

TRANSFORMATIVE EDUCATIONAL LEADERSHIP AS A PREDICTOR OF ARTIFICIAL INTELLIGENCE READINESS IN PUBLIC SENIOR SECONDARY SCHOOLS IN LAGOS STATE, NIGERIA

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Abstract

As artificial intelligence (AI) becomes increasingly fundamental to education systems globally, public senior secondary schools in Lagos State, Nigeria face the urgent need to assess their readiness for AI integration. This study examined the relationship between transformative educational leadership and AI readiness in selected public senior secondary schools in Lagos State. Specifically, the study investigated the relationships between administrative efficiency, resource management, and digital literacy, and institutional AI readiness indicators such as digital skills, staff capacity, and organisational preparedness. A quantitative research design was adopted, and data were collected from 50 principals in Education District V, Lagos State, using a structured questionnaire. Data were analysed using descriptive statistics and Pearson correlation analysis. Findings revealed significant positive relationships between leadership variables and AI readiness. Administrative efficiency showed the strongest correlation with AI readiness ($r = .62, p < .01$), followed by resource management ($r = .54, p < .01$). Digital literacy also showed a significant but comparatively weaker relationship with AI readiness ($r = .54, p < .01$), indicating its continued importance as a developmental challenge in schools. The study concludes that transformative educational leadership is a significant predictor of AI readiness in public senior secondary schools in Lagos State, Nigeria. It recommends targeted leadership training, improved policy frameworks, and increased investment in digital infrastructure to support effective and equitable AI adoption in schools.

Keywords: Administrative efficiency, artificial intelligence readiness, digital literacy, resource management, transformative educational leadership

Introduction

The 21st century is defined by an unprecedented pace of digital transformation, with artificial intelligence (AI) operating at the forefront of this global revolution. AI is no longer a futuristic concept, but an active driver that is reshaping

economies, industries, and societies worldwide (UNESCO, 2021). Its profound influence extends into education, where AI-powered technologies are transforming teaching methodologies, learning experiences, and administrative processes. Across the world, leading educational

institutions are harnessing AI for personalised learning, intelligent tutoring systems, automated administration, and data-driven decision-making (Luckin et al., 2016). This technological shift demands that education systems urgently evolve to remain relevant and equitable or risk deepening existing inequalities.

In the Nigerian education sector, national policies reflect a strong commitment to integrating technology into education to fuel socio-economic development and to position Nigerian citizens as innovators in the global digital ecosystem. The National Policy on Education (FRN, 2013) particularly emphasises the need for ICT integration across all education levels to develop a knowledge-based economy. Similarly, the National Digital Economy Policy and Strategy (2020–2030), alongside the National Artificial Intelligence Strategy, demonstrate the federal government's vision for developing a digitally skilled and AI-ready population poised to lead Africa's future technology (NITDA, 2020).

Despite this, an obvious gap exists between policy intentions and the everyday realities within public secondary schools, particularly in Lagos State which is perceived to be Nigeria's economic powerhouse and technology hub. Lagos has undertaken laudable initiatives such as the Eko Excel Programme aimed at digitising basic education through infrastructure and foundational digital literacy development (Lagos State Ministry of Education, 2020). However, preparing schools for the complex demands of AI adoption remains largely unaddressed. Most public senior secondary schools contend with infrastructural challenges, including irregular electricity supply, limited broadband internet access, insufficient computing devices, and a teaching workforce still catching up with basic digital competencies (Adeoye, Tiku, & Adedayo, 2022). This situation, if not

urgently and appropriately addressed, could transform AI from an opportunity into an avenue of educational exclusion, further widening the gap between Nigeria's youth and their global counterparts, and between well-resourced private schools and underfunded or poorly equipped public institutions.

Within this context, there is an important role that educational leadership plays. The mere presence of technology is insufficient for change; successful AI integration is first and foremost a human and organisational challenge (Fullan, 2007). School principals, as frontline educational leaders, are important agents of change whose leadership approaches can either promote innovation or deepen stagnation in technology adoption. Traditional leadership models that emphasise hierarchy and compliance fail to meet the demands of this complex transformation. Instead, what is required is transformative educational leadership—a style characterised by vision, inspiration, intellectual stimulation, personalised support, and ethical stewardship (Bass & Riggio, 2006; Leithwood, 2021).

A transformative principal does more than manage administrative tasks; they cultivate a shared vision, build teacher capacity, advocate for resources, formulate responsive policies, and foster a digital school culture. More importantly, in the AI era, they also guide the ethical deployment of technology, ensuring fairness, privacy, and equity in educational applications. In Nigerian public schools, where resources are limited and infrastructure is inadequate, such leadership is not just beneficial but essential to bridging the divide between policies and reality.

