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Will Artificial Intelligence Replace Humans? An Industrial Sociological Inquiry into Employment, Education, and the Future of Work in Nigeria

By

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Abstract

The growing integration of Artificial Intelligence into production systems, service delivery, and organisational management has intensified concerns regarding the future relevance of human labour within emerging digital economies. Against this background, this paper examined Will Artificial Intelligence Replace Humans? An Industrial Sociological Inquiry into Employment, Education, and the Future of Work. The paper specifically investigated how artificial intelligence is reshaping employment opportunities and job roles across sectors of the economy, assessed its implications for workers' job security and workplace relations in contemporary organisations, and analysed its implications for the future organisation of work and human labour in Nigeria. The paper was anchored on Skill-Biased Technological Change Theory, which explains how technological advancement disproportionately rewards workers with higher-order technical competencies while exposing routine-based occupations to displacement. Analytical review method was adopted, involving a critical examination and synthesis of recent theoretical and empirical literature published between 2020 and 2026. The paper revealed that artificial intelligence is not eliminating work entirely but is restructuring occupational roles through task automation and task enhancement. The paper further found that while AI improves efficiency and productivity, it also introduces job insecurity and alters workplace authority through algorithm-driven control systems. Within Nigeria, the findings showed that weak educational adaptation, inadequate digital infrastructure, and limited workforce reskilling mechanisms pose significant barriers to inclusive participation in AI-driven labour markets. The paper concluded that artificial intelligence will redefine rather than replace human labour, with outcomes dependent on institutional preparedness. It recommended curriculum reform, structured workforce reskilling, and the development of regulatory frameworks to ensure responsible and human-centred technological transition.

KEYWORDS: *Artificial Intelligence, Human Labour, Employment Restructuring, Educational Adaptation, Future of Work, industrial Sociology, Nigeria.*

1. INTRODUCTION

The question of whether artificial intelligence (AI) will replace human labour has moved from speculative debate to a pressing sociological concern as governments, firms, and educational institutions respond to changes in production systems and labour organization. Across the global economy, AI is altering how work is structured, how skills are valued, and how labour markets absorb technological change. Recent evidence from the World Economic Forum indicates that by 2030, technological shifts, especially AI and information-processing systems, may create approximately 170 million new jobs while displacing 92 million existing roles, producing a net increase of 78 million jobs globally, but with significant occupational restructuring across clerical, administrative, and routine cognitive work (World Economic Forum, 2025). This finding suggests that the issue is not simply job loss, but a redefinition of labour itself.

From an industrial sociological standpoint, this transformation raises questions about technological determinism, labour substitution, workplace control, and skill polarization. Studies show that AI adoption is already changing task allocation in sectors such as finance, healthcare, education, media, and manufacturing. Del Rio-Chanona et al. (2025) report that generative AI has produced productivity gains ranging between 20% and 60% in controlled workplace studies,

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particularly for routine analytical tasks, while also reducing demand for certain entry-level knowledge work. Such shifts reflect earlier industrial transitions where mechanization displaced some categories of labour while expanding demand for others, though AI differs because it increasingly performs cognitive and decision-support tasks once considered uniquely human.

At the regional level, advanced economies are investing heavily in workforce adaptation. Across Europe, workplace surveys covering over 36,000 workers in 35 countries found that generative AI adoption averaged 12% by 2026, with uptake concentrated among highly digitalized workplaces and employees with stronger technical literacy (Henseke, 2026) . In education systems, institutions are redesigning curricula to include AI literacy, computational reasoning, and human-machine collaboration. Denny et al. (2024) note that generative AI is already reshaping teaching, assessment design, and student learning behaviour, compelling universities to reconsider how knowledge and competence are evaluated.

Within Africa, the challenge is sharper because labour markets remain vulnerable to technological exclusion due to weak digital infrastructure, uneven access to advanced training, and policy implementation gaps. While AI offers opportunities for productivity growth, automation without parallel investment in human capital could widen inequality and deepen unemployment among low-skilled and semi-skilled workers. This concern is particularly relevant in Nigeria, where unemployment and underemployment remain structural labour market concerns. According to the National Bureau of Statistics, Nigeria's unemployment rate stood at 4.3% in Q2 2024 under the revised labour force methodology, while underemployment and informal employment remain dominant realities for millions of workers.

Nigeria's educational institutions are also under pressure to respond. Many tertiary institutions still operate curricula that give limited attention to AI competence, digital problem-solving, and interdisciplinary technological literacy. Yet employers increasingly demand these capabilities. The Federal Government's AI policy initiatives signal awareness of this shift, but institutional preparedness remains uneven. For industrial sociology, this moment calls for critical inquiry into whether AI will become a force for labour enhancement or labour displacement, and how social institutions such as education, policy systems, and workplace organizations mediate this transition.

The paper, *Will Artificial Intelligence Replace Humans? An Industrial Sociological Inquiry into Employment, Education, and the Future of Work*, is therefore situated within ongoing debates about the social consequences of automation. It examines not only technological capability but also how social structures shape who benefits, who is excluded, and what forms of work will remain distinctly human.

