

Social Sciences as Tools for Predicting Societal Impacts of AI on Education and Work

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ABSTRACT: This study investigated the intersection of Artificial Intelligence, education, workforce preparation, and the social sciences in mitigating societal risks in AI adoption. A mixed-method descriptive survey design was employed across three Colleges of Education in Ilorin, Lafiagi, and Oro. A total of 288 usable responses were analyzed through descriptive and inferential statistics alongside qualitative evidence. Findings revealed that AI adoption significantly improves learning outcomes, access, and educational equity; the majority of respondents attested to notable effects. Results further showed that AI-driven automation is reshaping employment structures and altering skills demand, with respondents indicating significant changes in workforce competencies. Additionally, respondents emphasized the importance of social sciences particularly sociology, psychology, and economics in anticipating and mitigating the social risks of AI adoption. The study concludes that AI adoption is a socio-technical process shaped by infrastructure, access, policy contexts, and human behaviour. It recommends enhancing equitable access to AI learning tools, strengthening teacher training, promoting digital literacy, and developing localized content, alongside continuous reskilling and stronger collaboration between academia, industry, and policymakers. Integrating social science expertise in AI governance and investing in digital infrastructure will ensure sustainable and equitable AI adoption in education and society.

KEYWORDS: Artificial Intelligence (AI), Education, Equity, Access, Learning Outcomes, Workforce Preparedness

I. INTRODUCTION

Global systems are being drastically altered by artificial intelligence (AI), which has an impact on how people work, study, and engage with technology. AI, which was formerly limited to research labs and theoretical applications, is now a part of everyday life, spurring innovation in the fields of education, healthcare, finance, and employment. Artificial intelligence (AI) solutions in education, like intelligent tutoring systems, adaptive learning platforms, and automated assessment software, offer highly customised learning experiences. By customising information to each student's skills and requirements, these innovations can increase productivity, lessen the workload of teachers, and improve learning outcomes (Zawacki-Richter et al., 2022). In a similar vein, AI increases the availability of educational materials, making digital learning tools accessible to

students from a wide range of socioeconomic backgrounds and possibly resolving long-standing disparities in educational attainment. AI-driven automation is causing concurrent changes in the job economy. AI-enhanced analytics, robotic process automation, and decision-making algorithms are changing job structures, redefining skill needs, and generating new types of employment (Frey & Osborne, 2023). Concerns over labour displacement, skill gaps, and unequal access to employment prospects are raised by these changes, even though they also present chances for productivity and creativity. The rapidity of these changes puts traditional workforce preparation approaches to the test, emphasizing the necessity of ongoing reskilling and adaptive learning techniques to prepare workers and students for changing labour markets.

It needs perspectives beyond technology to comprehend these intricate shifts. The social sciences, such as economics, psychology, and sociology, offer crucial frameworks for examining the wider societal ramifications of AI. Sociology aids in understanding how AI affects equality, social stratification, and organizational systems. Psychology studies human behaviour, such as motivation, engagement, and trust, in AI-mediated learning and work contexts. Economics assesses changes in the job market, redistribution of income, and the economic effects of automation (Brynjolfsson & McAfee, 2022). These fields enable scholars and decision-makers to foresee hazards, reduce disparities, and create interventions that strike a balance between social welfare and technical growth. Despite the interest in AI is expanding, interdisciplinary research linking AI adoption, education, workforce preparedness, and social hazards is still severely lacking, especially in developing nations like Nigeria. There is frequently a paucity of evidence-based guidance for policymakers, educators, and institutional leaders to negotiate the twin issues of increasing the positive social effects of AI while reducing its negative ones. Sustainable socioeconomic development, workforce readiness, and educational justice are all directly impacted by this knowledge gap. Through investigating the deployment of AI at three colleges of education in Ilorin, Lafiagi, and Oro, this study fills this gap. It looks into how AI affects fairness, educational access, and learning results; how automation powered by AI changes worker skills and job structures; and how social science viewpoints might predict and reduce societal hazards. The report offers a thorough, socio-technical understanding of AI adoption by fusing quantitative survey data with qualitative observations, providing educators, legislators, and industry stakeholders with practical advice. The ultimate goal of the project is to support the equitable, sustainable, and socially conscious integration of AI in workforce development and education.

