Strategic leadership in higher education: Navigating the impact of artificial intelligence on university governance, teaching, and research

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ABSTRACT

This research paper explores how artificial intelligence (AI) is transforming the field of higher education, in terms of how it can improve the delivery of instruction, automate administrative processes, and open up research possibilities. A descriptive survey design of analytical nature was used, targeting academic, non-academic, and managerial workers in 20 public universities in the South-South Geopolitical Zone of Nigeria. The sample size of 800 participants was chosen using a stratified random sampling technique, comprising 400 academic staff, 350 non-academic staff, and 50 management staff. Three research questions and hypotheses guided the study, along with the Artificial Intelligence in University Leadership Questionnaire (AIULQ), a validated 20-item tool with a reliability coefficient of 0.81, obtained through Cronbach's alpha. Data analysis included calculating the mean and standard deviation of responses to research questions, and hypothesis testing at a 0.05 alpha level using One-Way Analysis of Variance (ANOVA). The results indicate that AI can enhance data-driven decision-making, virtual academic advising, and adaptive learning platforms. The paper also discusses ethical challenges such as algorithmic bias, data privacy, academic integrity, and the digital divide. It recommends that universities develop specific principles for the use of AI in research, academia, and administration. The findings are highly relevant to stakeholders, including teachers, university administrators, and educational reform policymakers.

Contribution/Originality: This research examines changing governance, teaching, and research landscapes in higher education and the strategic leadership practices that enable Artificial Intelligence (AI) to be used for innovation. This work contributes to knowledge on the benefits, challenges, and approaches for implementing AI to achieve institutional resilience and promote academic excellence.

1. INTRODUCTION

The reason artificial intelligence (AI) is redefining universities lies in its impacts because technology is not only reshaping administrations but also altering leadership structures and decision-making processes in educational sectors. In fact, AI has become a more tactical tool to improve academic performances to become efficient and competitive in today's globalized knowledge economy for university administrators. Notably, these impacts are made possible due to its data analysis capacities, prediction models, automation processes, or intelligent system capacities (Daniel, 2019). In fact, the rising effects of AI are not only technology-based but are also highly organised and pedagogically embedded. In other words, there has been a shift in how universities deliver or offer education.

Historically, university administrators' outlook involved human-centric decision-making and bureaucracy. However, nowadays, these administrators are adopting AI-based solutions to leverage these solutions to empower evidence-based decision-making, manage academic planning, or simplify administrative tasks. As a practical example, administrators can now anticipate student enrollment trends, track student participation, and finally allocate resources more effectively (Holmes, Bialik, & Fadel, 2021). In addition, universities are embracing AI-based chatbots or smart assistants. As a result, university administrators' workload will reduce due to centralized tasks, allowing them to concentrate more on strategic planning (Dwivedi et al., 2021).

In addition to these changes, AI continues to shape leadership trends by encouraging data-driven cultures and requiring skills of leaders in terms of digital competency, responsibility for ethical uses of AI technology, and adaptable strategic thinking (Luckin, 2018). The university leader faces challenges in navigating between innovation and responsibility in pursuing efforts to control both opportunities and challenges arising from digitalization (Williamson & Eynon, 2020). The trends continue to influence leadership models to be reconsidered in a way that is flexible, accommodating, and responsive to emerging societal values and technology.

The leadership focus in higher education institutions has undergone or will continue to undergo changes because of the inclusion of AI in higher education leadership. There are numerous benefits linked to implementing AI in leading a college or university. These benefits include effective decision-making, improved functioning, and enhanced student performance. There are also dangers involved in implementing AI in leading colleges and universities. In fact, more benefits are derived compared to implementing AI in other sectors.

1.1. Problem Statement

The integration of artificial intelligence (AI) into the university system can result in a complete revolution in teaching, research, administrative processes, and decision-making. At the same time, due to its rapid development, there exists a set of challenges directly related to AI implementation. Currently, AI represents an extraordinary opportunity for higher education, but some universities lack mechanisms to address AI-related issues and ensure equity concerning its implementation (Holmes et al., 2021; Zawacki-Richter, Marín, Bond, & Gouverneur, 2019).

These include a lack of preparation to develop or demonstrate strategic leadership to address the operational and social-ethical effects emerging from implementing AI. Issues such as data loss or opaque decisions made using AI are major contributors to lowering trust within the university community's academic integrity (Williamson & Eynon, 2020). The use of AI systems could potentially undervalue the human components within universities, concerning mentoring, critical thinking, or interpersonal learning activities, which are essential components in developing scholars (Luckin, 2018).

The adoption of AI integration varies significantly among different entities, particularly between those in underfunded third-world nations and universities in the Global North. Entities with limited financial resources are less capable of affording or managing AI technology, which places them at a disadvantage in the global landscape. This digital divide exacerbates inequalities in education (Dwivedi et al., 2021). Furthermore, few academic staff members are able to adapt to technology-enabled learning or utilize AI to interpret data for making well-informed decisions, primarily due to the lack of well-structured professional development courses (Daniel, 2019).

Although more scholars are engaging with AI in education discourse, there remains a significant gap concerning empirical studies related to how leaders in universities are navigating the transformative aspects of AI technology. Issues regarding how universities can thrive in the face of AI technology are yet to be resolved, as there are questions concerning the application of equitable AI policies.

The proposed study will respond to the challenge of the lack of institutional, ethical, and pedagogical frameworks to manage the emerging impacts of artificial intelligence in higher education. It looks into the emerging impacts of artificial intelligence in university leadership with reference to the benefits arising from artificial intelligence to university leadership. It examines the risks or ethical impacts arising from artificial intelligence. Finally, it examines

how university leadership can manage arising risks or ethical impacts. Without considering plans, leaders, and policies in universities, there are tendencies to convert artificial intelligence into a method to undermine equity, transparency, and principles involved in managing universities.

1.2. The Goals of the Research

The main aim of this study is to determine how AI is transforming university leadership. The research will specifically seek to.

1. Examining the benefits of artificial intelligence (AI) to university leadership.
2. Evaluating risks and ethical implications of artificial intelligence (AI) in higher education.
3. Identifying how the university leadership will address the dangers and ethical considerations of risks associated with Artificial Intelligence (AI).

