terms, effective AI adoption in Nigerian university management will depend on steady, well-aligned implementation, supported by infrastructure development, strengthening institutional capacity, and coherent governance. Such an approach provides a more realistic pathway for the sustainable, contextually relevant implementation of AI.

REFERENCES

Abbas, R. & Michael, K. (2025). *Socio-Technical Theory: A review*. In S. Papagiannidis (Ed), TheoryHub Book. Available at https://open.ncl.ac.uk/theories/9/socio-technical-theory/

Adedoyin, O. B., & Soykan, E. (2020). COVID-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments, 31*(6), 1-13.

Adelakun, I.S. (2020). Coronavirus (COVID-19) and Nigerian education system: Impacts, management, responses, and way forward. *International Technology and Science Publications,* 3 (4), 88-102.

Afolabi, A. (2024). Ethical issues in artificial intelligence adoption in African higher education institutions in Nigeria. *African Journal of Information and Knowledge Management, 3*(2), 22–33.

Afolabi, A.F., Ayodele, M.O., & Ibrahim, O.Y. (2026). The fourth industrial revolution (4IR) and the transformative impact on libraries in Nigeria. *SSR Journal of Multidisciplinary.* 3(3). 48-57.

Agbarakwe, H. A., & Chibueze, O. O. (2024). Leveraging AI for assessment and feedback in Nigerian higher education. *International Journal of Research and Innovation in Social Science*. Accessed from https://rsisinternational.org/journals/ijriss/articles/leveraging-artificial-intelligence-for-enhanced-assessment-and-feedback-mechanisms-in-nigeria-higher-education-system/ or https://doi.org/10.47772/IJRISS.2024.809012

Aina, J.K. (2022). Entrepreneurial Education: Emerging Education 4.0 and the Fourth Industrial Revolution in Nigerian colleges of education. *Journal of Global Research in Education and Social Science.* 16(5). 14-21.

Ajape, T. S., Ogunode, N.J. & Jegede, D.D. (2020) University education in Nigeria: Challenges and Way Forward. *Journal Synaesthesia*, 10(2), 94-105.

Akiyode-Lawanson, J. (2020). Stakeholders say policy reformation and digital skills development are prerequisites for Nigeria in the fourth technological revolution. *Business Day.* Accessed from https://businessday.ng/technology/article/stakeholders-say-policy-reformation-digital-skills-development-are-prerequisites-for-nigeria-in-fourth-technological-revolution/?

Anjali Dave (2025). The Ethical implications of AI in education. *Research Review Journal of Social Science.* 5(1), 1-8.

Awoniyi B.K., Agboola O.J., & Olayinka F.B. (2025). Nigerian universities and the challenges of full integration of information and communication technology. *Euro Afro Studies International Journal*, 7(6), 1-16.

Ayenew, G.G., Dawit, D.D., & Abebe, W.M. (2025). Artificial intelligence in African higher education: Uses, misuses, and ethical dilemmas. Advances in artificial intelligence and machine learning 5(3), 4196-4221.

Babalola, S. S., & Genga, C. A. (2024). Managing Digital Transformation in African Higher Education Institutions: Challenges and Opportunities: Managing Digital Transformation. *International Journal of E-Learning & Distance Education Revue Internationale de l'e-learning et de la formation à distance*, *39*(1).

Bali, B., Garba, E. J., Ahmadu, A. S., Takwate, K. T., & Malgwi, Y. M. (2024). Analysis of emerging trends in artificial intelligence for education in Nigeria. *Discover Artificial Intelligence, 4*, 110.

Balogun, B.N., Adelakun, I.S., Olajide, I.O., and Osundare, I.O. (2025). The use of artificial intelligence (AI) in the management of universities in Nigeria. *Fuoye International Journal of Education*, 8(1), 19-35.

Bobels, (2026). *Development of educational technology in Nigeria.* Accessed from https://www.bobels.org/development-of-educational-technology-in-nigeria/?

Choudhury, S., & Pattnaik, S. (2020). Emerging Themes in E-Learning: A Review from the Stakeholders' Perspective. *Computers & Education,* 144, (1). 1-20.

Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: State of the field. *International Journal of Educational Technology in Higher Education, 20*(1).

Daily Post (2024). *Underfunding and inadequate infrastructure are hindering educational development in Nigeria.* Accessed from https://dailypost.ng/2024/11/15/underfunding-inadequate-infrastructure-hindering-educational-development-in-nigeria-alli/?