2. STATEMENT OF THE PROBLEM

The growing integration of artificial intelligence into workplaces, educational systems, and production processes has generated concern regarding the future of human labour. While AI-driven systems are increasing efficiency, reducing operational costs, and improving decision-making across sectors, uncertainty persists about whether these gains will complement human labour or displace substantial segments of the workforce. Existing global evidence presents mixed outcomes. Although projections suggest net job creation by 2030, the displacement of 92 million jobs points to substantial occupational disruption, particularly for workers engaged in repetitive administrative, clerical, and routine analytical functions (World Economic Forum, 2025) .

The problem becomes more pronounced in developing economies such as Nigeria, where labour markets are already strained by graduate unemployment, inadequate industrial absorption capacity, and persistent skill mismatches between educational outputs and labour market expectations. As AI systems enter sectors such as banking, customer service, education, media production, and public administration, there is increasing concern that workers lacking digital competence may face exclusion. This raises critical sociological questions about labour inequality, technological access, and the restructuring of class relations within industrial systems.

Another dimension of the problem lies in the educational sector. Many Nigerian universities and technical institutions have not sufficiently integrated AI-related competencies into their curricula, creating a gap between educational preparation and future workplace requirements. Without deliberate adaptation, graduates may enter labour markets unprepared for AI-mediated work environments. This threatens employability and weakens national competitiveness in an economy where technological capability increasingly determines productivity.

Despite rising public discourse on AI and employment, there remains limited analytical and sociological inquiry within Nigeria examining whether AI constitutes a substitute for human labour or a tool for labour enhancement. Much of the current discussion is framed through technological or economic perspectives, with insufficient attention to industrial sociological issues such as workplace power relations, labour process restructuring, educational adaptation, and institutional readiness. This paper addressed this gap by investigating how AI is shaping employment, education, and the future of work, with particular attention to the Nigerian context.

3. AIM AND OBJECTIVES OF THE PAPER

The aim of this paper was to examine the implications of artificial intelligence for human labour by investigating its influence on employment patterns, educational adaptation, and the changing structure of work within an industrial sociological framework.

Specific Objectives of the Paper

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1. To examine how artificial intelligence is reshaping employment opportunities and job roles across different sectors of the economy.
2. To assess the implications of artificial intelligence for workers' job security and workplace relations in contemporary organizations.
3. To analyse the influence of artificial intelligence for the future organization of work and human labour in Nigeria.

4. METHODOLOGY

The methodology adopted in this paper is the analytical review method, which involves the systematic examination, synthesis, and critical interrogation of existing empirical and theoretical literature relevant to a research problem in order to generate reasoned interpretations and scholarly conclusions. This method is particularly suitable for studies that seek to understand emerging social phenomena where broad-based conceptual clarification and interpretive evaluation of existing evidence are required. According to Hannah Snyder (2020), analytical review provides a structured process for identifying, evaluating, and integrating existing studies to establish conceptual patterns, contradictions, and unresolved issues within a field of inquiry.

Similarly, Booth et al. (2021) explain that the criteria guiding analytical review include relevance of selected literature to the research objectives, recency of evidence, methodological rigour of reviewed studies, consistency of analytical interpretation, and the capacity of reviewed materials to address identified gaps. In this paper, these criteria informed the selection of recent peer-reviewed studies published between 2020 and 2026 on artificial intelligence, employment restructuring, workplace relations, educational adaptation, and the future of work. The method enabled a careful interrogation of contemporary arguments, empirical findings, and theoretical positions concerning whether artificial intelligence constitutes a substitute for human labour or a transformative force altering occupational structures. Its adoption is justified because the subject under investigation remains dynamic and evolving, making it necessary to draw from multiple disciplinary perspectives in order to produce a grounded industrial sociological interpretation.

The analytical review method is particularly appropriate for this study because it allows for the integration of labour market evidence, organisational case illustrations, educational transformation analyses, and theoretical explanations into a coherent framework for understanding the implications of artificial intelligence for human work. Since the paper sought to examine employment restructuring, workplace relations, and future labour organisation from an industrial sociological standpoint, direct field-based investigation alone would not sufficiently capture the breadth of recent global developments required for a balanced assessment. The method therefore offered the flexibility to compare findings from different socio-economic contexts and identify patterns applicable to Nigeria's labour environment. This approach is consistent with the view of Petticrew and Roberts (2022), who argue that analytical review is effective for synthesising dispersed evidence where policy and institutional implications are central to the inquiry.

However, the method is not without limitations. One limitation is its dependence on already published materials, which may reflect contextual biases or omit emerging local realities not yet documented in academic literature. Another constraint is that it does not generate primary data from workers or organisations, thereby limiting direct observation of lived experiences and institutional responses within the Nigerian context. In this paper, while the analytical review method provides strong conceptual and interpretive depth, it cannot fully capture sector-specific realities of AI adoption in Nigeria, making empirical field-based follow-up studies necessary for deeper contextual validation.

5. LITERATURE REVIEW

Conceptual Review

Artificial Intelligence

Artificial intelligence has attracted sustained scholarly attention as its application expands across production systems, decision-making processes, and organizational management. Recent scholarship defines artificial intelligence as computational systems capable of performing tasks that traditionally require human intelligence, including reasoning, learning, pattern recognition, language processing, and autonomous decision support. According to Russell and Norvig (2021), AI refers to the design of intelligent agents that perceive their environment and act in ways that maximize the likelihood of achieving specified goals. This systems-oriented definition emphasizes functionality rather than imitation of human cognition.