1.3. Theoretical Framework

A multi-theory approach using transformational leadership theories, socio-technical system theories, and diffusion of innovation theories proficiently describes the role of artificial intelligence in university governance. These theories describe how new technologies are creating problems in colleges and universities. The current study extends past studies in recognizing the unique challenges presented to colleges and universities by AI.

Burn's Transformational Leadership Theory, as discussed by Burns (1978) and Bass (1985), posits that leaders are expected to create inspiration and stimulate intellectual resources among their followers. Consequently, innovation within organizations occurs directly. Previous studies have explored transformational leadership's impact on teaching, organizational climate, and faculty members' motivation. In recent studies, Dwivedi et al. (2021), along with other scholars such as Northouse (2019), have emphasized the importance of 'digital or AI-based transformation' in leadership. They argue that leaders must promote technological innovation, persuade individuals to adopt AI-based solutions, and create favorable conditions for ongoing innovation within organizations. Consequently, the scope of innovation leadership has shifted from a broad focus to specifically emphasizing digital or AI-based innovation in organizational contexts.

Lately, scholars have employed the use of Socio-Technical System (STS) Theory (Trist & Bamforth, 1951) to analyze how humans and technology interact in an organizational set-up. In its earlier understanding, there was a focus on improving the effectiveness and well-being of social subsystems (culture, roles, and structures) and technical subsystems (tools and systems), mediated by improved collaboration. In emerging technology adoption specifically, there was a focus on implementation in an administrative or educational setting, to the point of ignoring the role of artificial intelligence. In contrast to earlier studies, contemporary scholarship, including this one, encompasses STS theory to incorporate not only the complex synthesis between AI but also its need to be integrated with innovation, ethics, inclusivity, and organizational culture (Pasmore, Woodman, & Shani, 2019; Williamson & Eynon, 2020). In particular, there's an assertion made in this scholarly piece that AI integration needs to address academic subcultures and structures to ensure that technology does not negatively jeopardize humanist agenda objectives in education.

The Diffusion of Innovation Theory has been widely used to explore technology adoption processes in educational settings (Rogers, 2003). In this context, diffusion theory can be applied in higher education to study technology adoption, such as digital technology or e-learning system purchases among individuals. Both types of studies examine the adoption or use of AI in various ways, considering the issues and benefits associated with AI technology. University administrators are believed to have significant influence; they can leverage their positions to improve different situations. Their responsibilities include increasing awareness, encouraging positive perceptions of differences, and promoting the idea that equal access to AI technology is achievable (Zawacki-Richter et al., 2019). It represents a shift to explore complex processes involved in resistance to adoption and leadership strategies that are fundamental to enabling AI to function.

Earlier studies have focused on theories concerning technology or innovation in higher education, but this study adds to the field by exploring the three theories together to interpret the complex implications of AI in university leadership. These theories explain how relationships between transformational leadership, organisational alignment (STS), and diffusion of innovation contribute to achieving efficient AI implementation. They also emphasize that administrators must possess moral values to address issues arising from AI. In these theories, technology benefits higher education by helping to achieve its fundamental goals rather than causing harm. The study enhances these theoretical foundations by focusing on artificial intelligence and proposing new ideologies related to strategic leadership approaches for the effective implementation or adoption of AI in universities.

2. REVIEW OF LITERATURE

The development of artificial intelligence (AI) technology in higher education has presented significant opportunities and a set of challenging issues. Strategic leadership through the use of AI facilitates the management of these changes as the technology continues to evolve within university administrative operations, such as data-driven decision-making, predictive analytics, and automated administrative processes (Williamson & Piattoeva, 2019). This need to innovate with risk management extends to strategic executives, specifically concerning data privacy, algorithmic transparency, and ethical responsibility (König & Wenzel, 2021; Seldon & Abidoye, 2018). The predictors of student success based on AI should be introduced by leaders who must take into account the cost and the benefits of the implementation, so that they can be responsive to the needs of the various stakeholders (Tsai, Poquet, Gašević, Dawson, & Pardo, 2019).

Artificial intelligence can transform education by creating adaptive learning platforms that are personalized, intelligent tutoring, and automatic assessment (Luckin, Holmes, Griffiths, & Forcier, 2016). Nevertheless, regardless of the problems of faculty readiness, the digital divide, and academic dishonesty, these technologies can boost the engagement and learning outcomes of students (Daniel, 2019; Huang et al., 2023). The leadership style must be strategic to impact professional development among teachers and enable them to adopt AI technology, ensuring that curriculum adjustments aid in inculcating critical thinking and digital literacy (Seldon & Abidoye, 2018). Additionally, leaders should focus on the ethical implications of surveillance and the acquisition of information related to AI-controlled educational systems (Williamson & Piattoeva, 2019).

The AI-based tools are redefining the research space, enhancing the analysis of large data sets, automating literature reviews, and promoting interdisciplinary collaboration (Molnar, 2020; Zawacki-Richter et al., 2019). The implementation of AI in research presents challenges related to research integrity, reproducibility, and the potential reinforcement of biases in machine learning models (Floridi & Chiriatti, 2020; Holmes et al., 2021). The institutional leaders are responsible for ensuring that the policies adopted by the institution promote responsible AI research practices, encourage open scientific activity, and support the development of transparent and reproducible procedures (Huang et al., 2023; König & Wenzel, 2021). Additionally, the role of AI in university management, education, and research should be approached with preemptive and values-based strategic leadership (Bryson & Andres, 2020).

Digital literacy, ethical innovation, and a strong organizational structure are the most crucial relationships that efficient leaders should build to surmount the changing nature of the higher learning environment (Luckin et al., 2016; Williamson & Piattoeva, 2019). The literature suggests that adaptive governance, professional growth, and strong ethical frameworks have led to the efficient application of AI in higher education.

2.1. The Role of Artificial Intelligence in University Management

Artificial intelligence (AI) is revolutionizing the community of higher education because it offers university administrators advanced technology that can serve to improve planning, accelerate administrative activities, enhance academic performance of scholars, and increase innovation within universities. Artificial intelligence (AI), which encompasses machine learning algorithms, prediction analysis, natural language processing, or robotic processing,

has penetrated academic forums. As a result, administrators are bound to make decisions that are not only well-informed but also faster and more impactful compared to before.

