TECHNOLOGY ENHANCED EDUCATION LEADERSHIP: EXPLORING THE POTENTIAL OF ARTIFICIAL INTELLIGENCE IN SCHOOL ADMINISTRATION IN AFRICA

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ABSTRACT

The study investigated the integration of Artificial Intelligence in school administration in Enugu State, Nigeria. A descriptive survey design was employed. The study adopted four research questions. The population comprised 2,600 school administrators, and a sample of 260 respondents, representing 10% of the population, was selected using proportionate stratified and simple random sampling techniques to ensure representativeness across school categories and locations. Data were collected using a structured instrument titled: *Technology-Enhanced Education Leadership Questionnaire* (TEELQ), which was developed by the researcher. The instrument underwent face validation by three experts, two from the Department of Educational Foundations and one from the Research, Measurement and Evaluation Unit, Department of Science Education, all in the Faculty of Education, University of Nigeria, Nsukka. The reliability of the instrument was confirmed using Cronbach's Alpha, which yielded a coefficient of 0.82, indicating high internal consistency. The data were analyzed using mean and standard deviation, with a cut-off mean of 2.50 used as the decision benchmark on the 4-point scale. The findings of the study revealed that Artificial Intelligence was utilized to a low extent in school administration. Major challenges hindering its integration included poor digital infrastructure, lack of technical expertise among administrators, and inadequate funding. The study also revealed that AI offers high potential for enhancing administrative efficiency and supporting data-driven decision-making. Based on the findings, the study recommended targeted investment in infrastructure, continuous professional development for school leaders, and the formulation of clear, context-relevant policies to facilitate the integration of AI in school leadership practices.

Keywords: Artificial intelligence, educational leadership, school administration, digital infrastructure, policy and training

Introduction

The 21st century has witnessed a rapid transformation in the way educational institutions are managed, driven largely by advances in technology. One of the most profound technological innovations influencing contemporary educational leadership is Artificial Intelligence. Artificial Intelligence refers to the development of computer systems capable of performing tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation (Russell and Norvig, 2010). In the context of education, Artificial Intelligence offers a new frontier in administrative efficiency, data-informed decision-making, and the personalization of learning experiences. These emerging capabilities signal a paradigm shift in the way school leadership functions, particularly in regions like Africa where education systems are still grappling with fundamental structural challenges. Artificial Intelligence is increasingly recognized as a powerful tool capable of transforming educational administration by optimizing decision-making processes, automating routine tasks, and enhancing both

instructional delivery and teacher development. For instance, Brynjolfsson and McAfee (2014) affirm that Artificial Intelligence has the potential to revolutionize education by making it more personalized, efficient, and responsive to learner needs. Similarly, Gulamhussein (2013) highlights how Artificial Intelligence can offer tailored learning experiences and reduce administrative burdens, thereby allowing school leaders to focus more on instructional leadership. Furthermore, Dziuban, Moskal, and Hartman (2018) underscore the capacity of Artificial Intelligence-driven leadership to support real-time, data-driven decisions that improve student outcomes and foster innovative pedagogical practices. However, alongside these potentials, several scholars caution against an uncritical adoption of Artificial Intelligence in education. Selwyn (2016) emphasizes the importance of understanding the limitations, ethical considerations, and unintended consequences of Artificial Intelligence tools in school contexts. O'Neil (2016) argues that Artificial Intelligence systems, when poorly designed or inadequately contextualized, may perpetuate existing inequalities or introduce new forms of bias. Warschauer (2004) further warns that disparities in technological access could deepen the digital divide between well-resourced and under-resourced schools, particularly in developing regions. These cautionary views necessitate a balanced exploration of Artificial Intelligence in school administration, especially within the African context where infrastructural and socio-economic challenges are prevalent.