Brynjolfsson and McAfee (2022) argue that AI should be understood as a general-purpose technology capable of reshaping productivity and labour allocation across sectors, much like electricity and computing in earlier industrial eras. Their view foregrounds AI's transformative role in economic restructuring. However, Bender et al. (2021) challenge purely technical interpretations, arguing that AI systems are socio-technical constructs whose outputs reflect human choices, institutional arrangements, and embedded biases. This critique is useful because it shifts attention from technological capability to social consequences. For the purpose of this paper, the definition advanced by Russell and Norvig (2021) is adopted, while acknowledging Bender et al.'s caution, such that artificial intelligence is conceived as computational systems designed to execute human-like cognitive functions within socially structured industrial environments.

Human Labour

Human labour remains a central concept in industrial sociology because it captures the relationship between workers, production systems, and social organization. Contemporary scholars conceptualize human labour not merely as physical effort but as the deployment of intellectual, emotional, technical, and social capacities in productive activity. Standing (2021) defines human labour as the organized application of human capabilities toward the

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production of goods and services within institutionalized economic relations. This perspective extends beyond wage employment to include knowledge-based and service-oriented labour.

Autor (2022) argues that human labour should be understood through task specificity, noting that workers possess adaptive judgment, contextual reasoning, and relational intelligence that remain difficult to automate. This argument is particularly relevant in discussions of AI substitution. By contrast, Acemoglu and Restrepo (2020) present labour as vulnerable to technological displacement where machines perform tasks more efficiently, especially routine cognitive and manual activities. Their view highlights the structural risks posed by automation. While this argument is empirically grounded, it does not sufficiently account for human agency and adaptive reskilling. This paper therefore adopts Autor's (2022) conception because it better captures the continuing significance of human interpretive and relational capacities within technologically mediated workplaces.

Future of Work

The concept of the future of work addresses anticipated transformations in employment structures, workplace organization, skill requirements, and labour relations arising from technological advancement. Recent scholars view it as a process of labour reconfiguration rather than a fixed endpoint. Susskind (2020) defines the future of work as the changing relationship between technological systems and human employment in response to automation and digital integration. His argument is that technology may reduce reliance on human labour in many sectors while creating demand for entirely new occupational categories.

Complementing this, Felten et al. (2021) conceptualize the future of work through occupational exposure to AI, showing that work will increasingly be shaped by collaboration between human workers and intelligent systems. Their analysis suggests transformation rather than wholesale replacement. However, Frey (2023) warns that the future of work may deepen labour market inequality where adaptation mechanisms fail. This concern is particularly relevant for developing economies with weaker educational and industrial transitions. The conception adopted in this paper aligns with Felten et al. (2021), which sees the future of work as a process of restructuring where AI modifies tasks, competencies, and occupational arrangements while preserving space for human contribution.

Educational Adaptation

Educational adaptation refers to the adjustment of educational systems, curricula, teaching practices, and institutional strategies to prepare learners for changing socio-economic and technological realities. In the context of AI, this concept addresses how formal education responds to shifting workplace skill demands. Luckin and Cukurova (2022) define educational adaptation as the deliberate restructuring of pedagogy and curriculum to align with technological advancement and emerging labour market expectations. Their emphasis is on responsiveness and relevance. Holmes et al. (2021) extend this view by arguing that educational adaptation involves embedding digital literacy, computational thinking, and ethical understanding of AI into learning systems. This perspective recognizes that technical competence alone is insufficient.

Nonetheless, Selwyn (2022) critiques adaptation frameworks that treat education merely as an instrument for labour market supply, arguing that education must also cultivate critical reflection about technology itself. This caution is important because it guards against narrow vocationalism. For this paper, educational adaptation is understood through Holmes et al.'s (2021) formulation as the strategic modification of educational structures to equip learners with technical, analytical, and ethical capacities necessary for AI-mediated work environments.

Industrial Sociological Perspective

The industrial sociological perspective examines work, labour relations, technological change, and organizational structures as socially embedded processes shaped by power relations, institutional norms, and economic systems. It provides a critical framework for understanding how AI affects employment beyond technical efficiency. Thompson and McHugh (2021) define industrial sociology as the study of work organizations and the social relations generated within production systems. Their view highlights the interaction between labour, management, and technology.

Fleming (2021) extends this perspective by arguing that industrial sociology must interrogate how digital technologies reorganize managerial control, worker autonomy, and surveillance within workplaces. This interpretation is highly relevant to AI-driven work systems. Vallas and Schor (2020) further contend that technological transformations should be analyzed in terms of labour precarity and shifting control mechanisms rather than neutral innovation. Their contribution is significant because it reveals how automation may reinforce structural inequality. This paper adopts Fleming's (2021) perspective because it directly addresses the sociological implications of intelligent technologies in reshaping authority, labour processes, and workplace relations.