One of the major advantages of AI in university administrations is derived from the capability of AI systems to manage massive amounts of data related to the university, such as finance reports, student performance data, and enrollment data. Predictive analytics enable university administrators to forecast trends, identify problems, and take proactive steps in hiring decisions, budgeting, staffing, and strategic allocation (Dwivedi et al., 2021). The notion presented relates to "the influence of AI & Big Data in Higher Education," focusing specifically on "the role of AI & its integrating function in terms of planning & improving decision-making in creating educational policies" (Daniel, 2019). The current paper emphasizes the use of AI-based tools to enable real-time monitoring to promote agile leadership. In fact, AI-based dashboards and learning analytics allow real-time monitoring to identify student participation and institutional-level performance, enabling dynamic adjustments to institutional policies.

Artificial intelligence (AI) can significantly enhance administrative productivity and efficiency by automating various administrative tasks. AI-powered chatbots are capable of managing tasks such as class scheduling, attendance management, grading, document processing, and responding to queries. These chatbots and virtual assistants, based on AI, are already addressing questions related to courses, thereby reducing staff workload. For instance, AI-based chatbot systems are functioning as assistants to answer queries related to course registration, and they also handle IT-related inquiries, further alleviating staff responsibilities (Holmes et al., 2021). Tasks associated with scheduling, grading, and attendance management become more streamlined with AI, allowing administrators to focus more on strategic leadership and innovation rather than staff-related issues (Dwivedi et al., 2021). The implementation of AI-driven chatbot technology in universities such as Georgia State University has proven highly effective in responding to thousands of course-related queries (McKenzie, 2017). This technological integration has contributed to a reduction in summer melt and has significantly improved enrollment rates at Georgia State University, demonstrating the positive impact of AI on administrative processes and student engagement (McKenzie, 2017).

AI can now support academicians as well as provide individualized student support to be provided by the university's administration. Adaptive learning systems or intelligent tutoring systems allow tailoring course material according to student preferences to maximize academic success. AI helps university administrators to evaluate and improve educational programs so that these become more efficient and inclusive (Luckin, 2018). With AI's help, administrators can identify struggling students in an initial phase based on academic as well as behavioral data. Later on, administrators can implement steps to improve academic success (Daniel, 2019).

AI systems are utilized in talent management and human resources in contemporary times. The increasing use of AI technology has been observed in professional development, talent assessment, and talent attraction. University administration employs algorithms in AI to estimate talent pools, evaluate candidates, and track faculty members' performances using Key Performance Indicators (KPIs). Besides identifying skill gaps and recommending training sessions to improve them, these technological systems can be helpful in the university's administrative or strategic decisions to reward or promote candidates based on merit (Chen, Xie, & Hwang, 2020). However, issues concerning biases, fairness, and transparency in algorithms remain challenges for AI-based human resources within contemporary universities. Predictive data and systems can support organizational succession planning based on trends in academic or administrative performance, enabling leaders to explore emerging opportunities for developing organizational leaders.

Moreover, AI systems foster innovation and transformation in universities. University managers are being equipped with the capability to drive innovation and technological transformations using AI. Applications of AI enable universities to design and undertake digital courses, online learning platforms, or smart campuses to enhance their competitiveness in international markets. University managers can utilize AI to improve curricula to align with emerging market needs, making graduates more job-ready. AI also helps managers achieve institutional goals by conforming to organizational data requirements or market demands, according to Dwivedi et al. (2021), who

presented a multidisciplinary analysis of AI studies. AI significantly impacts increasing efficiency and forecasting the delivery of university services. Additionally, AI boosts innovation in research activities, such as research impact analysis and literature reviews.

AI enhances the reach and competitiveness of an institution. Institutions that embrace AI will manage to compete favorably globally due to improved student services, data-driven education delivery, and efficient administrative services. AI helps institutions to enhance their ranking based on improved data collection methods, alumni monitoring, increased research contributions, and increased student accomplishments. AI is utilized to improve ranking and branding based on data-driven strategies used for internationalization (Zawacki-Richter et al., 2019).

It has been shown that data-driven governance, effectiveness in operations, student participation, effective strategic human resource management, and competitiveness in institutions can all benefit from using AI in university leadership. The above-mentioned benefits can be validated using empirical evidence indicating that innovation and changes in post-primary education can benefit to a great extent from AI. In light of these benefits to be obtained by using AI in universities or other similar types of institutions, there will need to be deliberate effort and flexible leadership behavior to ensure these goals are in line with technological developments. Thus, there will need to be input concerning staff members' perspectives related to benefits arising from applying 'artificial intelligence' in university leadership.

2.2. Artificial Intelligence: Risks and Ethical Implications of AI to University Leadership

As artificial intelligence (AI) increasingly permeates university leadership and governance systems, it offers not only transformative opportunities but also a myriad of risks and ethical challenges. There are legitimate concerns that AI could be abused, the unintended consequences of machine learning, and the larger sociopolitical implications of a data-driven leadership. AI supports innovation and advances the efficiency of institutions, but it can threaten key values in academia, such as accountability, transparency, equity, and inclusivity, when adopted or deployed without ethical safeguards.

Algorithm bias and discrimination are among the most significant ethical concerns related to AI in higher education. This issue arises when AI systems reinforce or even amplify human prejudices during their training processes. Academic evaluations and admissions procedures, as well as AI-based predictive analytics techniques, can inadvertently disadvantage certain groups based on gender, race, economic status, or disability (Eubanks, 2018; Obermeyer, Powers, Vogeli, & Mullainathan, 2019). The consequences of biased decision-making are often not immediately visible, especially in algorithms, which tend to operate as black boxes. This opacity can institutionalize discrimination within educational leadership, making it a persistent and systemic issue that requires ongoing scrutiny and intervention.