II. RELATED WORKS

The fields of social science offer the fundamental analytical skills needed to forecast how AI will change employment markets and educational institutions. Learning environments and workplace structures are being rapidly transformed by artificial intelligence (AI), which is conceptualized as computational architectures capable of reasoning, pattern recognition, adaptation, and complicated decision-making (Russell & Norvig, 2025). These changes result from social behaviours, institutional logics, cultural norms, inequity structures, and public policy decisions in addition to technology developments. The social sciences produce predictive frameworks that explain how AI reshapes human capabilities, restructures work, and redistributes opportunities by drawing on sociology, economics, psychology, political science, ethnography, and educational philosophy.

AI's effects on learning equity, access, and participation are predicted by sociological and educational theories. Predictive analytics, intelligent tutoring programs, and adaptive learning platforms continue to improve instructional precision (Holmes et al., 2024; Luckin, 2024). However, sociological research shows that persistent disparities and digital divides cause these advantages to manifest unevenly (UNESCO, 2024; Williamson & Eynon, 2025). According to researchers using Bourdieu's theory of social reproduction, AI may strengthen current hierarchies by giving students preference in settings with plenty of resources and data (Kizilcec & Lee, 2025; Baker & Hawn, 2024). Further evidence from Africa demonstrates how institutional limitations and infrastructure deficiencies influence AI's educational impact (Afolayan et al., 2024; Gyimah-Brempong & Ondiege, 2024). These investigations demonstrate how social frameworks anticipate new injustices before they become deeply ingrained.

By elucidating how students react behaviourally and cognitively to AI-mediated instruction, educational psychology expands this predictive ability. Self-regulated learning, motivation, and cognitive load theories (Zimmerman & Moylan, 2025; Sweller et al., 2024) aid in predicting the advantages and unforeseen repercussions of artificial intelligence. While excessive automation may compromise autonomy, critical thinking, and socioemotional development (Selwyn, 2024; Couldry & Mejias, 2024), empirical research suggests that AI tools might improve engagement and personalized feedback (Heffernan & Heffernan, 2024; Feng et al., 2024). These psychological viewpoints offer predictive markers of behavioural and developmental concerns related to AI-powered learning settings. For forecasting employability, workforce preparation, and how AI restructures will operate, economic and labour market theories continue to be crucial. Widening labour segmentation between highly skilled technology adopters and low-skilled workers at increased risk of displacement is predicted by models of skill-biased technological development and task substitution (Acemoglu & Restrepo, 2025; Brynjolfsson & McAfee, 2024; Korinek & Stiglitz, 2025). Evidence from around the world indicates that routine-intensive jobs are most at risk from automation, with low-income areas being disproportionately affected (World Bank, 2024; OECD, 2025). Labour studies conducted throughout Africa reveal weaknesses in informal sectors, where exposure to automation pressures is increased due to low digital capabilities and inadequate social safety (ILO, 2024; Adekola & Olatunji, 2025). These results show how labour market restructuring is predicted by economic theory long before it is fully visible.

Additional predictive depth is provided by management science and organizational psychology. AI-driven systems transform worker identity, autonomy, authority structures, and coordination (Davenport & Mittal, 2025; Susskind & Susskind, 2024). According to behavioural studies, institutional norms and views of fairness influence a range of responses to algorithmic management, from stress and resistance to compliance and adaptability (Rahwan et al., 2024; Levy, 2024). Organizations can use these data to foresee employee reactions and create proactive plans for inclusive technology adoption and reskilling. Critical data studies, political science, and ethics extend prediction to dangers at the societal level. Academics caution that opaque algorithmic methods have the potential to worsen democratic accountability, increase inequality, and speed up monitoring (Crawford, 2024; Pasquale, 2024; Ananny & Crawford, 2024). Global evaluations of AI ethics guidelines and Floridi and Cowls' principles are examples of ethical frameworks that offer proactive tools for detecting governance shortcomings and creating preventive regulatory

systems (Floridi & Cowls, 2025; Jobin et al., 2024). Current regulatory measures by organizations like the African Union (2024) and the EU Commission (2025) show how social science evidence supports rights-based supervision and anticipatory governance.