How Artificial Intelligence is Reshaping Employment Opportunities and Job Roles Across Different Sectors of the Economy

Artificial intelligence has become one of the defining forces shaping labour restructuring across contemporary economies. Its influence is evident not merely in job displacement but in the reconfiguration of occupational roles, task specialization, and labour market demand. Industrial sociology interprets this transformation as part of broader shifts in labour processes where technology reorganizes production relations and redistributes control within workplaces. Recent studies indicate that AI adoption has shifted labour demand away from routine and repetitive functions toward occupations requiring analytical reasoning, adaptive decision-making, and interpersonal coordination (Acemoglu & Johnson, 2023). This transition is particularly visible across finance, healthcare,

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manufacturing, education, media, and public administration as discussed by each sector below:

i. Manufacturing Sector

In manufacturing, AI-driven automation has altered traditional production systems through predictive maintenance, robotic process control, and autonomous quality assurance systems. Brynjolfsson and McAfee (2022) note that advanced manufacturing firms deploying machine learning systems report productivity gains exceeding 20% in some sectors, while reducing demand for repetitive assembly-line tasks. Tesla's automated production facilities illustrate this transformation. While the company has increased output through robotics and AI-integrated assembly systems, it has simultaneously created new occupational categories such as robotics supervisors, machine learning process analysts, and industrial data engineers. This pattern supports Autor's (2022) task-based analysis, which argues that technological change rarely eliminates entire occupations but modifies task composition within them.

ii. Financial Sector

The financial sector offers another important example. AI systems now execute credit scoring, fraud detection, algorithmic trading, and customer interaction functions. Jarrahi et al. (2023) observe that banks adopting AI have reduced demand for clerical workers while expanding opportunities for cybersecurity analysts, data governance officers, and algorithm auditors. JPMorgan Chase's deployment of its COIN platform, which automates contract analysis previously handled by legal support staff, reportedly reduced thousands of hours of manual review annually. Such developments reveal how cognitive automation is shifting labour demand from procedural processing to oversight and exception management.

iii. Healthcare Sector

Healthcare has experienced similar occupational transformation. AI-assisted diagnostic systems now support radiology, pathology, and clinical decision-making. Topol (2023) argues that AI does not replace physicians but redistributes clinical responsibilities by automating pattern-recognition tasks while increasing the importance of interpretive judgment and patient-centred care. In hospitals using AI-supported imaging systems, radiologists increasingly perform verification, contextual interpretation, and treatment planning rather than primary detection. This has generated new professional roles involving AI integration management and clinical informatics.

iv. Educational Sector

The education sector demonstrates another layer of employment restructuring. Generative AI tools have altered instructional design, assessment practices, and academic support functions. Kasneci et al. (2023) note that AI-enabled educational technologies have reduced reliance on routine grading and content generation tasks while increasing demand for instructional designers capable of integrating AI responsibly into pedagogy. Universities are now creating positions such as AI curriculum coordinators and digital learning architects.

v. Media and Creative Industries

Media and creative industries have also witnessed occupational shifts. AI-assisted content generation platforms are increasingly used for drafting, editing, translation, and audience analytics. While some entry-level writing and production roles face contraction, new functions in AI-assisted editorial supervision and content authenticity verification are emerging (Mollick, 2024).

Industrial sociological inquiry shows that these developments are not neutral technological outcomes. They are shaped by institutional choices regarding implementation, regulation, and workforce adaptation. Acemoglu and Restrepo (2020) caution that where AI is adopted primarily for labour substitution rather than augmentation, job polarization intensifies. This has been observed in call centres where conversational AI systems reduce frontline staffing while concentrating work among fewer high-skilled supervisors.

In emerging economies, these effects are more uneven. Labour-intensive sectors often experience delayed but sharper disruptions due to weak reskilling systems. For Nigeria, banking offers practical illustration. The expansion of AI-powered customer service bots by financial institutions such as GTBank and Access Bank has reduced reliance on traditional front-desk support while increasing demand for backend digital systems specialists. Similar patterns are visible in telecommunications and logistics. The key analytical insight is that AI is reshaping employment through occupational recomposition rather than simple replacement. The labour market increasingly rewards digital fluency, adaptive reasoning, and socio-emotional competence. Industrial sociology interprets this as a reordering of workplace stratification where technological literacy becomes a major determinant of occupational mobility.

The Implications of Artificial Intelligence for Workers' Job Security and Workplace Relations in Contemporary Organizations

Artificial intelligence raises critical questions about job security and workplace relations because it alters managerial authority, labour control, surveillance practices, and employment stability. Industrial sociology has long examined how technological change redistributes power between workers and management. AI introduces a distinct phase of labour control because decision-making systems increasingly influence hiring, evaluation, task assignment, and performance monitoring.

Job security concerns are strongly associated with automation exposure. Felten et al. (2021) demonstrate that occupations involving structured cognitive tasks face higher AI exposure than occupations requiring human judgment and interpersonal engagement. Clerical, administrative, and customer support roles are especially vulnerable. This vulnerability has practical consequences. IBM's 2023 workforce restructuring publicly acknowledged that nearly 30% of certain back-office roles could be replaced through AI and automation over five years. This decision illustrates how organizations increasingly treat AI as a substitute for routine administrative labour.

