

Artificial Intelligence and Digital Connectivity for the Management of Human Resources in Nigeria Education Sector

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Abstract

Original Research Article

The management of human resources in Nigerian education has historically faced challenges such as inefficiency, ghost worker syndromes, inequitable staff distribution, and weak professional development structures. With the rapid advancement of artificial intelligence (AI) and digital connectivity, there are emerging opportunities for transforming human resource management (HRM) processes in schools and higher institutions. This study examines the current practices of HRM in Nigerian education, highlights the role of AI and digital connectivity in reshaping HRM functions, and discusses challenges, prospects, and policy recommendations. Drawing on recent studies and global reports, the paper argues that AI-enabled HRM systems can improve transparency, efficiency, and accountability in education if infrastructural, policy, and capacity barriers are addressed.

Keywords: Artificial Intelligence, Digital Connectivity and Management of Human Resource.

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INTRODUCTION

Education is widely acknowledged as a tool for national development. Educational goals could only be achieved through adequate provision and effective management of human being (teaching and non-teaching staff). Every developing nation needs to build its human resources firmly since the future of any nation depends on the product of its educational system. (Osegbue et al 2018 & Enwereji et al 2022).

Human resource management (HRM) is at the core of any educational system, as the effectiveness of schools and universities largely depends on the quality, motivation, and efficiency of teachers, administrators, and support staff. The overall purpose of human resource management is to ensure that the organization is able to achieve success through people. Specifically, HRM is concerned with achieving objectives in areas such as organizational effectiveness, human capital management, knowledge management, reward management, employee relations, meeting diverse needs, bridging the gap between rhetoric and reality (Armstrong, 2006).

In Nigeria, HRM in education has historically been

characterized by manual-record-keeping, bureaucratic processes, and inefficiencies in recruitment, deployment, payroll, and performance appraisal (Okeke & Chinelo, 2021). These challenges often result in uneven teacher distribution, delays in staff remuneration, and poor accountability mechanisms, which negatively affect the quality of education delivered. With the rapid advancement of technology, artificial intelligence (AI) and digital connectivity are emerging as powerful tools for transforming HRM practices in education. It has gone a long way in managing students and staff academic activities, schools, finance and other administrative activities (Manafa, I.F & Ohamobi, I.N (2022). AI offers data-driven solutions for recruitment, performance evaluation, and professional development, while digital connectivity enables the integration of HR processes through online platforms, cloud-based systems, and biometric technologies (Akinwale & Adeniyi, 2023; UNESCO, 2023). Together, AI and digital connectivity hold the potential to revolutionize how educational institutions manage their workforce by ensuring transparency, efficiency, and accountability.

In the Nigerian context, the adoption of AI and digital technologies in HRM remains uneven. While some universities

and private schools have begun implementing digital recruitment portals, biometric attendance systems, and e-learning platforms, many public institutions still rely heavily on traditional, paper-based approaches (NITDA, 2023). This creates a digital divide that must be addressed if the education sector is to fully harness the benefits of emerging technologies. The outcome of this study would serve as a framework on the collaboration of AI with digital connectivity to enhance the management of human resource in education in Nigeria. Therefore, this study would be significant to the following:

School leaders, policy makers, teaching staff, educational institutions, students, and future researchers. School leaders can benefit from insights on AI and digital connectivity by enabling them to develop more effective HR strategies and practices. Policy makers can also benefit from recommendations on how to support the adoption and implementation of AI and digital technologies in HRM.

Teacher/lecturers would be availed with more efficient HR processes, improved communication and enhanced support. Schools, universities and colleges could gain from improved HRM since it would enhance decision making and increase efficiency. Technology provider could benefit from the outcome of this study by utilizing the opportunity to collaborate with educational institutions and supporting the adoption of AI and digital technologies to students, it would increase their access to digital resources and tools, supporting their learning and development and for the future researcher it would serve as a spring board for further research.

CONCEPTUAL CLARIFICATIONS AND THEORETICAL FRAMEWORK

Human Resource Management (HRM) in Education

Human resource management (HRM) plays a critical role in the effective functioning of any education system. Human resource management in education refers to the strategic processes involved in recruiting, developing, motivating, and retaining teachers and non-teaching staff to achieve educational goals. Unlike HRM in the corporate sector, HRM in education emphasizes professional growth, equitable staff distribution, and effective utilization of personnel to improve learning outcomes (Adelabu, Olaniyi, & Adeyemi, 2022). According to them HRM is central to ensuring that schools are staffed with qualified, motivated, and equitably distributed personnel. HRM in schools and universities involves functions such as workforce planning, recruitment, induction, professional development, performance appraisal, and welfare administration (Okeke & Chinelo 2021).