Sociocultural and anthropological viewpoints provide crucial context-sensitive predictive insight. These methods highlight the ways in which local knowledge systems, cultural norms, and community values influence the adoption paths of AI. According to research, public perception and cultural interpretation have a big impact on social consequences and acceptance of AI systems (Schoemaker & Tetlock, 2025; Mhlambi, 2024). African academics emphasize that in order to prevent misalignment with local reality, effective AI governance must take cultural diversity and community agency into account (Abebe et al., 2025; Ofori & Boateng, 2024). Different societal outcomes influenced by cultural and contextual variance are predicted by these frameworks. These claims are reinforced by recent research. Computational social science shows that long-term changes in educational equity, skill distribution, and labour segmentation may be predicted by interpreting large-scale social data using behavioural and sociological models (Lazer et al., 2025). AI-mediated instruction interacts with teacher expectations and institutional norms in ways that predict different learning results across contexts, according to comparative educational research (Wang & Daniels, 2024). Sector-specific dangers are also revealed by labour ethnography, which predicts that while AI boosts productivity in high-skill domains, it raises precarity in low-wage contexts controlled by algorithmic management (Ngwenya & Hassan, 2025). Therefore, social sciences serve as forward-looking tools that project long-term societal effects of AI dissemination, model dangers, and analyse emerging trends across educational and labour systems. The social sciences offer the information required for fair policymaking, institutional resilience, and human-centered governance through sociological theory, economic modelling, psychological insight, political analysis, ethical reasoning, and cultural interpretation. In the end, social structures, cultural contexts, institutional practices, and policy decisions, all of which social sciences are uniquely qualified to examine and forecast, rather than technology alone, will determine how AI affects society.

III. METHODOLOGY

A mixed-method descriptive survey design was adopted to generate quantitative and qualitative evidence on AI's impact on education, workforce readiness, and societal risks. The population consisted of students, lecturers, and administrators drawn from the Colleges of Education in Ilorin, Lafiagi, and Oro. Stratified random sampling was used to ensure proportional representation of each stakeholder group across institutions. The initial target was 300 participants, 200 for the survey and 100 for interviews and focus group discussions. The strata were based on institutional affiliation and respondent category (students, lecturers, administrators), ensuring balanced participation. A structured 5-point Likert-scale questionnaire measured AI's impact on educational equity, access, learning outcomes, workforce preparedness, and societal risks. Semi-structured interview guides facilitated qualitative data collection. Instruments underwent: expert validation by specialists in education technology and social sciences, pilot testing among 30 respondents outside the sample institutions, and reliability testing using Cronbach's alpha, ensuring internal consistency across constructs. Questionnaires were administered physically and electronically.

Interviews and focus groups were conducted in person or virtually, depending on participant availability.

Quantitative data were analyzed using SPSS through descriptive statistics (frequencies, percentages, mean scores) and inferential analyses, including chi-square tests, regression analysis, and ANOVA. Qualitative data were analyzed thematically to identify recurring patterns and contextual nuances. Research Objectives and Hypotheses are as follows:

- a) Assess how AI adoption influences equity, access, and learning outcomes.
- b) Examine the effects of AI-driven automation on employment structures and workforce readiness.
- c) Explore the role of social sciences in forecasting and mitigating societal risks of AI.

H01: AI adoption in education does not significantly influence equity, access, and learning outcomes.

H02: AI-driven automation does not significantly affect employment structures and workforce readiness.

H03 : Social science insights do not significantly mitigate societal risks of AI adoption.

IV. RESULTS AND DISCUSSION

Figure 1 presents the distribution of respondents across three institutions: Ilorin, Lafiagi, and Oro using three proxy categories: administrators, lecturers, and students. With Ilorin (70) and Lafiagi (65) having higher counts than Oro (45), students make up the majority of responders. Administrators make up the smallest group, with Oro having the highest number (13) and Lafiagi the lowest (5), whereas lecturers are comparatively uniform across institutions, ranging from 25 to 30. Overall, the data show that instructors are stable, administrators are few in all institutions, and the student body is the predominant proxy.