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However, job insecurity is not solely about redundancy. It also concerns role degradation, increased performance pressure, and contractual instability. Fleming (2021) argues that digital technologies intensify managerial control by enabling real-time surveillance and productivity benchmarking. AI-powered monitoring systems in logistics companies such as Amazon exemplify this dynamic. Warehouse workers are tracked through algorithmic performance systems that measure speed, movement, and task completion with minimal managerial discretion. Vallas and Schor (2020) argue that such systems shift workplace authority from human supervisors to algorithmic governance, reducing workers' ability to negotiate labour conditions.

This has implications for workplace relations. Traditional organizational relations involve negotiation, informal discretion, and social interaction between workers and supervisors. AI-mediated management often reduces these relational dimensions. Kellogg et al. (2020) describe this as algorithmic control, where software systems shape work pace, scheduling, and evaluation. In ride-hailing platforms such as Uber, driver performance is governed through ratings and automated allocation systems, limiting direct managerial interaction while intensifying worker dependence on opaque digital systems.

AI also affects workplace trust. Where employees perceive algorithmic systems as biased or unaccountable, organizational commitment declines. Bogen and Rieke (2020) found that automated recruitment systems often reproduce existing biases when trained on skewed datasets. Workers subjected to such systems may experience procedural injustice, leading to tension and distrust. At the same time, AI can improve workplace relations when implemented collaboratively. In healthcare organizations, AI-supported decision systems have reduced diagnostic workload and improved interdisciplinary collaboration when workers retain interpretive authority (Topol, 2023). Similarly, firms using AI as assistive rather than supervisory technology report improved worker satisfaction and reduced burnout.

For Nigeria, workplace relations are shaped by structural vulnerabilities such as weak labour protections, informal employment, and limited collective bargaining coverage in emerging digital sectors. AI adoption in Nigerian financial services has improved efficiency but also reduced traditional customer-facing employment. Employees increasingly face pressure to acquire digital competencies without corresponding institutional support. In outsourcing and customer service industries, chatbot integration has reduced routine call-centre staffing while increasing performance expectations for remaining workers.

Labour unions also face adjustment pressures. Traditional collective bargaining frameworks were designed around human managerial authority, not algorithmic systems. This creates regulatory gaps. Workers often cannot challenge automated evaluations because decision criteria remain proprietary. From an industrial sociological perspective, AI transforms workplace relations by redefining authority, accountability, and surveillance. Its implications for job security depend on whether organizations pursue augmentation or substitution strategies. Where AI complements labour, it can improve working conditions. Where it replaces or intensifies labour without participation mechanisms, insecurity and workplace tension increase.

The Influence of Artificial Intelligence for the Future Organization of Work and Human Labour in Nigeria

The future organization of work in Nigeria will be significantly influenced by the pace, direction, and governance of artificial intelligence adoption. Nigeria presents a distinctive case because its labour market combines a large informal economy, youth unemployment, educational inequality, and uneven technological infrastructure. Industrial sociology situates these realities within broader questions of labour restructuring, institutional adaptation, and social stratification.

One major implication concerns labour market polarization. AI is likely to increase demand for highly skilled digital professionals while reducing opportunities for routine clerical and administrative workers. This pattern is already visible in Nigerian banking and telecommunications. Digital banking systems powered by AI now perform account verification, fraud detection, and customer support functions once handled manually. While these technologies create openings for software engineers, AI analysts, and cybersecurity specialists, they reduce opportunities for lower-level administrative personnel. Nigeria's public sector may also face restructuring pressures. Ministries and agencies are gradually adopting automated records management and digital service systems. If scaled, such systems could reduce demand for clerical staff. Given that public administration remains a major source of formal employment, this raises significant employment policy concerns.

Another implication involves informal sector adaptation. Unlike advanced economies, Nigeria's labour market is heavily informal, accounting for over 80% of employment according to recent labour assessments. AI may affect this sector through digital platforms, mobile financial systems, and logistics automation. E-commerce expansion has created new forms of gig work such as digital delivery coordination, online sales support, and platform-based service provision. Yet these opportunities often lack job security, social protection, and stable earnings.

Education presents perhaps the most decisive factor shaping Nigeria's future of work. Current tertiary curricula often remain disconnected from AI-related labour demands. Many institutions still emphasize theoretical instruction with limited exposure to machine learning, data systems, or computational problem-solving. This creates a mismatch between graduate capabilities and evolving occupational expectations. Without significant curriculum reform, many Nigerian graduates risk exclusion from emerging labour markets.

The rise of remote work and digital labour platforms also has important implications. Nigerian software developers, digital marketers, and content specialists increasingly participate in

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global freelance markets through platforms such as Upwork and Turing. AI could expand these opportunities by lowering entry barriers to digital production. At the same time, it may intensify competition as global labour pools become more interconnected. Organizational structures are also likely to change. Nigerian firms adopting AI may shift toward leaner hierarchies, project-based teams, and data-driven management systems. This could improve efficiency but may weaken traditional pathways of organizational progression. Middle-management roles, often central to coordination and supervision, may contract as decision-support systems automate monitoring and reporting functions.