The ethical risks posed by AI include the potential loss of human judgment and control. Human-based decisions such as budget allocation, staff promotion criteria, and student assessment can be automated by AI systems. This may lead to an over-reliance on automated systems, resulting in dehumanized decision-making processes that overlook ethical, emotional, or contextual factors. Such outcomes contradict the humanistic principles of leadership and education. In their article, Williamson and Eynon (2020) highlight the ethical paradox emerging in AI in education, including concerns about algorithmic bias, data privacy, and the automation of pedagogical decision-making. Addressing these issues requires leadership models that emphasize ethical data use, inclusivity, and transparency. Additionally, stakeholder voices may be marginalized in decision-making processes, and academic principles could be compromised if leadership prioritizes algorithmic results over professionalism.

Data privacy and surveillance are significant issues associated with AI systems. University administrations are employing AI to monitor student behavior, attendance, and performance through learning analytics, biometric monitoring tools, and data tracking. The article, The Age of Surveillance Capitalism by Zuboff (2019), discusses the role of AI and big data analytics in increasing surveillance across various sectors, including education. Such practices

pose substantial risks to privacy, particularly when students and staff are unaware of how their information is collected, used, and disclosed. Zuboff (2019) highlights that pervasive surveillance can undermine trust and privacy, fostering a culture of compliance rather than intellectual freedom. The unregulated collection of data and its analysis through AI can result in the erosion of academic freedom and independence, raising concerns about the ethical implications of such surveillance practices.

The ethical issue with AI in university leadership is the lack of accountability and transparency. Most AI systems are referred to as black boxes, implying that end users do not easily understand how they work. Such a lack of explanation makes it difficult to justify decisions made with the help of AI, reducing accountability among university administrators. Institutional governance can result in stakeholders losing trust when opaque algorithms inform hiring, funding, or student outcomes decision-making. Pasquale (2015) discusses the black box of decision-making in his book Society—The Black Box and argues that organizations, such as academic institutions, must ensure that AI systems are algorithmically transparent and contestable. Due to the nature of technology, decisions made by university leaders are highly questioned because they might not understand all of them, thus raising concerns about procedural justice and dependability.

Digital inequality and barriers to access are significant ethical threats to AI in university leadership. The use of AI often increases digital inequalities both between and within institutions. Developing countries might also be disadvantaged due to universities lacking the resources or expertise to deploy and manage AI (Dwivedi et al., 2021). Moreover, AI-based performance monitoring or financial support systems can unfairly target students from low-income backgrounds, supporting systemic injustices. The expansion of educational inequalities should be prevented through intentional policy frameworks, as equitable access to AI technologies and their benefits is not guaranteed.

Finally, ethical leadership and policy vacuums are another risk that AI might pose in university leadership. Many educational institutions have adopted AI without reviewing their leadership structures or code of ethics. The problem with AI tools is that institutional guidelines to regulate them, manage data ethically, and address errors in algorithms are often absent (Floridi et al., 2018). This is due to the absence of regulations, which increases the risk of unchecked AI applications that can jeopardize the integrity of the institution. University administrators must develop robust AI governance models, incorporate stakeholder perspectives, conduct ethical audits, and establish continuous review processes.

The opportunities that AI presents to university leadership are significant, though there are multiple operational and ethical risks that must be considered. Therefore, the research will identify the perspectives of academic, non-academic, and management personnel regarding the ethical risks of artificial intelligence (AI) in university leadership. University leaders should promptly address issues such as algorithmic bias, lack of human oversight, privacy rights violations, and digital inequality. Responsible AI leadership relies on transparency, inclusivity, and accountability, supported by a well-established set of governance policies and ethical practices. There is no significant difference in the mean scores of faculty, non-academic, and management employees concerning the ethical risks of artificial intelligence (AI) in university leadership.

2.3. The University Leadership Techniques to Minimize Risks and Take into Account the Ethical Implications of Artificial Intelligence

University leadership has revolutionized strategic planning, data analytics, and service delivery due to the introduction of artificial intelligence (AI). Nevertheless, there are serious ethical concerns, such as algorithmic bias, breach of privacy, transparency deficits, and unequal access to AI tools, which mitigate these advantages. The idea to be used in order to use AI responsibly and in a sustainable way is that university leaders have to implement deliberate methods of forecasting, controlling, and mitigating these risks. These tactics should include stakeholder engagement, technical safeguards, policy innovation, and accountability of the institution.

Developing institutional structures for AI governance is a key strategy. Creating governance systems that define the parameters, standards, and oversight of AI technologies is an effective approach to mitigating AI risks in higher education. These frameworks should be based on global ethical AI principles such as accountability, transparency, fairness, and human-centeredness. This involves establishing AI Ethics Boards or Digital Ethics Committees within universities, creating AI use policies that specify where AI can be applied, outline vendor responsibilities, and detail data protection and usage requirements. Additionally, implementing AI risk assessments within existing institutional quality assurance mechanisms is essential. Floridi et al. (2018) emphasize that ethical frameworks like AI4People can guide the development and application of AI in organizations by supporting the establishment of institutional policies grounded in accountability, fairness, and transparency.

Managing the ethical risk in university leadership requires transparency and explainability (explainable AI). AI systems developed in high-stakes scenarios, especially in faculty reviews, retention, or admissions, must be understandable and interpretable. University leaders should demand transparency in the formulation of algorithms, and they cannot keep the decision-making process secret. According to Pasquale (2015), contestability and procedural justice require explicability, whereas black box algorithms are considered to compromise institutional accountability. This implies the need to audit third parties on algorithms before implementing AI tools, explain AI (XAI) models to ensure that the decision-making process is auditable, and justify the decisions made by AI to stakeholders who may be affected.

The university administration's strategy to address the ethical challenges of AI involves ensuring data privacy and obtaining informed consent. AI systems necessitate extensive data collection, which raises concerns about privacy and ethical use. Universities are governed by laws and ethical standards that emphasize data protection, privacy, and informed consent. Leadership should establish transparent data governance policies aligned with both national and international regulations, including GDPR. As Zuboff (2019) argues, the potential for AI-powered data surveillance to take control without regulation poses a threat to individual and academic freedoms. She advocates for democratic control over data usage, which includes restricting access through encryption and anonymization, assigning roles, creating clear user consent procedures, providing opt-out options, and conducting data protection impact assessments (DPIAs) prior to deploying AI tools.