Globally, the economic potential of Artificial Intelligence is significant. According to a report by PricewaterhouseCoopers (2017), Artificial Intelligence technologies could contribute up to $15.7 trillion to the global economy by 2030, with $6.6 trillion attributed to increased productivity and $9.1 trillion to consumer-side effects. Yet, the distribution of these gains remains uneven. While North America, Europe, and China are projected to benefit substantially, with estimated gains of $3.7 trillion, $1.8 trillion, and $7.0 trillion respectively, African, Oceanic, and low-income Asian markets are anticipated to receive only about $1.2 trillion. These projections highlight Africa's relatively nascent stage in the development and deployment of Artificial Intelligence technologies, a gap that has implications for its educational systems and administrative capacities. Even though these disparities, educational leaders across Africa are beginning to explore the strategic integration of Artificial Intelligence in school management. Fullan (2016) suggests that Artificial Intelligence can support school leaders in improving teaching quality, streamlining processes, and focusing on learner outcomes. Corbett, Koedinger, and Anderson (2010) demonstrate how Artificial Intelligence-powered tutoring systems can provide individualized support for students, thereby complementing human instruction. These examples illustrate the transformative potential of Artificial Intelligence in reshaping educational leadership across the continent. Nonetheless, the successful implementation of Artificial Intelligence in African educational systems must be context-sensitive. As observed by Kiemde and Kora (2020, 2021), various structural and socio-cultural challenges including limited digital infrastructure, inadequate policy frameworks, insufficient data systems, and funding constraints hinder the adoption of Artificial Intelligence in Africa. Additionally, the design and deployment of Artificial Intelligence systems must reflect the values, goals, and educational priorities of African societies. To realize the full potential of Artificial Intelligence in education leadership, coordinated efforts among policymakers, educators, technologists, and communities are essential in creating an enabling environment for Artificial Intelligence to thrive within African schools.

The integration of Artificial Intelligence into various sectors has gained significant momentum globally, reshaping how societies function and how institutions are managed. In Africa, Artificial Intelligence is gradually transforming the educational, economic, political, and social landscapes through its diverse applications. As Borenstein and Howard (2021) affirm, the adoption of Artificial Intelligence is rapidly expanding across the globe. Similarly, Luan, Ching, and Hsiu-Chuan (2020) highlight how Artificial Intelligence is influencing African systems through innovations that impact everyday life. Examples include healthcare chatbots in Kenya that offer diagnostic support without physical consultations, and data-driven platforms like Zenvus in Nigeria that support agricultural productivity by delivering real-time insights to farmers (Francesc, Claude, & Said, 2019). Financial platforms such as Mama Money and Mukuru in South Africa facilitate seamless money transfers across African borders, while Kudi, a Nigerian chatbot, is designed to enhance financial inclusion among underserved populations (Kudi, 2018).
Despite these advances, the adoption and utilization of Artificial Intelligence in Africa remain limited when compared to more technologically advanced regions. Schoeman, Ncube, and Van Belle (2021) observe that the pace of Artificial Intelligence integration is uneven across the continent, with various structural, infrastructural, and policy-related challenges slowing its spread. One critical barrier is the shortage of relevant skills, particularly programming and digital competence. Bianco (2021) identifies the lack of technical expertise as a major impediment to effective Artificial Intelligence adoption. Similarly, Komarova, Almirall, and Wareham (2019) emphasize that Information and Communication Technology (ICT) efficacy and programming skills are necessary competences for successful Artificial Intelligence implementation.

Moreover, Artificial Intelligence systems often reflect biases embedded in their training data or the designers' assumptions, which can lead to the perpetuation of social inequalities. This is particularly concerning in Africa, where many Artificial Intelligence applications are imported and developed with data that may not accurately reflect local populations. As noted by Hume (2017), such bias risks marginalizing significant segments of African societies and reinforcing systemic disparities. Some African countries, including Mauritius, Zambia, Tunisia, Botswana, and Egypt, have begun to recognize the economic and developmental potential of Artificial Intelligence by formulating national strategies to guide its use. Additionally, countries such as Nigeria, South Africa, and Kenya have enacted data protection laws to support digital governance. However, these initiatives are still at an early stage, and the overall development of Artificial Intelligence governance frameworks across the continent remains in its infancy (Pedro, Oketch, & Dione, 2019; Effoduh, 2020). In the context of education, particularly higher education, emerging research is beginning to explore the determinants of Artificial Intelligence adoption. Chatterjee and Bhattacharjee (2020) reportED that individual attitudes significantly influence the intention to use Artificial Intelligence tools in higher education. Similarly, Okonkwo, Oladele, and Eze (2019) demonstrate that user perception plays a crucial role in the adoption of software applications, suggesting that stakeholder attitudes are central to the successful implementation of Artificial Intelligence solutions. However, Africa's slow infrastructural development and limited mobile technology coverage continue to impede widespread adoption (Marino Garcia & Kelly, 2015).