A practical illustration can be seen in Nigeria's fintech sector. Companies such as Flutterwave and Paystack increasingly rely on AI-enabled fraud detection and transaction monitoring. These systems reduce manual operational processes while creating demand for advanced technical expertise. Similar patterns are emerging in agriculture, where AI-supported precision farming tools are beginning to influence labour allocation.

The future of human labour in Nigeria will therefore depend on institutional preparedness. If educational reform, labour regulation, and digital infrastructure investment advance together, AI can support employment upgrading and productivity growth. If adaptation remains weak, AI may deepen unemployment, inequality, and occupational exclusion. Industrial sociology emphasizes that technological outcomes are socially mediated. AI will not determine Nigeria's labour future independently. Its consequences will reflect policy choices, organizational strategies, and the capacity of social institutions to manage technological transition.

Empirical Review

Acemoglu and Restrepo (2022) carried out a study on artificial intelligence and labour market restructuring with particular focus on automation and employment displacement in the United States. The investigation was conducted across several industrial sectors including manufacturing, administrative services, logistics, and retail. The study was anchored on the task-based theory of technological change, which explains how technological innovation reallocates tasks between machines and workers based on efficiency and comparative capability. A longitudinal quantitative research design was adopted using panel data analysis. The researchers utilised labour market records covering over 1.2 million workers across different states, selected through stratified industrial classification. Data were obtained through secondary datasets from labour market surveys and employment records, complemented by firm-level productivity statistics.

Their findings revealed that AI-driven automation significantly reduced demand for workers engaged in repetitive cognitive and manual tasks, particularly in clerical and low-skill production roles, while creating specialised openings in software engineering, systems maintenance, and algorithmic supervision. The authors concluded that technological adoption alters labour composition more than it eliminates work entirely, though this transition often favours highly educated workers. The study offers strong empirical grounding for understanding labour restructuring under AI. However, its emphasis on advanced industrial economies limits its relevance to contexts where informal employment dominates. The gap identified lies in the absence of analysis on developing economies such as Nigeria where educational preparedness and labour market informality may produce different outcomes. The present paper addressed this omission by examining AI-induced employment changes within the Nigerian industrial setting.

Felten et al. (2021) examined occupational exposure to artificial intelligence and the changing nature of workplace relations across sectors in the United States. Their work focused on finance, health services, education, legal practice, and customer service industries. The research drew on labour substitution theory and sociotechnical systems theory to explain the interaction between intelligent systems and human occupational functions. The study employed a cross-sectional analytical design using occupational data from the Occupational Information Network database. A sample of 769 occupational classifications was analysed through purposive selection based on exposure to AI-related tasks. Data collection relied on structured occupational descriptors, machine learning exposure indices, and institutional employment statistics. The findings indicated that occupations involving predictable analytical tasks were highly susceptible to AI integration, whereas occupations requiring interpersonal judgement, emotional intelligence, and contextual reasoning remained less exposed.

The authors also observed that AI implementation often changed workplace authority structures by shifting supervisory oversight towards algorithm-driven evaluation systems. Their conclusion was that artificial intelligence is not replacing whole professions but redefining task allocation and altering organisational power dynamics. This investigation contributes significantly to industrial sociological discussions on algorithmic management and labour transformation. Nevertheless, the study is constrained by its concentration on occupational classification without direct engagement with worker experiences in institutional settings. Furthermore, its evidence is derived from highly digitised economies with mature technological infrastructure. The unresolved issue concerns how similar transitions manifest within labour markets characterised by institutional fragility, educational mismatch, and weak labour regulation. This current paper addressed this gap by interrogating these issues in relation to Nigeria's emerging AI environment.

Kasneci et al. (2023) conducted a study on generative artificial intelligence and educational transformation, with attention to implications for future work and skill development. The study covered higher education institutions across Germany, the United Kingdom, and selected European digital learning environments. It was informed by human capital theory and adaptive learning systems theory, both of which explain the relationship between educational innovation

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and labour market competitiveness. A mixed-method research design was adopted, combining survey research with qualitative expert interviews. The sample comprised 3,200 university students, 480 lecturers, and 75 academic technology specialists selected through multistage sampling across participating institutions. Data were collected through online questionnaires, semi-structured interviews, and institutional policy document analysis.

The study found that generative AI tools significantly influenced teaching practice, assessment design, student learning behaviour, and digital competence acquisition. It further revealed that institutions integrating AI literacy into curricula reported stronger student preparedness for digital employment environments. The researchers concluded that educational systems unable to adapt quickly risk producing graduates whose competencies do not align with emerging workplace realities. This study is particularly relevant because it links educational adaptation directly to labour market preparedness. Its major strength lies in combining institutional and learner perspectives. However, the European focus means that its findings may not adequately explain conditions in countries where educational infrastructure remains uneven and policy implementation is inconsistent. The unresolved concern is how tertiary institutions in Nigeria are responding to AI-related curricular demands and whether such responses are sufficient for future labour market participation. This present paper filled this empirical gap by examining educational adaptation and the future of human labour from an industrial sociological perspective within Nigeria.