The management of AI ethical risk by university leadership should focus on minimizing bias and ensuring algorithmic fairness. University administrators should actively control algorithmic bias to avoid the continuation of structural inequality. The fairness of AI systems for demographic groups requires both technical and procedural interventions. Even widely used AI models may produce racially biased outcomes, as Obermeyer et al. (2019) demonstrated, which is why ethical supervision and fairness testing are necessary. Consequently, university leaders should conduct fairness tests and bias audits regularly, train AI on diverse representative datasets, and engage underrepresented groups in AI development and assessment.

In order to handle AI ethical risks in leadership in universities, it is important to establish ethical leadership and AI literacy. To adequately regulate and control AI, university administrators and employees must be digitally literate and competent in ethical skills. This involves curriculum change and continuous professional development. Williamson and Eynon (2020) highlight ignorance of AI ethics among education leaders and argue that upskilling is one of the solutions to the gap between governance and innovation. University administrators ought to offer capacity-building courses in AI ethics and digital leadership to university executives, provide AI ethics courses to students and faculty, and conduct webinars, workshops, and seminars with legal and technology professionals.

The other strategy for managing AI ethical risk within university leadership is the promotion of stakeholder investments and inclusion. In an inclusive and ethical process of AI governance, students, teachers, staff, and outside experts should be involved in the creation, assessment, and review of AI systems and policies. Eubanks (2018) notes that participatory governance is needed to prevent AI from continuing to cause social exclusion, particularly for underprivileged groups. To achieve this, it is necessary to establish feedback loops among AI system users, discuss

AI issue planning at the level of faculty senates and student unions, and encourage more public conversations about national and international ethical concepts related to AI usage in education.

Finally, dealing with AI ethical risks in university leadership requires a joint effort at both the national and international levels. University administrators should liaise with policy institutions and align their practices accordingly to develop responsible AI norms. The UNESCO Recommendation on the Ethics of AI UNESCO, (2021) recommends that universities play a central role in the adoption of policies and provide guidelines for implementing AI in an inclusive, transparent, and human-centered manner. University leaders should publicly fund ethical AI initiatives at underserved universities, participate in national and regional consortia on AI education, and base policies on the UNESCO Recommendation on AI Ethics and OECD AI Principles.

Artificial Intelligence can transform leadership in universities, though it must be regulated using formidable institutional strategies and moral values. To deal with the threats associated with AI, a complex approach is required, such as the establishment of governance frameworks, the promotion of transparency, ensuring data privacy, minimizing bias, promoting moral leadership, ensuring stakeholder engagement, and compliance with international standards. Indeed, the research shall examine the average scores of academic, non-academic, and management personnel on approaches to mitigating the ethical risks posed by artificial intelligence (AI) in university leadership, alongside academic integrity, accountability, equity, and efficiency, as well as innovation.

3. METHODOLOGY

Research Design: We chose to employ an analytical descriptive survey as our research design for this investigation. This design is appropriate because, in addition to analyzing the respondents' opinions, it provides an unmanipulated description of current and existing phenomena.

Participants: Participants in the study were all employees of the twenty public universities in Nigeria's South-South Geopolitical Zone, including academic, non-academic, and management staff. The states in the South-South Geopolitical Zone include Delta State, with six public universities, Federal University of Petroleum Resources Effurun, Nigerian Maritime University Okerenkoko, University of Delta Abraka, University of Delta Agbor, Southern Delta University Ozoro, and Dennis Osadebe University Asaba; Bayelsa State with four public universities, Federal University Otuoke, Niger Delta University Amasomma, and Bayelsa Medical School Yanagua; Edo State with three public universities, University of Benin, Ambrose Alli University Ekpoma, and Edo State University Iyamho; Rivers State with three universities, University of Port Harcourt, Rivers State University Port Harcourt, and Ignatius Ajulu University of Education; Cross River State with two universities, University of Calabar and University of Cross River State; Akwa Ibom State with two universities, University of Uyo and Akwa Ibom State University Uyo. Using stratified random sampling, 40 employees were selected from each university, making a total sample of 800 employees from the population; 400 of these were academic staff, 350 were non-academic staff, and 50 were management staff.

Instrumentation: As a research tool, the "Artificial Intelligence in University Leadership Questionnaire (AIULQ)" was created. It consisted of two sections: Part A and Part B. While Part B covered accreditation and high-quality education, Part A gathered demographic data about the respondents. The instrument's rating scale included four points: Strongly Agree (SA-4 points), Agree (A-3 points), Disagree (D-2 points), and Strongly Disagree (SD-1 point). The tool was validated by two specialists from the University of Delta in Agbor, Nigeria. The final versions of the instrument incorporated modifications and additions to clarify the language and context. To assess the instrument's reliability, ten management staff members, twenty academic staff members, and twenty non-academic staff members who were not part of the initial sample were used. Cronbach's alpha indicated an estimated internal consistency of 0.81, which was deemed sufficient for the study.

Data Collection: When the researchers distributed the research tool, three research assistants helped them. These research assistants assisted in distributing and retrieving the research instrument.

Data analysis involved addressing the research questions using the mean and standard deviation. Items with a mean score of 2.50 or higher were accepted, while those with a score lower than 2.50 were rejected. The generated hypotheses were tested at the 0.05 alpha level using the one-way analysis of variance (ANOVA).

4. PRESENTATION OF RESULTS

4.1. Interpretation

Research question 1: What are the benefits of artificial intelligence (AI) in university leadership?

Table 1. Mean score and standard deviation of the benefits of artificial intelligence (AI) in university leadership.

S/N	Items	Mean	SD	Decision
1.	Support personalizes student services	2.37	1.084	Rejected
2.	Automating repetitive administrative tasks	3.37	0.719	Retained
3.	Support human resources and talent management	3.31	0.675	Retained
4.	Support for enhanced data-driven decision making	3.26	0.796	Retained
5.	Support innovation and transformation	2.80	1.105	Retained
6.	Enhance institutional competitiveness and global visibility	3.27	0.809	Retained

Table 1 presents the mean scores and standard deviations of respondents regarding the advantages of artificial intelligence (AI) in university leadership. Except for item one, where respondents disagreed with a mean score of 2.37, all other items in the table received high scores, with ratings exceeding 2.50, indicating strong agreement among participants. The advantages highlighted include enhancing data-driven decision-making, automating repetitive administrative tasks, supporting talent and human resource management, fostering innovation and change, and increasing institutional competitiveness. However, respondents did not agree that one benefit of AI in university administration was its capacity to support individualized student services.