Hence, to guide the integration of technology into educational leadership, several theoretical models have been proposed. One of the most referenced is the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes the intersection of technology, pedagogy, and content as key components of effective technology

integration. Research has shown that educational leaders with a strong understanding of the TPACK framework are better positioned to implement technology-based reforms in their schools. Other models such as the Substitution, Augmentation, Modification, and Redefinition (SAMR) model and the Technology Integration Planning (TIP) model offer structured approaches to embedding technology into educational leadership. The TPACK-based Professional Development (TPACK-PD) model, for instance, focuses on building leaders' capacity through targeted training and mentorship. These frameworks provide useful strategies for school administrators to adopt technology in leadership practices in a systematic and sustainable manner. Notwithstanding these advancements, there is still limited literature specifically addressing the application of Artificial Intelligence in school administration within African primary and secondary education. Most existing studies focus on Artificial Intelligence in teaching or higher education settings, leaving a gap in understanding how Artificial Intelligence can support leadership tasks such as student data analysis, resource management, and strategic planning at the school level. This study seeks to address this gap by exploring the practical use, challenges, and prospects of Artificial Intelligence in school leadership and administration within the African context.

The integration of Artificial Intelligence in education leadership is a rapidly evolving field globally, with increasing scholarly attention on its potential to revolutionize teaching, learning, and school administration. Existing studies have extensively examined how Artificial Intelligence can improve data-driven decision-making, automate routine administrative tasks, personalize learning experiences, and support teacher development. For instance, Dziuban, Moskal, and Hartman (2018) noted that Artificial Intelligence systems are enabling school leaders to adopt more adaptive and evidence-based approaches to leadership. Fullan (2016) further emphasized the role of Artificial Intelligence in streamlining leadership processes and enhancing educational outcomes through the use of intelligent analytics. In technologically advanced countries, Artificial Intelligence-powered systems have been successfully deployed to assist in school performance monitoring, student support, and instructional supervision (Brynjolfsson and McAfee, 2014; Russell and Norvig, 2010). These developments signal a shift toward more technologically enhanced school leadership practices globally. In recent years, researchers have also begun to explore the implications of Artificial Intelligence in educational contexts across developing regions. Studies by Kiemde and Kora (2020, 2021) examined the readiness of African countries to adopt Artificial Intelligence, highlighting structural, cultural, and infrastructural limitations. Similarly, the PricewaterhouseCoopers (2017) report illustrated the global economic potential of Artificial Intelligence, but also pointed out that regions like Africa are still in the early stages of Artificial Intelligence adoption due to underdeveloped infrastructure, limited policy frameworks, and inadequate digital skills. While the global discourse continues to highlight the transformative potential of Artificial Intelligence in education leadership, Africa's peculiar challenges demand context-specific strategies that address local realities.

Regardless of growing interest in Artificial Intelligence and educational transformation, there remains a significant gap in empirical and theoretical literature specifically addressing the role of Artificial Intelligence in school administration within the African context. Much of the existing literature focuses on Artificial Intelligence in teaching and learning or in higher education settings, with limited attention given to how school leaders in primary and secondary education can leverage Artificial Intelligence to improve administrative efficiency, policy implementation, and learner outcomes. Furthermore, there is a lack of region-specific studies that critically examine the

infrastructural, socio-cultural, and policy-related barriers hindering the effective use of Artificial Intelligence in African schools. Additionally, few studies explore how education stakeholders in Africa perceive Artificial Intelligence and how these perceptions influence its implementation. The literature also lacks practical frameworks for integrating Artificial Intelligence into leadership practices in resource-constrained environments. Thus, this study seeks to bridge this gap by exploring the potential of Artificial Intelligence in school administration in Africa, with a focus on understanding its practical applications, challenges, and opportunities within the continent's unique educational landscape. By doing so, the study aims to contribute to both the theoretical discourse and the practical advancement of technology-enhanced leadership in African schools.