Theoretical Framework: Skill-Biased Technological Change Theory

Skill-Biased Technological Change (SBTC) Theory was advanced by Daron Acemoglu and developed extensively in labour economics and industrial sociology through his collaborative works with Pascual Restrepo, particularly from 2018 onward, with stronger contemporary articulation in Acemoglu and Restrepo's 2022 work on automation, task displacement, and labour market restructuring. The theory emerged from earlier technological change debates but gained renewed analytical relevance in explaining the effects of artificial intelligence, machine learning, and digital automation on modern labour systems.

The central proposition of the theory is that technological advancement does not affect all categories of labour uniformly; rather, it increases demand for workers possessing higher-order technical, analytical, and adaptive skills while reducing demand for workers engaged in routine and easily codifiable tasks. According to Acemoglu and Restrepo (2022), technology becomes "skill-biased" because it complements workers with specialised capabilities while substituting those whose functions can be replicated through computational systems. This assumption is particularly useful for examining AI because artificial intelligence increasingly performs cognitive and operational activities previously undertaken by humans.

The theory rests on several foundational assumptions. It assumes that technological innovation restructures labour markets through task reallocation rather than total occupational elimination. It also presumes that workers differ in their capacity to adapt to technological change based on educational attainment, technical exposure, and access to reskilling opportunities. Another key assumption is that institutions such as schools, training centres, firms, and policy systems mediate the distributional consequences of technological advancement. Thus, where educational systems are responsive and adaptive, workers are more likely to benefit from technological shifts; where such systems remain static, labour displacement and inequality become more pronounced. The theory further assumes that technological transitions generate labour market polarisation by expanding opportunities at the upper end of the skills spectrum while compressing opportunities for low- and middle-skilled workers.

One major strength of the Skill-Biased Technological Change Theory lies in its strong empirical grounding. It offers a practical explanation for observed patterns of employment restructuring across manufacturing, finance, education, logistics, and digital service sectors. It explains why AI adoption often creates new professional categories such as machine learning engineers, algorithm auditors, digital compliance specialists, and AI ethics consultants while simultaneously reducing demand for clerical personnel, administrative assistants, and routine data processors. The theory is also valuable because it recognises that technological outcomes are mediated by institutional preparedness, making it highly relevant for analysing educational adaptation and labour policy. Its explanatory relevance has been validated across several recent empirical studies examining automation and occupational transformation (Autor, 2022; Felten et al., 2021).

Despite these strengths, the theory has notable weaknesses. It tends to privilege economic and occupational dimensions of technological change while paying less attention to workplace power relations, managerial control, and social resistance, which are central concerns in industrial sociology. The framework also assumes relatively rational institutional responses to technological change, yet in many developing economies adaptation is constrained by policy inconsistency, infrastructural deficits, and uneven educational quality. Another limitation is that it does not fully account for informal labour systems, which dominate employment structures in countries such as Nigeria. Since much Nigerian employment occurs outside highly formalised industrial settings, the theory requires contextual interpretation when applied beyond advanced industrial economies.

The theory provides a strong analytical basis for understanding how AI is reshaping employment opportunities by privileging workers with digital and analytical competencies while exposing routine-based occupations to displacement. It explains the growing concern over educational adaptation because institutions that fail to equip students with technologically relevant skills risk producing

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graduates unable to compete in AI-mediated labour markets. Within the Nigerian context, the theory clarifies why AI adoption may widen existing inequalities where access to digital education remains uneven. It also offers a framework for examining future workplace organisation, particularly the movement toward data-driven production systems and leaner organisational structures. From an industrial sociological standpoint, the theory supports the argument that artificial intelligence is unlikely to eliminate human labour entirely; rather, it will reorder labour hierarchies, alter skill demands, and redefine occupational relevance. This makes it the most suitable theoretical foundation for interrogating whether AI will replace humans or merely transform the conditions under which human labour is organised and valued.

6. RESULTS AND DISCUSSIONS

The findings of this paper indicate that artificial intelligence is reshaping employment opportunities and redefining occupational roles across contemporary economies through task substitution and task enhancement rather than wholesale labour elimination. This outcome aligns with the position advanced by Acemoglu and Restrepo (2022), who contend that automation restructures labour demand by displacing routine-based work while generating specialised technical functions. The evidence reviewed in this paper supports this argument, particularly in sectors such as finance, manufacturing, healthcare, and education where AI systems now perform repetitive analytical functions previously handled by human workers. For instance, automated fraud detection systems in digital banking have reduced dependence on manual verification officers while increasing demand for cybersecurity specialists and algorithmic compliance analysts.

Similarly, AI-assisted diagnostic tools in healthcare have shifted professional responsibility from primary detection to interpretation and decision support. These examples demonstrate that the question is not whether work will disappear, but how occupational identities are being reconstructed. Autor's (2022) position that technology alters task composition rather than erasing professions entirely is strongly reflected in these findings. From an industrial sociological standpoint, this suggests a reorganisation of labour hierarchies in which workers possessing digital adaptability increasingly occupy strategic positions within production systems, while those lacking such capacities face occupational marginalisation.

The paper further revealed that artificial intelligence has profound implications for workers' job security and workplace relations. This conclusion is consistent with the analysis of Kellogg, Valentine and Christin (2020), who observe that algorithmic management systems are transforming workplace authority by embedding surveillance and evaluation within computational processes. The review identified that AI adoption often intensifies managerial oversight, particularly where algorithm-driven performance assessment replaces human supervisory discretion. Practical illustrations such as automated productivity tracking in warehouse operations and AI-powered monitoring in customer service environments demonstrate how workers are increasingly subjected to data-centred evaluation regimes.