While research on ICT integration in Nigerian schools is extensive (Adedoyin, 2020; Ololube, 2015), there is a notable absence of empirical studies focusing explicitly on AI readiness and the transformative leadership practices necessary to realise it. This study

addresses that gap by investigating how transformative educational leadership impacts AI readiness in public senior secondary schools in Lagos State.

Statement of the Problem

Nigeria is currently experiencing a period in which the integration of Artificial Intelligence (AI) in education presents significant opportunities for transforming teaching and learning. However, these opportunities are constrained by a persistent digital divide, particularly in public secondary schools in Lagos State. A key challenge is the limited empirical understanding of how school principals' leadership practices influence AI readiness in public secondary schools. While private schools are increasingly adopting AI-driven tools and smart learning environments, many public schools continue to rely on traditional instructional approaches with limited access to digital infrastructure and resources.

In addition, there exists a significant policy-to-practice gap in the implementation of educational technology policies. Although national policies emphasise ICT and digital transformation in education, their implementation remains inconsistent due to inadequate funding, weak implementation structures, and limited institutional support (Bello, 2024). Resistance to technological change among some educators and administrators further complicates AI integration efforts (Adebayo, 2023). Effective school leadership is therefore critical in bridging this gap and translating policy into practice. However, empirical studies examining the influence of transformative leadership on AI readiness in Nigerian public senior secondary schools remain limited. This study addresses this gap by investigating the relationship between transformative educational leadership and AI

readiness in Lagos State public senior secondary schools.

Transformative Educational Leadership

Transformative educational leadership is a leadership approach that inspires and empowers school communities to achieve meaningful institutional change beyond routine administrative functions (Bass & Riggio, 2006). Unlike traditional leadership models, it emphasises shared vision, intellectual stimulation, individualised support, and ethical practice to advance organisational goals (Bass & Riggio, 2006; Leithwood, 2021). In the context of technological innovation, transformative leaders act as catalysts that encourage staff to embrace innovation, build capacity, and respond effectively to educational change (Fullan, 2007). Such leadership fosters a culture of resilience, collaboration, and continuous improvement, which is essential for AI integration in education systems.

AI Readiness

Artificial Intelligence (AI) is increasingly shaping global education systems by enhancing teaching, learning, and administrative processes (UNESCO, 2021). AI applications such as intelligent tutoring systems and learning analytics support personalised instruction, early identification of at-risk learners, and data-informed decision-making. In addition, AI reduces administrative workload by automating routine tasks, thereby allowing teachers to focus more on pedagogical and learner-centred activities (Adebayo, 2023).

In Nigeria, AI offers significant potential to address systemic educational challenges such as overcrowded classrooms and teacher shortages. However, its adoption is constrained by infrastructural limitations, including unstable electricity supply, inadequate internet access, and

high costs of digital infrastructure (Bakare, 2024; Bali, Ofori, & Chen, 2024). Furthermore, low digital literacy among educators and administrators remains a critical barrier to effective AI implementation (Adebayo, 2023).

Transformative Educational Leadership and AI Readiness

Educational leadership is a critical determinant of successful technology integration in schools (Fullan et al., 2024). In the context of AI adoption, school principals are expected to provide instructional leadership that integrates both pedagogical and technological dimensions of change. Effective leaders prioritise digital literacy development, curriculum integration of digital competencies, and institutional readiness for innovation (Onyebuchim, 2025).

Empirical evidence suggests that successful AI implementation depends on continuous professional development for both leaders and teachers (Ghamrawi, Ibrahim, & Ahmad, 2024). Transformative leaders allocate resources for training programmes that enhance teachers' ability to integrate AI into instructional practices (Bello, 2024). In addition, they support data-driven decision-making by building staff capacity to interpret and utilise educational data effectively. This highlights the role of leadership as a critical bridge between policy intentions and practical implementation in education systems (NITDA, 2020).

Purpose of the Study

This study investigates the relationship between transformative educational leadership practices and artificial intelligence (AI) readiness in Lagos State public senior secondary schools. Specifically, it determines the relationship between administrative efficiency, resource management, and digital literacy, and AI

readiness in Lagos State public senior secondary schools.

Research Hypotheses

1. There is no significant relationship between administrative efficiency and AI readiness in Lagos State public senior secondary schools.
2. There is no significant relationship between resource management and AI readiness in Lagos State public senior secondary schools.
3. There is no significant relationship between digital literacy and AI readiness in Lagos State public senior secondary schools.