Dwivedi, Y. K., Hughes, D. L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Edwards, J. S., Eirug, A., & Galanos, V. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 57*, 101994. 1-47.

Ebekozien, A., Hafez, M. A., Aigbavboa, C., Samsurijan, M. S., Al-Hasan, A. Z., & Nwaole, A. N. C. (2024). Appraising education 4.0 in Nigeria's higher education institutions: A case study of built environment programmes. Sustainability, 16(20), 8878.

Ebiringa, O. T., Ikerionwu, C. O., Erike, A. I., & Asiegbu, B. C. (2025). Generative AI adoption in Nigerian higher education: Benefits, challenges, and opportunities. *African Journal of Humanities and Contemporary Education Research, 20*(1), 285-304.

Eleje, L. I., Ezeugo, N. C., Esomonu, N. P. M., Metu, I. C., Anierobi, E. I., Mbelede, N. G., Nwosu, K. C., Ezeonwumelu, V. U., Ufearo, F. N. & Eleje, G.I. (2025). Artificial intelligence adoption in higher education in Nigeria. *Discover Artificial Intelligence, 5*, 335.

European Commission (2023). *Digital Education Action Plan 2021–2027: Progress report on digital pedagogy and teacher competence development*. Brussels: European Commission. Available at: https://education.ec.europa.eu (Accessed: 17 April 2026).

Filani O. M., Olajide J. O., & Osho, G. O. (2023). Artificial intelligence in demand forecasting and inventory optimisation. *International Journal of Advanced Multidisciplinary Research and Studies.* 3(6):1930-1948.

Fomunyam, K.G. (2022). The itinerant curriculum as a key to responsiveness in the era of the fourth industrial revolution in Nigerian higher education. *International Journal of Learning, Teaching and Educational Research,* 21(7), 397-409.

Ibrahim, A.-W., Taura, A. A., Iliyasu, A., Shogbesan, Y. O., & Lukman, S. A. (2024). Artificial intelligence: Perception and utilisation of AI technologies in educational assessment in Nigerian universities. *Edukasiana: Jurnal Inovasi Pendidikan,* 3(3), 367-380.

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103,* 1-9.

Katsamakas, E., Pavlov, O. V., & Saklad, R. (2024). Artificial intelligence and the transformation of higher education institutions. *arXiv*. https://arxiv.org/abs/2402.08143

Ladimeji, O.A. (2020). The fourth industrial revolution in Nigeria: A policy conundrum and high stakes for the future of the African continent. *The thinker 83(1). 34-41.*

Luwoye, A., Ahmed, A. T., Ibrahim, Y.O., & Abdulraheem, J.A. (2024). Challenges and opportunities of artificial intelligence integration into the Nigerian university system. 1(5):48-54.

Maluleke, A. F. (2025). AI adoption in African higher education: A systematic review of benefits and ethical implications. *Interdisciplinary Journal of Education Research, 7*(2), 1-17.

Masike, M.M. (2026). Bridging the AI divide in sub-Saharan Africa: Challenges and opportunities for inclusivity. Accessed from https://arxiv.org/abs/2601.06145?

Mezher, M. A., Gunawan, I., & Fayezi, S. (2026). Lean 4.0 as a Socio-Technical System: Mapping the Interaction of Soft Practices and Industry 4.0 in Digital Transformation. *Systems,* 14(1), 9.

Mhlanga, D. (2022). Human-Centered Artificial Intelligence: The Superlative Approach to Achieve Sustainable Development Goals in the Fourth Industrial Revolution. *Sustainability*, 14(13), 7804.

Mosha, N. F. V., Chigwada, J., Ketchiwou, G. F., & Ngulube, P. (2026). A Systematic Review of Artificial Intelligence in Higher Education Institutions (HEIs): Functionalities, Challenges, and Best Practices. Education Sciences, 16(2), 185.

National Universities Commission (NUC). (2022). Current list of Nigerian universities. Retrieved on 13th March, 2026, from https://www.nuc.edu.ng/#:~:text=Total%20Number%20of%20Universities%20*%20Federal%20Universities,(67)%2021.7%25%20*%20Private%20Universities%20(168)%2054.2%25

Nnaji, I. L., Ayanwale, M. A., Ukeje, I. O., Ekwunife, R. A., Igwe, C. M., Okwor, E. O., & Nwuzor, C. I. (2026). Enhancing governance and performance in Nigerian higher education through AI-driven digital transformation: Insights from stakeholder perspectives. *Social Sciences and Humanities Open*, *13*. Accessed from https://doi.org/10.1016/j.ssaho.2025.102348

OECD Digital Education Outlook (2023). *Towards an effective digital education ecosystem.* accessed from https://www.oecd.org/en/publications/oecd-digital-education-outlook-2023_c74f03de-en/full-report/towards-a-digital-transformation-of-education-distance-travelled-and-journey-ahead_84a6abf5.html?