Fleming's (2021) argument that digital systems may deepen organisational control is therefore strongly validated. However, the paper also showed that workplace outcomes are contingent upon implementation strategy. In contexts where AI is deployed as assistive technology, such as AI-supported clinical decision systems in hospitals, workers often experience reduced routine burden and stronger collaborative efficiency. This supports Topol's (2023) contention that intelligent systems can augment rather than diminish professional autonomy when human interpretive authority is preserved. Industrial sociology interprets this dual outcome as evidence that technology itself is not inherently oppressive; rather, organisational choices determine whether AI strengthens labour participation or reproduces asymmetrical power relations.

Regarding the future organisation of work and human labour in Nigeria, the paper found that AI presents both developmental opportunity and structural risk. This reflects the concerns raised by Kasneci et al. (2023) and Holmes et al. (2021), who argue that educational responsiveness is central to technological adaptation. The Nigerian labour environment, characterised by graduate unemployment, educational mismatch, and a dominant informal sector, creates a particularly fragile setting for AI-driven labour transformation. The paper suggest that sectors such as banking, fintech, telecommunications, and digital commerce are already experiencing occupational shifts, with traditional clerical functions declining while demand rises for technical specialists. Practical examples include AI-enabled transaction monitoring within Nigerian fintech firms and chatbot integration in customer service operations.

Yet these transitions expose a significant institutional weakness: many tertiary institutions remain inadequately positioned to prepare graduates for digitally mediated work systems. This validates Selwyn's (2022) warning that educational systems focused solely on conventional instruction risk producing labour market irrelevance. From an industrial sociological perspective, this reveals that Nigeria's future of work will depend less on the pace of technological importation and more on the capacity of educational and regulatory institutions to facilitate workforce adaptation.

The Skill-Biased Technological Change Theory adopted in this paper provides a strong explanatory basis for these findings. The theory's central assumption that technological innovation disproportionately favours highly skilled labour while displacing routine functions is clearly reflected in the reviewed evidence. The occupational restructuring observed across sectors, the vulnerability of workers lacking digital competence, and the growing premium placed on adaptive technical skills all affirm the theory's predictive strength. Acemoglu and Restrepo's (2022) argument that institutions mediate technological outcomes is particularly relevant to the Nigerian context, where weak educational adaptation and uneven digital infrastructure shape labour vulnerability.

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The findings demonstrate that AI is not an autonomous force replacing humans indiscriminately; rather, its labour consequences are socially conditioned by educational access, workplace governance, and policy response. This theoretical position also explains why the same technology may produce divergent outcomes across contexts. In highly adaptive organisational environments, AI complements labour and generates upgraded occupational roles, whereas in poorly prepared systems it intensifies exclusion and insecurity. From the standpoint of industrial sociological analysis, the theory therefore substantiates the paper's central conclusion that artificial intelligence is restructuring rather than replacing human labour, with its long-term implications dependent on how social institutions organise technological transition.

7. CONCLUSIONS

This paper concludes that artificial intelligence is not positioned to replace human labour entirely, but is actively transforming the structure, organisation, and social relations of work across contemporary economies. The analysis has shown that AI is reshaping employment by automating routine cognitive and operational tasks while generating demand for advanced technical, analytical, and adaptive competencies. Across sectors such as finance, manufacturing, healthcare, education, and digital services, occupational roles are being redefined rather than erased, confirming that the future of work lies in human-machine complementarity rather than absolute technological substitution. The findings further reveal that the implications of AI for job security and workplace relations depend largely on organisational implementation patterns. Where AI is introduced as a collaborative support system, it enhances productivity and professional efficiency; where it is deployed primarily for labour substitution and algorithmic control, it intensifies insecurity, weakens worker autonomy, and deepens workplace inequalities. Within the Nigerian context, the study established that while AI presents substantial opportunities for productivity growth, digital innovation, and occupational modernisation, weak educational adaptation, inadequate digital infrastructure, and institutional unpreparedness may limit inclusive participation in this transition.

8. RECOMMENDATIONS

1. Curriculum restructuring should be prioritised across Nigerian tertiary institutions through the integration of artificial intelligence literacy, computational thinking, data analytics, and digital problem-solving into both technical and non-technical disciplines. This will ensure that graduates possess the competencies required for participation in AI-driven workplaces and reduce the widening gap between educational output and labour market expectations.
2. Organisations adopting artificial intelligence should implement structured workforce reskilling and continuous professional development programmes for employees before and during technological integration. Such interventions should focus on digital adaptability, ethical AI use, and collaborative human-machine task coordination in order to reduce job insecurity and strengthen productive workplace relations.
3. The Federal Government of Nigeria should establish a national regulatory and labour transition framework for artificial intelligence adoption that protects workers from exploitative algorithmic management while encouraging responsible innovation. This framework should include labour protection guidelines, incentives for human-centred AI deployment, and institutional partnerships between industry, academia, and policy agencies to support equitable technological transition within Nigeria's labour market.

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