Research question 2: What are the ethical risks of artificial intelligence (AI) in university leadership?

Table 2. Mean score and standard deviation of the ethical risks of artificial intelligence (AI) in university leadership.

S/N	Items	Mean	SD	Decision
7.	Loss of human judgment and oversight	2.22	0.992	Rejected
8.	Algorithmic bias and discrimination	3.05	0.947	Retained
9.	Data privacy and surveillance	3.00	0.970	Retained
10.	Lack of privacy and accountability	2.62	1.067	Retained
11.	Digital inequality and access barriers	3.09	0.970	Retained
12.	Ethical leadership and policy vacuums	2.95	1.038	Retained

Table 2 shows the mean scores and standard deviations of the respondents concerning the ethical risks of AI in university leadership. Except for item 7, where respondents disagreed with a mean score of 2.22, all items in the table had high scores and were rated higher than 2.50, indicating that the participants strongly agreed with the statements. Ethical risks associated with AI include algorithmic bias, discrimination, data privacy and surveillance, lack of privacy and accountability, digital inequality and access barriers, ethical leadership, and policy gaps. The respondents disagreed that one of the ethical risks of artificial intelligence is that it lacks human oversight and judgment.

Research question 3: What are the strategies for managing ethical risks of artificial intelligence (AI) in university leadership?

Table 3 shows the respondents' mean scores and standard deviations for the methods of controlling the ethical risks of AI in higher education leadership. The results indicated a high level of agreement with the statements made by the participants, with each item in the table from 13 to 18 on the respondents' scores exceeding 2.50. Furthermore, the responses were highly acceptable, indicating the methods used by university leadership to manage the ethical risks associated with artificial intelligence. These include creating a framework for institutional governance, fostering

explainability and transparency, protecting consent and data privacy, guaranteeing algorithmic fairness and bias reduction, cultivating ethical leadership and AI literacy, and fostering stakeholder participation and inclusion.

Table 3. Mean score and standard deviation of the strategies of managing ethical risks of artificial intelligence (AI) in university leadership.

S/N	Items	Mean	SD	Decision
13.	Developing an institutional governance framework	2.83	1.042	Retained
14.	Promoting transparency and explainability	2.89	1.021	Retained
15.	Safeguarding data privacy and consent	2.99	0.991	Retained
16.	Ensuring algorithmic fairness and bias mitigation	3.19	0.848	Retained
17.	Building ethical leadership and AI literacy	3.02	1.017	Retained
18.	Encouraging stakeholders' participation and inclusion	2.94	1.064	Retained

Hypothesis 1 (Ho₁): There is no significant difference between the mean scores of management staff, academic staff, and non-academic staff on the benefits of artificial intelligence (AI) in university leadership.

Table 4. One-way analysis of variance (ANOVA) on the mean scores of management staff, academic staff, and non-academic staff on the benefits of artificial intelligence (AI) in university leadership.

Benefits	Sum of squares	Df	Mean square	F	Sig.
Between groups	19.205	2	9.603	1.658	0.191
Within groups	4617.275	797	5.793		
Total	4636.480	799			

Note: $\alpha = 0.05$

An F value of 1.658 and a p value of .191 were displayed in Table 4. The p-value exceeds the alpha level when testing at an alpha level of .05. Therefore, it is decided to stick with the null hypothesis, which claims that there is no discernible difference between the mean scores of academic, non-academic, and management staff regarding the advantages of artificial intelligence (AI) in university leadership. This indicates that the mean scores of academic, non-academic, and management staff regarding the advantages of artificial intelligence (AI) in university leadership do not differ significantly.

Hypothesis 2 (Ho₂): There is no significant difference between the mean scores of management staff, academic staff, and non-academic staff on the ethical risks of artificial intelligence (AI) in university leadership.

Table 5. One-way Analysis of Variance (ANOVA) on the mean scores of management staff, academic staff, and non-academic staff on the ethical risks of artificial intelligence (AI) in university leadership.

Ethical risks	Sum of squares	Df	Mean square	F	Sig.
Between groups	83.641	2	41.821	3.516	0.030
Within groups	9479.578	797	11.894		
Total	9563.219	799			

Note: $\alpha = 0.05$

An F value of 3.516 and a p value of.030 were displayed in Table 5. The p-value is below the alpha level when testing at an alpha level of 0.05. Therefore, the null hypothesis, according to which the mean scores of academic, non-academic, and management staff regarding the ethical risks of artificial intelligence (AI) in university leadership do not differ significantly, is rejected. This indicates that the mean scores of academic, non-academic, and management staff regarding the ethical risks of artificial intelligence (AI) in university leadership differ significantly. As a result, post hoc analysis is necessary to identify the differences.

The mean scores of management, academic, and non-academic staff regarding the ethical risks of artificial intelligence (AI) in university leadership were subjected to post hoc analysis using Least Significant Difference (LSD), as shown in Table 6. At a p-value of 0.913, it revealed a mean difference of 1.348 between academic and non-academic staff, which was not significantly different from management staff. Consequently, the average difference between

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academic and non-academic staff regarding the ethical risks of artificial intelligence (AI) in university leadership is represented by this figure.

Table 6. Post Hoc Analysis on mean scores of management staff, academic staff, and non-academic staff on the ethical risks of artificial intelligence (AI) in university leadership.

(I) Staff	(J) Staff	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
Management	Academic	−1.348	0.517	0.009	−2.36	−0.33
	Non-academic	−1.320	0.521	0.012	−2.34	−0.30
Academic	Management	1.348	0.517	0.009	0.33	2.36
	Non-academic	0.027	0.252	0.913	−0.47	0.52
Non-academic	Management	1.320	0.521	0.012	0.30	2.34
	Academic	−0.027	0.252	0.913	−0.52	0.47

Note: The mean difference is significant at the 0.05 level.

Hypothesis 3 (Ho₃): There is no significant difference between the mean scores of management staff, academic staff, and non-academic staff on the strategies for managing ethical risks of artificial intelligence (AI) in university leadership.