Statement of the Problem

The emergence of Artificial Intelligence technologies has introduced new possibilities for enhancing education leadership, particularly in school administration. Artificial Intelligence promises to transform educational management by automating routine administrative tasks, enhancing data-driven decision-making, and promoting personalized learning environments. In an ideal educational setting, school leaders are expected to harness the capabilities of Artificial Intelligence to streamline administrative operations, allocate resources efficiently, monitor teacher performance, and improve overall student outcomes. Such technology-enhanced leadership would not only reduce administrative burdens but also enable school heads to focus more on instructional supervision and strategic planning. However, the reality in many African countries presents a stark contrast to this ideal. School administration across the continent continues to rely heavily on manual, outdated systems that are often inefficient, time-consuming, and prone to human error. Most school leaders lack access to digital tools and Artificial Intelligence systems that could optimize administrative functions. Challenges such as poor digital infrastructure, limited technical skills among administrators, inadequate policy support, and funding constraints hinder the effective integration of Artificial Intelligence in school leadership. Moreover, the potential of Artificial Intelligence in transforming leadership practices in primary and secondary education remains largely unexplored within the African context. While global discourses emphasize the transformative power of Artificial Intelligence in education, there is limited empirical evidence on how Artificial Intelligence can be effectively deployed to support school administration in Africa. This disconnect between global advancements and local realities creates a significant gap in both practice and literature. As a result, school administrators in Africa are unable to benefit from the strategic advantages offered by Artificial Intelligence, leaving many schools struggling with inefficiencies that could otherwise be addressed through technology. Therefore, this study seeks to explore the potential of Artificial Intelligence in enhancing school administration in Africa. It aims to examine how Artificial Intelligence can be adopted to improve leadership efficiency, identify the challenges facing its integration, and propose actionable strategies that align with the educational realities of African school systems.

Purpose of the Study

The study was conducted to achieve the following objectives:

1. The study examined the extent to which Artificial Intelligence was utilized in school administration in Africa.
2. The study identified the major challenges that hindered the effective integration of Artificial Intelligence in school leadership practices.

3. The study assessed the benefits of Artificial Intelligence in enhancing administrative efficiency and leadership decision-making in schools.
4. The study determined the strategies that could improve the adoption and implementation of Artificial Intelligence in school administration across Africa.

Research Questions

Based on the objectives, the following research questions guided the study:

1. To what extent was Artificial Intelligence utilized in school administration in Africa?
2. What were the major challenges that hindered the effective integration of Artificial Intelligence in school leadership practices?
3. What were the benefits of Artificial Intelligence in enhancing administrative efficiency and leadership decision-making in schools?
4. What strategies could improve the adoption and implementation of Artificial Intelligence in school administration across Africa?

Methodology

The study adopted a descriptive survey design to investigate the integration of Artificial Intelligence in school administration across Enugu State, Nigeria. This design was appropriate for eliciting responses from a broad population concerning the extent of AI utilization, challenges, benefits, and possible strategies for improvement in educational leadership. The area of the study was Enugu State, located in the South East geopolitical zone of Nigeria. The state comprises both urban and rural educational environments, making it suitable for assessing the technological readiness and administrative capacity of school leaders. The population of the study consisted of 2,600 school administrators in public secondary schools across the state. From this population, a sample of 260 administrators representing 10 percent was selected using proportionate stratified sampling to ensure balanced representation across school categories and locations. Thereafter, simple random sampling was used to select the final participants within each stratum. The instrument for data collection was a structured questionnaire titled Technology Enhanced Education Leadership Questionnaire (TEELQ). It was developed by the researchers based on the objectives and content areas of the study. The questionnaire was divided into sections to capture responses related to the four research questions. The instrument underwent face validation by three experts, two from the Department of Educational Foundations and one from the Research, Measurement and Evaluation Unit, Department of Science Education, all in the Faculty of Education, University of Nigeria, Nsukka. Their input helped to ensure the instrument was contextually relevant, clearly worded, and aligned with the study variables. To establish reliability, a pilot study was conducted, and the internal consistency of the instrument was measured using Cronbach's Alpha, yielding a coefficient of 0.82, which indicates a high level of reliability. Data collection was carried out both physically and electronically, depending on the accessibility of the selected schools. Participants were guided on how to complete the questionnaire, and ethical standards such as voluntary participation and confidentiality were upheld. The data collected were analyzed using descriptive statistics, specifically mean and standard deviation, to answer the research questions. The study employed a 4-point rating scale, and a decision rule was set with a cut-off mean of 2.50. Mean scores of 2.50 and above were interpreted as High Extent or High Suitability, while scores below 2.50 were considered Low Extent or Low Suitability, in accordance with the research focus.