Oguntona, O. A., & Emere, C. E. (2025). Mapping the landscape of artificial intelligence in teaching and learning across African higher education. *Interdisciplinary Journal of Education Research, 7*(2). https://doi.org/10.38140/ijer-2025.vol7.2.17

Okoye, K., & Nwaogbe, O. R. (2022). Digital transformation and higher education development in Sub-Saharan Africa. *Education and Information Technologies, 27*, 1–21.

Olan, F., Arakpogun, E. O., Suklan, J., Ouyang, X., & Ribeiro-Navarrete, S. (2022). Artificial intelligence and knowledge sharing: Organisational performance implications. *Journal of Business Research, 145*, 805–817.

Petrova, N. (2026). Digital transformation is a socio-technical reconfiguration of business strategy, innovation, and value creation. *International Journal of Business and Management Sciences.* 6(2).

Plooy, D.E., Casteleijn, D., & Franzsen, D. (2024). Personalised adaptive learning in higher education: A scoping review of key characteristics and impact on academic performance and engagement. *Heliyon*, *10*(21), e39630. https://doi.org/10.1016/j.heliyon.2024.e39630

Premium Times (2026). Blackout across Nigeria as national grid collapses. Accessed on 15th March 2026, from https://www.premiumtimesng.com/news/headlines/852419-updated-blackout-across-nigeria-as-national-grid-collapses.html

Rekab, A. (2025). The socio-technical foundations of digital transformation in media organisations: A theoretical framework for performance enhancement. *Algerian Scientific Journal Platform.* 18(2), 752-773.

Rekai Zenda & Alton Dewa. (2025). Artificial intelligence for enhanced student engagement in South African open distance learning: A systematic review. *Sabinet Africa Journal.* 46(1). 1-25.

Samuel, N.N., Akorede, O.J., & Karimu, A.Y. (2025). Artificial intelligence for inclusive education in Nigeria: Systemic challenges and bridging the 21st-century digital divide. *Zamfara International Journal of Sci. Tech. Educ. & Mathematics.* 2(2). 157-165.

Samuels, A.B. & Singh, U., 2025, 'Education reimagined: South Africa's journey through the 4IR and beyond', *Transformation in Higher Education* 10(1), a482. https://doi.org/10.4102/the.v10i0.482

Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Polity Press. Accessed from https://www.scirp.org/reference/referencespapers?referenceid=3627290

Tchamyou, V. S. (2020). The role of knowledge economy in African business. *Journal of the Knowledge Economy, 7(3)*, 1-42.

Thabisa Maqoqa, (2025). The intersection of AI and learning analytics: Enhancing institutional performance. *Interdisciplinary Journal of Education Research,* 7(1), 1-27.

Ukwandu, E. A., Okafor, E. N. C., Ikerionwu, C., Olebara, C., & Ugwu, C. (2021). Cybersecurity in the emerging world of smart everything. *arXiv*. Accessed from https://arxiv.org/abs/2109.05821

UNESCO (2024) *AI competency framework for teachers*. Paris: UNESCO. Available at: https://www.unesco.org (Accessed: 17 April 2026).

UNESCO, (2025). *UNESCO survey: Two-thirds of higher education institutions have or are developing guidance on AI use*. Accessed from https://www.unesco.org/en/articles/unesco-survey-two-thirds-higher-education-institutions-have-or-are-developing-guidance-ai-use?

UNESCO. (2021). *AI and education: Guidance for policymakers*. United Nations Educational, Scientific and Cultural Organisation. https://unesdoc.unesco.org/ark:/48223/pf0000376709

Wang, S., Wang, F., Zhu, Z., Wang, J., Tran, T., & Du, Z. (2024). Artificial intelligence in education: A systematic literature review. *Expert Systems with Applications, 252(1)*, 124167. https://doi.org/10.1016/j.eswa.2024.124167

Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology, 45*(3), 223–235. https://doi.org/10.1080/17439884.2020.1798995

Yajie, Z. (2026). AI-enabled academic administration and process optimisation in higher education institutions. *International Journal of Research and Innovation in Social Science.* 10(3). 6855 -6865.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2020). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education, 16*(39). https://doi.org/10.1186/s41239-019-0171-0