Table 7. One-way analysis of variance (ANOVA) on the mean scores of management staff, academic staff, and non-academic staff on the strategies of managing ethical risks of artificial intelligence (AI) in university leadership.

Strategies	Sum of squares	Df	Mean square	F	Sig.
Between groups	94.086	2	47.043	3.395	0.034
Within groups	11044.789	797	13.858		
Total	11138.875	799			

Note: $\alpha = 0.05$

An F value of 3.395 and a p value of 0.034 were displayed in Table 7. The p-value is below the alpha level of 0.05. Therefore, the null hypothesis, which states that there is no discernible difference in the mean scores of academic, non-academic, and management staff regarding the methods of handling the ethical risks associated with artificial intelligence (AI) in university leadership, is rejected. This indicates that the mean scores of these groups on the methods of handling the ethical risks of AI in university leadership differ significantly. As a result, post hoc analysis is necessary to identify the specific differences.

Table 8. Post Hoc Analysis on mean scores of management staff, academic staff, and non-academic staff on the strategies of managing ethical risks of artificial intelligence (AI) in university leadership.

(I) Staff	(J) Staff	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
Management	Academic	−1.380	0.558	0.014	−2.48	−0.28
	Non-academic	−1.446	0.563	0.010	−2.55	−0.34
Academic	Management	1.380	0.558	0.014	0.28	2.48
	Non-academic	−0.066	0.272	0.809	−0.60	0.47
Non-academic	Management	1.446	0.563	0.010	0.34	2.55
	Academic	0.066	0.272	0.809	−0.47	0.60

Note: The mean difference is significant at the 0.05 level.

The mean scores of management, academic, and non-academic staff regarding the methods of handling the ethical risks of artificial intelligence (AI) in university leadership were subjected to post hoc analysis using Least Significant Difference (LSD), as indicated in Table 8. At a p-value of 0.809, it revealed a mean difference of -0.066 between academic and non-academic staff, which was not significantly different from management staff. Consequently, there is a mean difference between academic and non-academic staff regarding the methods used by university leadership to manage the ethical risks associated with artificial intelligence (AI).

5. DISCUSSION OF RESULTS

The interpretation of the study results was logically organized based on the main themes emerging from the data obtained, and the results were contextualized by reference to the existing literature. The answers to the research

questions indicate that artificial intelligence (AI) has both advantages and drawbacks in the administration of universities.

The statistics indicate that AI technologies are perceived to play a significant role in data-driven decision-making, administrative routines, talent and human resource management, institutional innovation, and competitiveness. These findings are consistent with Dwivedi et al. (2021), who observed the efficiency AI can provide to university operations, such as scheduling, attendance tracking, and grading, thereby enabling university leaders to focus more on strategic innovation rather than daily tasks. Daniel (2019) also emphasized the potential of AI to enhance academic planning and policy development.

Nevertheless, the research had its own significant weaknesses, especially regarding the field of customized student services. Table 1 depicts that AI seems to have a minor role to play in facilitating personalized interaction with students and early detection of at-risk students. This finding conflicts with what is stated in some parts of the more optimistic literature, including the works by Daniel (2019), by highlighting a continued disconnect between the potential of AI to be utilized in a student-centered approach and the current state of its practical application in higher education.

The second research question of the study explored ethical issues related to AI in university leadership, including concerns such as lack of human supervision, algorithmic prejudice and discrimination, data privacy and surveillance, digital disparities, ethical leadership, and policy gaps. Among the findings, unlike the first hypothesis, statistically significant differences were found between academic, non-academic, and management personnel in their perception of ethical risks. Although post hoc analysis showed that these mean differences were not generally significant, there were subtle differences in perspective. Eubanks (2018) and Obermeyer et al. (2019) also support these findings by pointing out the risks of algorithmic opacities in maintaining bias in fields such as faculty rating, admissions, and predictive analytics. Williamson and Eynon (2020) also highlight the constant anxieties about transparency and inclusiveness, and the inappropriateness of stakeholder interests as AI progressively infiltrates educational governance. Pasquale (2015) laments the dominance of opaque, black box algorithms and demands more transparency and contestability, which is also reflected in the findings of the current research.

The third research question addressed ways of managing the ethical risks of AI in university leadership. The findings highlight several best practices, including the development of effective governance systems, proactive support for the explainability of algorithms, data privacy protection, systematic reduction of bias, ethical leadership, and effective stakeholder engagement. The hypothesis that perceptions of ethical risk management would not significantly differ among staff groups was not supported; post hoc tests revealed some differences, though these were not statistically significant. This aligns with Floridi et al. (2018), who recommend integrating ethical principles into AI policy development, and with Eubanks (2018), who emphasizes participatory governance as an effective measure to prevent social marginalization. The paper also underscores the increasing importance of incorporating diverse stakeholder perspectives, such as faculty, senate, and student unions, into AI governance frameworks, a trend gaining prominence in contemporary literature.

Although past research mostly focuses on the technical and operational efficiencies provided by AI (Daniel, 2019; Dwivedi et al., 2021) recent work and the current results indicate that more attention is paid to the social, ethical, and governance aspects of AI that are present in higher education contexts (Eubanks, 2018; Luciano Floridi et al., 2018; Williamson & Eynon, 2020). This paper contributes to the literature because it not only states the undeniable importance of AI in administrative tasks but also highlights a growing concern regarding ethical issues and governance risks. The findings indicate a general trend in scholarly discussion, which involves a shift from unquestioning technological optimism to a more critical, multidimensional evaluation of AI's role in university governance, teaching, and research.

Overall, the discussion shows that AI implementation in higher education administration has evident benefits to operations, but there are still many gaps in the field of customized student services and moral management of artificial

intelligence. The results suggest the need for universities to take a step further and go beyond the technical application of AI by participating in the creation of inclusive governance structures, sound ethical management, and open decision-making procedures. It is only through such comprehensive methods that the benefits of AI can be maximized by higher education institutions, and the interests and rights of all stakeholders preserved.