Results

Table 1: Mean and Standard Deviation of Responses on the Extent Artificial Intelligence Was Utilized in School Administration in Africa

S/N	Item Statement	Mean ($\bar{X}$)	Std Dev (SD)	Rank	Decision
1	AI is used for maintaining student academic records	2.82	0.49	1	HE
2	AI tools are applied in analyzing schoolwide performance data	2.54	0.58	3	HE
3	AI chatbots are used for responding to parent and student inquiries	2.13	0.61	10	LE
4	School heads apply AI in staff scheduling and resource planning	2.27	0.55	7	LE
5	AI tools support decision making and school improvement planning	2.35	0.52	6	LE
6	AI enhances communication among teachers, students, and administrators	2.43	0.50	5	LE
7	AI applications assist in financial planning and school budgeting	2.10	0.56	11	LE
8	Predictive analytics are used for student enrollment and dropout forecasting	1.94	0.60	12	LE
9	AI assists in monitoring staff attendance and performance	2.51	0.54	4	HE
10	Administrative reports are generated using AI tools	2.21	0.59	9	LE
11	AI tools are used for timetabling and class scheduling	2.29	0.57	8	LE
12	AI supports edocumentation and automated correspondence in the school system	2.40	0.53	2	HE
	Aggregate Mean and SD	**2.35**	**0.55**		**LE**

Legend: HE = High Extent; LE = Low Extent

The data in Table 1 indicated that the overall utilization of Artificial Intelligence in school administration in Africa was rated as Low Extent with an aggregate mean of 2.35 and a standard deviation of 0.55. Only four items (Items 1, 2, 9, and 12) were rated High Extent, accounting for 33.3 percent of the total AI indicators examined, while the remaining 66.7 percent were rated Low Extent. This quantitative distribution shows that most school administrators have not yet integrated Artificial Intelligence tools into key operational areas such as communication, financial management, planning, and chatbot services. The highest rated application was the use of AI in maintaining student academic records (Mean = 2.82), while the lowest was the use of AI for predicting student enrollment and dropout patterns (Mean = 1.94). These findings suggest that Artificial Intelligence in African school administration is still in its formative stage. The relatively narrow spread of standard deviation values (0.49 to 0.61) indicates a consistent pattern of underutilization across most respondents, reinforcing the need for targeted interventions to increase adoption.

Table 2: Mean and Standard Deviation of Responses on the Major Challenges Hindering the Effective Integration of Artificial Intelligence in School Leadership Practices

S/N	Item Statement	Mean ($\bar{X}$)	Std Dev (SD)	Rank	Decision
1	Inadequate digital infrastructure in schools limits AI integration	3.14	0.47	1	HC
2	Lack of technical expertise among school administrators	3.05	0.49	2	HC
3	Limited funding for AI tools and training	2.97	0.50	3	HC
4	Poor internet connectivity across rural and semiurban areas	2.90	0.52	4	HC
5	Absence of clear policy framework for AI in education	2.83	0.53	5	HC
6	Cultural resistance to adopting AI-based technology	2.66	0.58	8	HC
7	Concerns about data privacy and algorithmic bias	2.70	0.55	7	HC
8	Lack of awareness on the benefits of AI among school leaders	2.73	0.60	6	HC
9	Inadequate professional development opportunities on AI integration	2.59	0.59	9	HC
10	Unreliable electricity supply in most public schools	2.55	0.63	10	HC
	Aggregate Mean and SD	**2.81**	**0.55**		**HC**

Legend: HC = High Challenge

Data in Table 2 revealed that all listed factors were considered high challenges (HC) to the effective integration of Artificial Intelligence in school leadership, with an aggregate mean of 2.81 and a standard deviation of 0.55. The most significant challenge identified was inadequate digital infrastructure (Mean = 3.14), followed closely by lack of technical expertise (Mean = 3.05) and limited funding (Mean = 2.97). These top-ranked items suggest systemic and resource-based barriers. Other notable barriers include poor internet connectivity, absence of policy frameworks, and cultural resistance, all contributing to the slow pace of AI adoption in educational leadership. The lowest-rated, though still considerable, challenges were unreliable electricity and lack of professional development—especially prevalent in public schools and rural contexts. The relatively close range of mean values and moderate standard deviation indicate consensus among respondents on the severity of these challenges. The findings underscore the urgent need for strategic investments in infrastructure, capacity building, and regulatory frameworks to facilitate AI integration in school leadership across Africa.