In Nigeria, however, HRM has been hampered by issues such as poor record-keeping, manual recruitment systems, over centralized decision-making, and delayed salaries and uneven staff deployment. The introduction of AI and digital connectivity offers promising avenues to reform the sector. AI has the potential to automate routine HR tasks, improve decision-making, and ensure transparency, while digital connectivity enhances communication, integration, and data-driven workforce management (Akinwale & Adeniyi, 2023).

Hence in this study Human Resource Management (HRM) in Education refers to the processes of recruitment, training, appraisal, and deployment of personnel within the education sector.

Artificial Intelligence (AI) in education

Artificial intelligence is broadly defined as the ability of machines and computer systems to perform tasks that would typically require human intelligence, such as problem-solving, decision-making, and pattern recognition (Russell & Norvig, 2021). The potential benefit of integrating AI in education is quite enormous. Ohamobi et al (2025) sees Artificial Intelligence (AI) in education as the computer programmes that are capable of carrying out operations like pattern recognition, problem solving, and decision-making.

In education, AI applications extend beyond teaching and learning to include administration and workforce management, such as automating recruitment processes, predicting teacher attrition, and providing personalized professional development pathways (UNESCO, 2023). AI-powered tools can automate routine HR tasks, provide data-driven insights and enhance decision-making. Akinwale and Adeniyi (2023) noted that AI tools are increasingly being used in Nigerian universities for digital record management, staff performance tracking and fraud detection in payroll systems. However in this context Artificial Intelligence (AI) in HRM entails the use of machine learning, predictive analytics and automation to support decision-making in performance appraisal, recruitment, and workforce planning and school administration.

Digital Connectivity

Digital Connectivity refers to the use of internet, cloud computing, and digital platforms to link HR databases and ensure real-time communication across education systems (NITDA, 2023). Digital connectivity refers to the integration of information and communication technologies (ICTs), internet infrastructure, and digital platforms that enable real-time access, sharing, and processing of information (International Telecommunication Union [ITU], 2022).

In human resource management, digital connectivity allows for cloud-based payroll systems, biometric verification, e-recruitment platforms, and online training modules, ensuring transparency, accessibility, and efficiency (NITDA, 2023). Within Nigerian education, digital connectivity has become crucial for linking institutions across different states, providing remote HR services, and reducing bureaucratic bottlenecks in staff management. Digital connectivity in this study refers to the ability to access and utilize digital technologies such as the internet, mobile devices and digital platform to connect with others, access information and conduct various activities in education sector.

Theoretical Perspective on AI and Digital Connectivity

Several theories could help in understanding AI and digital connectivity concept in HRM in education. This includes resource-based view by Barney 1991 which emphasizes that organizations gain a competitive advantage through valuable,

inimitable and non-substitutable resources meaning that by leveraging AI and digital platforms for effective HRM. Schools can optimize teachers' deployment, enhance performance monitoring and foster continuous capacity development, thus strengthening their institutional capacity (Adelabu et al, 2022). Another perspective for analyzing both diffusion of innovation theory by Rogers (2003) that explains how new technologies spread within social system. The use of Artificial Intelligence in HRM follows a similar trajectory; early adopters influence others, leading to broader institutional adoption. In Nigeria, diffusion is often slowed by infrastructural challenges such as poor internet penetration and resistance from staff unfamiliar with digital systems. Technology acceptance model (TAM) by Davis (1989) posits that the adoption of digital innovation depends on two main factors: perceived usefulness and perceived ease of use, narrowing it down to Nigeria education sector HR managers and school administrators are more likely to adopt AI-enabled HR systems when they believe such technologies will simplify recruitment of teachers , evaluation ,payroll etc.

Current Practices in Human Resource Management in Education

In Nigeria, HRM is still dominated by manual and paper-based systems. Recruitment processes are often politicized, resulting in inefficiency and inequity. Payroll management is plagued by ghost worker syndromes, while staff training is irregular and insufficient (Oni, 2023). Additionally, teacher deployment is uneven with urban schools often overstaffed and rural schools under-resourced (UNESCO, 2023).

The current HRM practices in Nigeria's education system reflect a mixture of traditional manual processes and emerging digital initiatives. Although progress has been made with systems like: Integrated payroll and Personnel Information System(IPPIS) and digital professional development platforms to address inefficiencies in recruitment, payroll, and performance management that continue to hinder effective human resource utilization in schools and universities.

This situation underscores the urgent need for artificial intelligence and digital connectivity to streamline HRM in education. Supporting the view of Oni (2023) that digital systems such as the Integrated Payroll and Personnel Information System (IPPIS) have been introduced to checkmate payroll irregularities, but challenges such as data integration, resistance to change, and system downtime persist. Human resource management in Nigeria's education sector has historically been rooted in manual and bureaucratic practices, with slow adoption of digital tools compared to other sectors. The current practices can be broadly categorized into recruitment and deployment, payroll management, performance appraisal, and professional development.