Methodology

This study employed a descriptive correlational survey design to examine the relationship between transformative educational leadership practices and artificial intelligence (AI) readiness in public senior secondary schools in Lagos State, Nigeria. The population of the study comprised principals in public senior secondary schools in Education District V, Lagos State. A sample of 50 principals was selected through purposive sampling. Data were collected using a validated, researcher-developed instrument titled Transformative Educational Leadership for AI Readiness Questionnaire (TELARQ). The instrument was structured on a Likert scale and measured dimensions of leadership practices, including administrative efficiency, resource management, and digital literacy. The instrument yielded a Cronbach's alpha reliability coefficient of .80, indicating acceptable internal consistency. Ethical approval was obtained prior to data collection. Informed consent was secured from all participants, and confidentiality of responses was strictly maintained.

Data were analysed using descriptive and inferential statistics. Specifically, Pearson Product-Moment Correlation analysis was conducted using SPSS version 28 to determine

the relationship between variables at a significance level of $p < .05$.

Results

Table 1: Administrative Efficiency and AI Readiness

Variable	N	M	SD	r	df	p
Administrative Efficiency	50	11.79	1.09	.62	48	< .01
AI Readiness	50	14.12	1.98			

Note. $p < .01$.

Table 2: Resource Management and AI Readiness

Variable	N	M	SD	r	df	p
Resource Management	50	11.98	1.07	.54	48	< .01
AI Readiness	50	14.12	1.98			

Note. $p < .01$.

Table 3: Digital Literacy and AI Readiness

Variable	N	M	SD	r	df	p
Digital Literacy	50	10.85	1.24	.54	48	< .01
AI Readiness	50	14.12	1.98			

Note. $p < .01$.

Hypothesis One Interpretation

The Pearson Product-Moment Correlation analysis revealed a significant positive relationship between administrative efficiency and AI readiness, $r(48) = .62$, $p < .01$. Therefore, the null hypothesis was rejected.

Hypothesis Two Interpretation

There was a significant positive relationship between resource management and AI readiness, $r(48) = .54$, $p < .01$. The null hypothesis was rejected.

Hypothesis Three Interpretation

The analysis revealed a significant positive relationship between digital literacy and AI readiness, $r(48) = .54$, $p < .01$, leading to the rejection of the null hypothesis.

Discussion of Findings

This study investigated the relationship between transformative educational leadership and AI readiness in Lagos State public senior secondary schools. The findings indicate that leadership practices of school principals are significant predictors of AI readiness.

The first hypothesis revealed a significant positive relationship between administrative efficiency and AI readiness, $r = .62$, $p < .01$. This suggests that principals who demonstrate effective planning, communication, and decision-making tend to create more supportive environments for AI adoption. This finding aligns with Fullan (2007), who emphasises that successful technology integration is largely a human and organisational process. Efficient administration appears to reduce institutional barriers and support the coordination of innovation-related activities.

Similarly, the second hypothesis showed a significant positive relationship between resource management and AI readiness, $r = .54$, $p < .01$. This indicates that principals who effectively allocate and mobilise resources are more likely to support AI readiness in schools. This finding is consistent with the infrastructural challenges identified in Nigerian education systems, including limited electricity supply and inadequate internet access (Bakare, 2024; Bali, Ofori, & Chen, 2024). It suggests that strategic resource management by school leaders can partially mitigate structural constraints to AI adoption.

The third hypothesis also revealed a significant positive relationship between digital literacy and AI readiness, $r = .54$, $p < .01$. This indicates that higher levels of digital literacy among school stakeholders are associated with greater readiness for AI integration. However, compared to the other variables, digital literacy may represent a more persistent developmental challenge within school systems. This supports Onyebuchim (2025), who emphasises the importance of leadership in promoting digital competence, as well as Ghamrawi, Ibrahim, and Ahmad (2024), who highlight the role of continuous professional development in

enhancing teachers' capacity for technology integration.

Overall, the findings suggest that while all examined leadership-related variables are significantly associated with AI readiness, their influence varies in strength and developmental complexity.

Conclusion

This study concludes that artificial intelligence (AI) readiness in Lagos State public senior secondary schools is significantly associated with the quality of educational leadership practices. Specifically, the findings indicate that administrative efficiency, resource management, and digital literacy are important factors linked to AI readiness in schools.

The study further suggests that school principals play a critical role in bridging the gap between national educational policy and practical implementation by fostering leadership practices that support technological integration and institutional preparedness for AI adoption.

Recommendations

1. The Lagos State Ministry of Education should implement compulsory professional development programmes for school principals focused on transformative leadership competencies. These programmes should emphasise strategic technology planning, resource allocation, and leadership for AI integration in schools.
2. Education District V should establish a structured public-private partnership (PPP) framework to enhance AI readiness in public senior secondary schools. This framework should facilitate collaboration with technology firms for the provision of

digital infrastructure, software resources, and technical support.

3. The Lagos State Government should establish a dedicated education technology grant scheme to support AI infrastructure development in public secondary schools. Access to the fund should be based on the submission and approval of school-level AI integration plans developed by principals.

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