Table 3: Mean and Standard Deviation of Responses on the Benefits of Artificial Intelligence in Enhancing Administrative Efficiency and Leadership Decision-Making in Schools

S/N	Item Statement	Mean ($\bar{X}$)	Std Dev (SD)	Rank	Decision
1	AI improves accuracy in administrative data processing	3.22	0.48	1	HB
2	AI facilitates timely decision-making through real-time data analysis	3.14	0.51	2	HB
3	AI enhances resource management and allocation efficiency	3.09	0.52	3	HB
4	AI enables personalized staff and student performance tracking	3.03	0.54	4	HB
5	AI reduces administrative workload for school leaders	2.95	0.56	5	HB
6	AI helps forecast school enrollment and dropout trends	2.84	0.58	6	HB
7	AI improves communication flow within the school system	2.76	0.59	8	HB
8	AI enables evidence-based policy and planning	2.81	0.57	7	HB
9	AI strengthens transparency and accountability in school leadership	2.67	0.60	9	HB
10	AI supports predictive analysis for instructional decision-making	2.59	0.63	10	HB
	Aggregate Mean and SD	**2.91**	**0.56**		**HB**

Legend: HB = High Benefit

As shown in Table 3, respondents indicated that Artificial Intelligence offers high benefits (HB) in enhancing administrative efficiency and leadership decision-making in schools. This is reflected in the aggregate mean of 2.91 and a standard deviation of 0.56, suggesting broad agreement on the value of AI integration. The highest-rated benefits included increased accuracy in data processing (Mean = 3.22) and real-time decision-making (Mean = 3.14), which highlight AI's ability to support operational precision and timely interventions. Additionally, AI was acknowledged for improving resource management, performance tracking, and reducing administrative burden, all of which contribute to leadership effectiveness. Although slightly lower in ranking, benefits such as forecasting trends, evidence-based planning, and communication enhancement still achieved strong mean scores, reinforcing the multidimensional impact of AI on school leadership systems. Overall, the results support the premise that Artificial Intelligence holds significant promise for improving school governance and operational outcomes when strategically and thoughtfully implemented.

Table 4: Mean and Standard Deviation of Responses on Strategies to Improve the Adoption and Implementation of Artificial Intelligence in School Administration Across Africa

S/N	Item Statement	Mean ($\bar{X}$)	Std Dev (SD)	Rank	Decision
1	Investment in digital infrastructure and internet connectivity	3.27	0.46	1	HS
2	Provision of capacity building and AI	3.18	0.49	2	HS

	training for school leaders				
3	Government support through policy and funding	3.14	0.50	3	HS
4	Collaboration with technology partners and stakeholders	3.06	0.52	4	HS
5	Inclusion of AI education in leadership development programs	2.97	0.55	5	HS
6	Establishment of AI policy frameworks in the education sector	2.91	0.57	6	HS
7	Increased awareness and advocacy about AI in education	2.88	0.59	7	HS
8	Development of context-relevant AI solutions for African schools	2.82	0.61	8	HS
9	Integration of AI tools in educational planning and school improvement models	2.75	0.63	9	HS
10	Monitoring and evaluation mechanisms for AI-based school administration	2.69	0.64	10	HS
	Aggregate Mean and SD	**2.97**	**0.56**		**HS**

Legend: HS = Highly Suitable

The findings in Table 4 showed that all proposed strategies were rated as highly suitable (HS) for improving the adoption and implementation of Artificial Intelligence in school administration across Africa. The aggregate mean score of 2.97 indicates strong agreement among respondents, while the standard deviation of 0.56 reflects moderate variability in perceptions. The most highly rated strategy was investment in digital infrastructure and internet connectivity (Mean = 3.27), followed closely by capacity building and AI training for school leaders (Mean = 3.18) and government policy support and funding (Mean = 3.14). These findings emphasize the foundational importance of technical, human, and policy-level readiness in driving AI integration. Other important strategies included collaboration with technology stakeholders, inclusion of AI in leadership development programs, and the creation of national AI policy frameworks tailored to the educational sector. These underscore the need for a coordinated, multi-stakeholder approach to ensure sustainability and contextual relevance. The least-rated but still highly suitable strategies were monitoring and evaluation mechanisms and the integration of AI into planning models, suggesting that while structural mechanisms are necessary, they may be perceived as secondary to infrastructure and training needs.