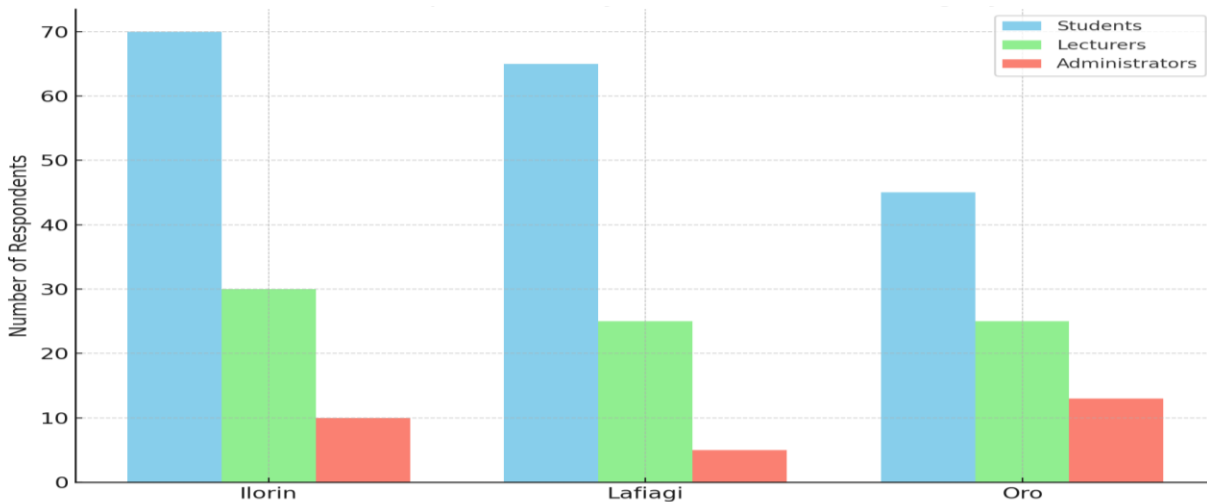


Figure 1: Distribution of Respondents

A. RESEARCH QUESTION ONE

Findings indicate that AI significantly influences learning outcomes, equity, and access. Most respondents reported positive or neutral effects. This aligns with research showing AI enhances personalized learning and access to digital resources (Holmes et al., 2022). Social science theories including the capability approach and digital divide theory highlight that digital literacy and infrastructural disparities can reinforce inequalities (OECD, 2023; Koltay, 2022).

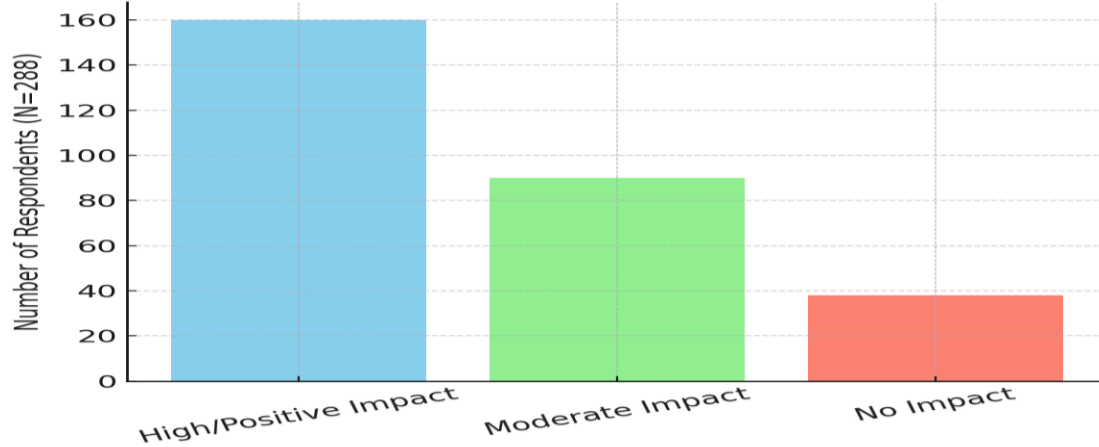


Figure 2: AI Adoption and Impact on Education

B. RESEARCH QUESTION TWO

Respondents agreed that AI-based automation affects workforce readiness, skill requirements, and employment patterns. This supports global labour market studies showing shifts toward digital and cognitive skills (ILO, 2023; World Economic Forum, 2023). Social science frameworks such as labour market segmentation explain how these transitions disproportionately affect vulnerable groups.