1. Recruitment and Deployment

Recruitment of teachers and administrative staff in Nigeria are largely centralized and bureaucratically managed either by state ministry of education, state universal basic

education boards (SUBEBs) or governing councils of tertiary institutions. In many cases, recruitment is paper-based, with applications/manually processed and physical interviews conducted (Okeke& Chinelo, 2021).

This practice often leads to inefficiencies, favoritism, and a mismatch between staff specialization and subject needs (Adebayo &; Ibrahim, 2022).

2. Payroll and Personnel Management

Payroll administration remains one of the most critical HRM functions in education. The federal government introduced the Integrated Payroll and Personnel Information System (IPPIS) to tackle issues of "ghost workers" and ensure transparency in salary payments (Ogunode, 2022).

However, implementation challenges such as network failures, delayed salary processing, and disputes over data accuracy persist, particularly in universities where staff/unions have criticized the system for not reflecting sector-specific needs (Oni, 2023).

3. Performance Appraisal

Performance appraisal in Nigerian schools is still largely subjective and irregular, often based on traditional inspection reports and supervisor evaluations. In tertiary institutions, annual performance reviews are conducted primarily for promotions and tenure decisions (Adelabu, Olaniyi, &; Adeyemi, 2022). However, the lack of robust digital systems to track real-time performance indicators such as attendance, workload, and student feedback limits the reliability of these assessments (Akinwale &; Adeniyi, 2023).

4. Professional Development

Training and retraining of educators remain a key HRM activity. Most teachers' professional development programs are organized as workshops and seminars, often funded by government agencies such as the Teachers Registration Council of Nigeria (TRCN) or Tertiary Education Trust Fund (TETFund). While some institutions now provide online training modules, access is inconsistent due to infrastructural and digital literacy challenges (UNESCO, 2023).

5. Record-Keeping and Documentation

Personnel records in many Nigerian schools are still kept in manual files and registers, making data retrieval time-consuming and prone to loss or manipulation (Ogunode, 2022). While some private institutions have adopted digital human resource information systems (HRIS), widespread adoption in public schools is limited by poor ICT infrastructure and inadequate funding.

CHALLENGES OF AI AND DIGITAL CONNECTIVITY IN HRM IN NIGERIA

The adoption of AI and digital connectivity in HRM faces multiple challenges:

1. Inadequate Infrastructure: Limited broadband access and poor electricity supply restrict digital HRM

implementation (NCC, 2023). Without reliable internet connectivity, HR platform for admission of students' recruitment, payroll will be impossible to operate.

2. Resistance to Change: Many staff members prefer manual systems due to limited digital literacy especially when it comes to record keeping. This resistance is fueled by fears of job loss, unfamiliarity with AI and mistrust in technology.

3. Policy Gaps: Absence of comprehensive AI-in-education policies hampers sustainable adoption (NITDA, 2023).

4. Financial Constraints: Cost of installing and maintaining AI is very high. Already educational institutions' in the country has been battling with low budget constraint. High cost of AI solution and system maintenance limits scalability. Moreover, 2023 budgetary allocation are often insufficient compared to 15-2% of national expenditure. (UNESCO)

5. Ethical Concerns: Issues of data privacy and bias in AI algorithms pose additional risks. Without strong data protection laws and enforcement, the risk of data breaches and misuse remains high (NITDA, 2023). This makes some institutions reluctant to digitize their HRM systems fully.

6. Unreliable Power Supply: Constant power supply is required for the utilization of AI systems, digital HRM platforms and cloud-based solutions but unfortunately many schools especially in rural areas experience frequent power outages making it difficult for effective utilization of the digital platform.

Way Forward

Despite these challenges, the prospects for AI and digital connectivity in HRM are significant:

1. Government should prioritize investment in ICT infrastructure, they can partner with private telecom operators to increase internet penetration in rural schools
2. Federal ministry of education should sensitize the leaders of various institutions to promote change management programmes and expand broadband and electricity infrastructure.
3. Federal government through ministry should ensure the development of a national AI-in-education policy framework
4. Budgetary allocation is often insufficient compared to 15-2% of national expenditure as stipulated by UNESCO. Government should adhere strictly to UNESCO recommendation.
5. Stakeholders can partner with the institution to Institution to mount continuous training. AI-powered learning systems can personalize professional development, Implement digital literacy training for HR personnel and educators

CONCLUSION

AI and digital connectivity represent transformative tools for the management of human resources in Nigerian

education. While current practices remain inefficient and manual. Emerging applications demonstrate potential for improving institutional transparency, accountability, and efficiency. However, systemic barriers such as infrastructure deficits, digital illiteracy, and policy gaps must be addressed.

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