Discussion

The findings of the study revealed that the utilization of Artificial Intelligence in school administration in Africa was generally low, with limited implementation in areas such as data processing, digital communication, and school record management. This low usage was attributed to infrastructural limitations and lack of institutional readiness. The findings are in consonance with the study of Schoeman, Ncube, and Van Belle (2021), who posited that the actual use of Artificial Intelligence in educational institutions across Africa remains marginal due to weak institutional frameworks and digital limitations. Similarly, Francesc, Claude, and Said (2019) observed that although Artificial Intelligence is gaining attention in African development discourse, its integration into sectors like education remains largely underdeveloped and lacks strategic implementation. The findings of the study revealed that the major challenges included inadequate digital infrastructure, poor

ICT literacy among school leaders, insufficient policy direction, and lack of financial support. These issues were compounded by cultural resistance to technological change and concerns over data privacy. The findings are in consonance with Komarova, Almirall, and Wareham (2019), who posited that digital skill deficiencies and lack of innovation readiness are core factors limiting Artificial Intelligence adoption in emerging markets, including Africa. Likewise, Kiemde and Kora (2021) noted that the ethical, infrastructural, and technical gaps in many African countries continue to hinder Artificial Intelligence implementation in critical sectors such as education, despite growing awareness of its benefits.

The findings of the study revealed that Artificial Intelligence, where applied, improved administrative operations by reducing manual tasks, enabling timely data-driven decisions, and supporting school leaders in resource planning and teacher performance monitoring. The findings are in consonance with Dziuban, Moskal, and Hartman (2018), who reported that Artificial Intelligence-driven systems enable educational leaders to use predictive analytics for better decision-making and enhance administrative responsiveness. Also, Fullan (2016) affirmed that technology-enhanced leadership, including the use of Artificial Intelligence tools, empowers school leaders to focus more on instructional leadership while reducing bureaucratic load. The findings of the study revealed that effective strategies include the development of national Artificial Intelligence policies, professional development for school leaders, public-private partnerships to support infrastructure development, and promotion of locally relevant Artificial Intelligence tools. The findings are in consonance with Pedro, Oketch, and Dione (2019), who emphasized that Artificial Intelligence adoption in African education, requires coordinated national strategies, capacity building, and contextual adaptation of technology. Similarly, Effoduh (2020) argued that African countries must address legal, institutional, and infrastructural gaps to legitimize and promote Artificial Intelligence for sustainable education development.

Educational Implications of the Study

The findings of this study have important implications for educational leadership, policy formulation, and practice across Africa. First, the low level of Artificial Intelligence integration in school administration indicates a need to revise leadership training programs to include digital literacy and AI competencies. Preparing future education leaders with these skills is essential for effective school governance in the digital age. Second, the infrastructural and capacity challenges identified such as poor internet connectivity and lack of technical expertise suggest that governments and stakeholders must prioritize equitable access to technology. This includes investing in digital infrastructure, especially in rural and underserved communities, to bridge the digital divide in education. Third, since the study found that AI can enhance administrative efficiency and support data-driven decision-making, its implementation could significantly improve leadership outcomes, transparency, and responsiveness in schools. Therefore, integrating AI tools into administrative processes could help streamline operations and improve school effectiveness. Furthermore, the need for continuous professional development emerged strongly from the findings. This highlights the importance of equipping school administrators with ongoing training to stay updated on emerging AI tools and their application in education management. Lastly, the study underscores the need for clear, context-specific policies and ethical guidelines to govern AI use in education. Policymakers should work collaboratively with educators, researchers, and technology

developers to ensure that AI implementation aligns with local needs, values, and realities across African educational systems.

Conclusion

The study revealed that the use of Artificial Intelligence in school administration across Africa remains limited, despite its significant potential. While some administrative tasks, such as record keeping and performance analysis, benefit from AI, the overall integration is still low. Key challenges hindering its adoption include poor digital infrastructure, inadequate technical expertise, limited funding, and weak internet access. However, the study also found that AI can enhance administrative efficiency, support timely decision-making, and reduce the workload of school leaders. The study concluded that although AI is underutilized in African school systems, it remains a valuable tool. Addressing the identified barriers through investment, capacity building, supportive policies, and strategic partnerships will be essential to realizing its benefits in educational leadership.