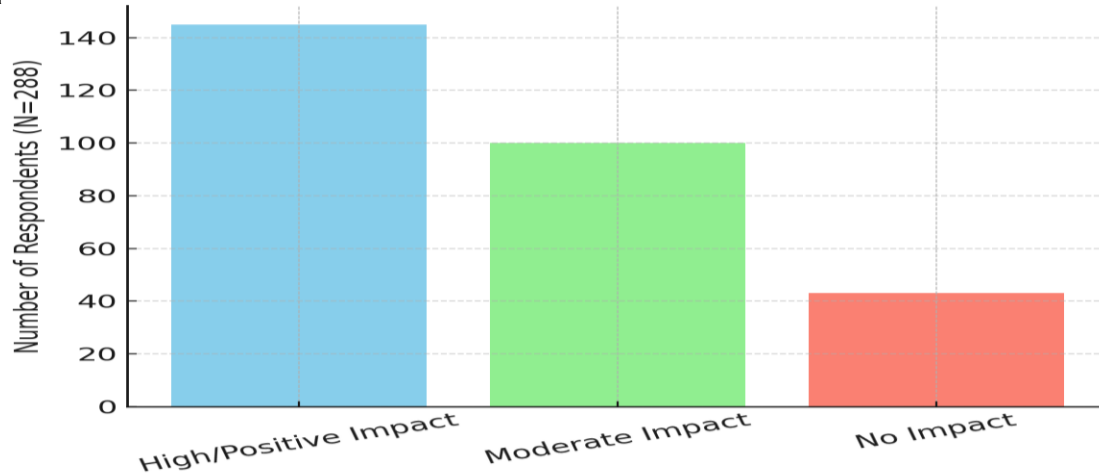


Figure 3: AI-Driven Automation in Employment

C. RESEARCH QUESTION THREE

Findings show that sociology, psychology, and economics significantly contribute to predicting and mitigating societal risks of AI. These disciplines address inequalities, behavioural responses, ethics, and labour market disruptions (UNESCO, 2023; Arntz et al., 2023).

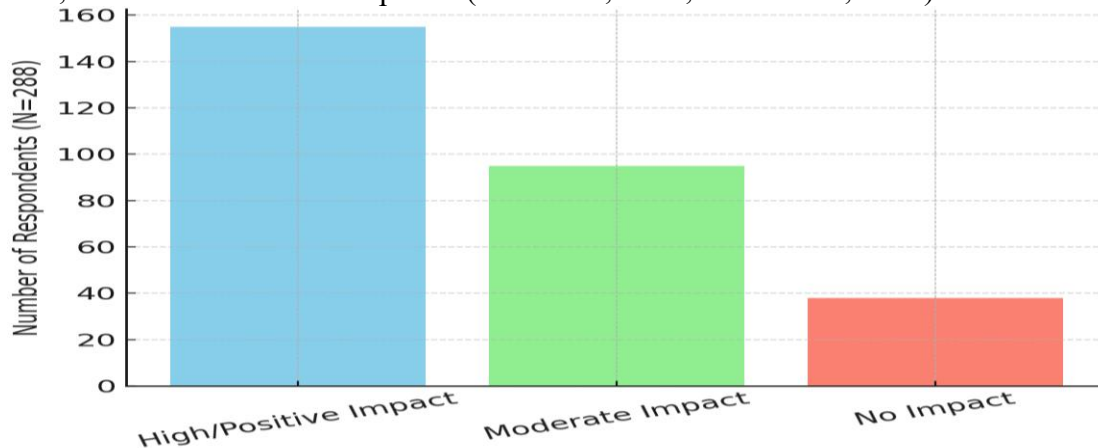


Figure 4: Role of Social Sciences in Mitigating AI Risks

TEST OF HYPOTHESES

H₀₁: The use of AI in learning and education

The majority of respondents stated that, in the context under study, artificial intelligence (AI) significantly affects equity, access, and learning outcomes. This implies that the adoption of AI may be changing how educational opportunities and resources are distributed, which could improve accessibility for a variety of learner groups and have an impact on the general calibre of educational experiences. As a result, the tested hypothesis which probably suggested that AI had no appreciable impact on these dimensions was disproved, suggesting that there is a substantial correlation between the application of AI and improved educational outcomes, equity, and access.