5.1. The Implications of the Study

The conclusions of the study concerning the evolving role of artificial intelligence (AI) in the leadership of universities have significant implications for future studies, academic policy-making, institutional leadership, and technology in higher education. The application of AI requires a strategic, ethical, and inclusive leadership style because it is still changing key stakeholder relationships, systems of operations, and decision-making in higher education. The research states that AI can significantly enhance the effectiveness of leadership by automating processes, predictive analytics, and decision-making based on data. This means that university leaders now bear extra responsibilities, e.g., capacity building, ethical stewardship, and strategic digital transformation. University leadership needs to change its traditional managerial roles to transformational leaders who understand the complex world of artificial intelligence to lead institutions through the complex world of technology and ethics.

The study findings are a call for comprehensive policy responses to manage AI in education. These include the establishment of institutional AI governance systems, revision of legal and regulatory frameworks to address emerging issues, and the definition of institutional, national, and regional AI ethics to regulate AI use. Educational policymakers should take the initiative in creating ethical and regulatory frameworks to ensure the responsible use of AI and to safeguard academic freedom and equity.

The study indicated that AI can transform student support systems, curriculum delivery, and pedagogy. To reinforce this, teachers require predictive analytics to identify at-risk students early, and as an immediate response, automated feedback and tutoring systems to enhance the efficiency of instruction, and personalized learning systems that adapt to the needs and learning preferences of each student. When integrating AI tools into teaching and learning, academic leaders and curriculum designers must ensure that the tools are used to promote access, inclusivity, and student agency.

The findings of the study draw attention to the fact that AI is a paradigm shift in the leadership and governance of universities, not merely a technical development. Universities must tap into the potential of AI to remain competitive in the global market. Equally, policymakers, university leaders, and students should collaborate to ensure that AI promotes educational activities without betraying the main objectives of university education.

5.2. Study Limitations

There are certain limitations regarding the evolving impact of artificial intelligence (AI) on higher education. These limitations affect the generalizability, comprehensiveness, and applicability of the findings since they are inherent in the scope, methodology, and context of the research. It is very important to understand these limitations in a bid to create transparency and even guide future work in order to address existing gaps.

The research could have focused on a very geographic focus (i.e., a specific country, region, or type of institution) that restricts the generalizability of the findings to other regions with different economic, technological, or educational frameworks. As an example, AI may not be implemented in universities in developing countries because of policy- and infrastructure-related challenges that are not evident in more technologically advanced environments.

The rapid progress of AI technologies makes the study less applicable in the long term. Soon after the research time frame, some of the AI tools that are being investigated could be substituted, become out-of-date, or even significantly enhanced, which can render certain analyses outdated. A small or non-representative sample of the administrators, teachers, or students may also distort the results. The presence of tech-savvy participants, in turn, may over-represent the results in favor of the more desirable attitude toward AI.

As AI in education is an interdisciplinary issue, the research might not have included a comprehensive theoretical framework to encompass administrative, pedagogical, ethical, and technological elements in this study. It could have resulted in the oversimplification of complex issues or the analysis of these issues in parts. The term artificial intelligence is one that is dynamic and evolving. It could have influenced the consistency and reliability of the collected data because the respondents (or even the researchers themselves) might have possessed different levels of understanding.

Even though the studies on the transformative impact of AI on higher education have made substantial contributions to the topic, they are limited by several conceptual, methodological, and contextual problems. It is these limitations that highlight the importance of bigger, longer-term, and multi-disciplinary studies in future research and caution in generalizing the findings. By acknowledging these limitations, researchers, decision-makers, and leaders in the field of education will be able to understand the findings better and develop more successful plans to implement AI in higher education in a sustainable and responsible way.

6. CONCLUSION

The teaching, assessment, management, and experience of knowledge in higher education have radically changed due to the increasing presence of artificial intelligence (AI) in university education. This study has found that artificial intelligence (AI) is not merely a technology but a paradigm that is transforming administrative, ethical, policy, and pedagogical paradigms of modern universities.

Among the greatest impacts of AI is that it can be used to facilitate personalized learning pathways that promote inclusive learning and address a variety of learning requirements. The productivity of institutions has improved due to AI's ability to automate repetitive administrative work, allowing academic and non-academic staff to engage in more strategic and creative tasks. Furthermore, AI has become an inseparable component of information-based decision-making, enabling colleges to track academic gains, forecast student achievements, and design interventions that can minimize dropout rates.

Despite all the opportunities, there are also tremendous challenges and ethical dilemmas in the research. These include the existence of potential deterioration of academic honesty, resistance by the faculty, digital disparity, algorithm biases, and privacy breaches. The fact that we are becoming more and more dependent on AI is leading to the fact that educational values and human judgment, as the essential part of the educational process, seem to be challenged, as well as the digital gap between those institutions that have enough resources to invest in technology and those that appear not to be questioned at all.

The success of institutions in coping with the application of AI will determine the future of AI in higher education, according to this study. Institutions of higher learning must develop strong ethical policies, invest in digital governance, train their employees, and spread the notion of AI literacy to everyone in the institution in order to reap the benefits of AI and mitigate its risks. To promote the sensible use of AI in learning, lawmakers will be required to promulgate small, context-based laws.

Lastly, AI could improve education and not rob the human factor. Higher education academic quality, equity, and the humanistic goals should continue to be the major concerns when AI is developed. Such a moderate course of action will make AI in higher education an aid to innovation, openness, and global competitiveness.

6.1. Suggestions

The detailed and carefully considered recommendations below are proposed in light of the study findings and the implications of the transitioning role of artificial intelligence (AI) in higher education.

1. Universities are supposed to develop clear-cut rules that govern AI applications in research, administration, and academia. These frameworks are required to include standards on algorithmic accountability, transparency, data privacy, and intellectual property rights.

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2. Educational ministries and regulatory agencies should collaborate with academic institutions to develop national or regional AI-in-education policies that would be tailored to the local context, infrastructure needs, and workforce needs.

3. The social sciences, humanities, education, and health sciences should also integrate knowledge about AI other than the technology disciplines. The knowledge of AI principles, ethical issues, and social impacts are all important pillar of fundamental AI literacy.

4. Regular training and workshops on the use of AI-based tools such as analytics dashboards, AI-based research assistants, and adaptive learning platforms should be conducted for the academic and administrative staff to enhance their use and preference.

5. AI must be created and utilized alongside human education, and not instead of it. One should also encourage the implementation of hybrid models that combine AI and human directions and supervisory actions.

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