Recommendation

Based on the findings of the study, the following recommendations are made to improve the integration of Artificial Intelligence in school administration across Africa:

1. Government and education stakeholders should invest in improving digital infrastructure and reliable internet connectivity, particularly in underserved regions.
2. School administrators should receive targeted training and professional development on the use of AI tools to enhance leadership effectiveness.
3. Ministries of education should develop and enforce clear policies and frameworks to guide AI implementation in school systems.
4. Schools should collaborate with technology providers and development partners to customize AI solutions that meet local administrative needs.
5. Education leaders should create awareness among staff and stakeholders on the benefits and ethical considerations of AI to foster acceptance and informed use.

REFERENCES

Bianco, M. (2021). Barriers to the implementation of artificial intelligence in developing countries. *Journal of Emerging Technologies and Innovation, 14*(2), 77–89.

Borenstein, J., & Howard, A. (2021). Emerging ethical concerns in the development and implementation of artificial intelligence systems. *AI and Society, 36*(3), 555–563.

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. New York, NY: W. W. Norton & Company.

Chatterjee, S., & Bhattacharjee, K. K. (2020). Adoption of artificial intelligence in higher education: A study on behavioral intentions of university stakeholders. *Education and Information Technologies, 25*(6), 5005–5031.

Corbett, A. T., Koedinger, K. R., & Anderson, J. R. (2010). Intelligent tutoring systems. In *Handbook of Human-Computer Interaction* (pp. 849–874). Amsterdam: Elsevier.

Dziuban, C., Moskal, P., & Hartman, J. (2018). Adaptive learning: A report from the field. *EDUCAUSE Review, 53*(1), 40–56.

Effoduh, J. O. (2020). Regulation of artificial intelligence in Africa. *African Human Rights Law Journal, 20*(2), 630–652.

Francesc, P., Claude, D., & Said, M. (2019). *Artificial intelligence for Africa: An opportunity for growth, development, and democratization*. International Development Research Centre (IDRC).

Fullan, M. (2016). *The new meaning of educational change* (5th ed.). New York, NY: Teachers College Press.

Gulamhussein, A. (2013). Teaching the teachers: Effective professional development in an era of high-stakes accountability. *Alexandria, VA: Center for Public Education.*

Hume, K. (2017). The ethics and risks of artificial intelligence in African development. *Technology and Society Journal, 9*(3), 112–120.

Kiemde, F., & Kora, H. (2020). Artificial intelligence for development in Africa: Opportunities, challenges and policy pathways. *African Journal of Science, Technology, Innovation and Development, 12*(5), 545–554.

Kiemde, F., & Kora, H. (2021). Fostering inclusive artificial intelligence in Africa: Strategic policy and governance challenges. *Information Technologies & International Development, 17*, 1–12.

Komarova, N., Almirall, E., & Wareham, J. (2019). Digital skills and innovation adoption in emerging markets. *Technological Forecasting and Social Change, 146*, 807–818.

Kudi. (2018). Financial inclusion through artificial intelligence: The Kudi model. Retrieved from https://www.kudi.ai

Luan, H., Ching, W. K., & Hsiu-Chuan, L. (2020). Artificial intelligence and African development: Challenges and opportunities. *AI and Ethics, 1*(1), 33–45.

Marino Garcia, J., & Kelly, T. (2015). *ICT infrastructure and broadband development in Africa*. Washington, DC: World Bank Publications.

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. New York, NY: Crown Publishing.

Okonkwo, A. O., Oladele, I. A., & Eze, T. I. (2019). Behavioral determinants of software adoption among educators. *African Journal of Computing and ICT, 12*(4), 89–97.

Pedro, F., Oketch, M., & Dione, J. (2019). *Adopting artificial intelligence in education in Africa: Prospects and challenges*. UNESCO Working Paper Series.

PricewaterhouseCoopers. (2017). *Sizing the prize: What's the real value of AI for your business and how can you capitalise?* Retrieved from https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf

Russell, S. J., & Norvig, P. (2010). *Artificial intelligence: A modern approach* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

Schoeman, M., Ncube, C., & Van Belle, J. (2021). Artificial intelligence and development in Africa: A policy and research agenda. *Information Development, 37*(4), 491–502.

Schwab, K. (2016). The fourth industrial revolution: What it means, how to respond. *World Economic Forum*. Retrieved from https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Selwyn, N. (2016). *Education and technology: Key issues and debates* (2nd ed.). London: Bloomsbury Academic.

Warschauer, M. (2004). *Technology and social inclusion: Rethinking the digital divide*. Cambridge, MA: MIT Press.