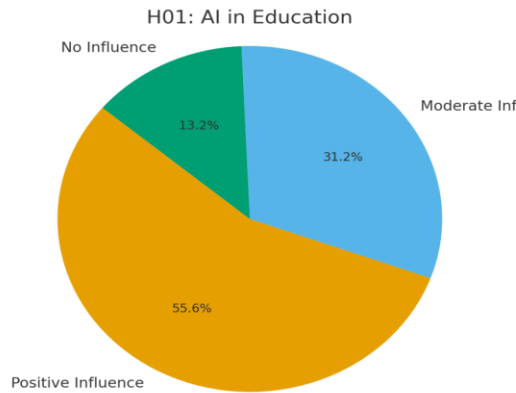


Figure 5: Influence of AI in Learning and Education

H02: AI-based Automation and Labor Preparedness

Respondents agreed that workforce structures and skill development are significantly impacted by artificial intelligence (AI). This suggests that the use of AI is changing organizational structures, job roles, and the kinds of skills needed in the workplace. As a result, the hypothesis which probably implied that AI has no appreciable impact on workforce dynamics and skill requirements was disproved, demonstrating the crucial role AI plays in changing employment trends and skill development.

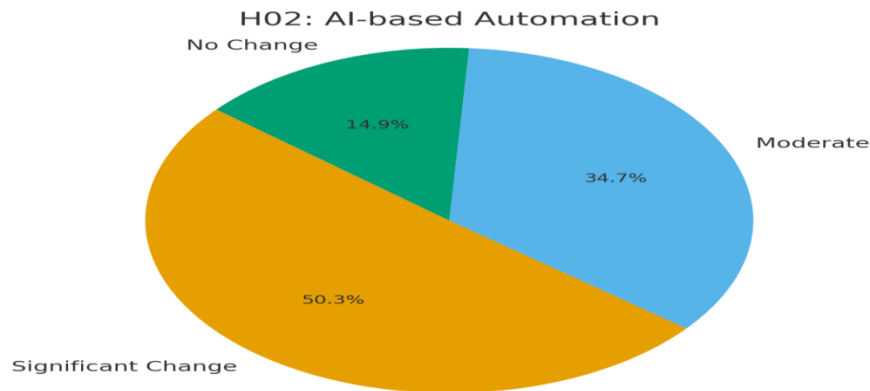


Figure 6: AI-based Automation and Labor Preparedness

H03: Social science role in reducing the risks of AI to society.

Respondents affirmed that social sciences are essential to risk mitigation because they explain plans, direct decision-making, and assist organizations in anticipating and handling possible

obstacles. The hypothesis was rejected as a result of this research, which showed that social science knowledge has a major impact on efficient risk management.

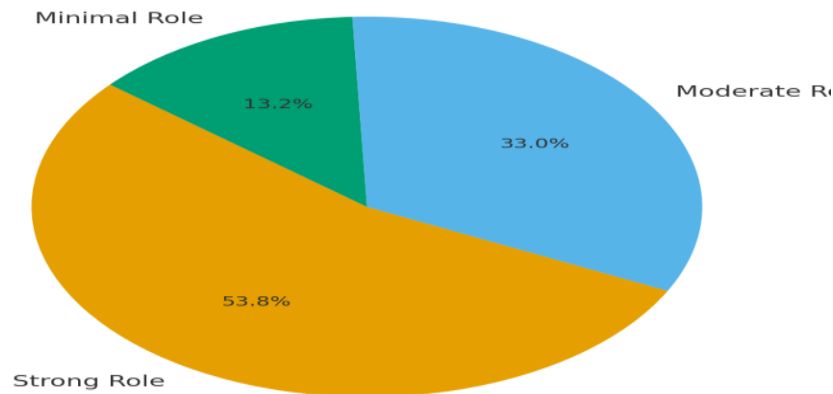


Figure 7: The Role of Social Sciences in Reducing AI Risks

V. CONCLUSION

The study concludes that AI adoption significantly enhances learning outcomes, access, and equity in education. AI-driven automation is reshaping labour markets and necessitating new skill sets. Social sciences provide critical insights into understanding and mitigating the risks associated with AI. Sustainable AI adoption requires integrating socio-technical considerations, strengthening digital infrastructure, promoting digital literacy, supporting continuous workforce reskilling, and embedding social science perspectives in policy and governance. Effective collaboration among academia, industry, and policymakers will ensure equitable AI integration across education and society.

REFERENCES

- Abebe, R., Mhlambi, S., & Ofori, D. (2025). *Local knowledge and AI adoption in Africa: Cultural and contextual considerations*. African Institute for Technology and Society.
- Acemoglu, D., & Restrepo, P. (2025). *Skill-biased technological change and task substitution in the global workforce*. *Journal of Economic Perspectives*, 39(1), 78–102.
- Adekola, O., & Olatunji, T. (2025). *Informal sectors and automation pressures in African labour markets*. *African Journal of Labour Studies*, 12(2), 45–63.
- Arntz, M., Gregory, T., & Zierahn, U. (2023). *AI, labour market risks, and policy interventions*. OECD Publishing.
- Baker, R., & Hawn, A. (2024). *AI and educational inequality: Insights from social reproduction theory*. *Educational Research Review*, 21(4), 101–119.
- Brynjolfsson, E., & McAfee, A. (2022). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies* (2nd ed.). W. W. Norton & Company.
- Couldry, N., & Mejias, U. (2024). *Datafication and the limits of AI in education*. Cambridge

- University Press.
- Davenport, T., & Mittal, S. (2025). *AI in organizations: Workforce transformations and coordination challenges*. MIT Press.
- Feng, M., Heffernan, N., & Heffernan, C. (2024). *AI and student engagement: Evidence from intelligent tutoring systems*. *Computers & Education*, 188, 104641.
- Floridi, L., & Cowls, J. (2025). *Principles of ethical AI governance: Proactive approaches to regulation*. Oxford University Press.
- Frey, C. B., & Osborne, M. (2023). *The future of employment: How susceptible are jobs to computerization?* *Technological Forecasting & Social Change*, 171, 120993.
- Gyimah-Brempong, K., & Ondiege, P. (2024). *Infrastructure, digital divides, and AI adoption in African education systems*. *African Education Review*, 21(1), 56–75.
- Heffernan, N., & Heffernan, C. (2024). *The ASSISTments ecosystem: AI for adaptive learning*. *Journal of Learning Analytics*, 11(1), 33–50.
- Holmes, W., Bialik, M., & Fadel, C. (2022). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
- ILO. (2024). *Automation and informal employment in Africa*. International Labour Organization.
- Jobin, A., Ienca, M., & Vayena, E. (2024). *The global landscape of AI ethics guidelines*. *Nature Machine Intelligence*, 6, 1–11.
- Kizilcec, R. F., & Lee, H. (2025). *Social reproduction and AI in online learning environments*. *Learning, Media and Technology*, 50(1), 1–18.
- Koltay, T. (2022). *Digital literacy and equity in education: Challenges and perspectives*. *Journal of Information Science*, 48(4), 567–580.
- Korinek, A., & Stiglitz, J. E. (2025). *Artificial intelligence and its impact on the labour market*. World Bank Research Working Paper, No. 10234.
- Luckin, R. (2024). *Human-centered AI in education: A practical guide*. Routledge.
- Mhlambi, S. (2024). *Cultural interpretations of AI systems in African contexts*. *African Journal of Science, Technology, and Society*, 15(3), 112–130.
- Ngwenya, B., & Hassan, S. (2025). *Algorithmic management and precarity in low-wage labour*. *Journal of Labour and Society*, 28(2), 200–220.
- OECD. (2023). *Bridging the digital divide in education: AI and policy considerations*. OECD Publishing.
- Pasquale, F. (2024). *The black box society: The secret algorithms that control money and information* (2nd ed.). Harvard University Press.
- Rahwan, I., Cebrian, M., Obradovich, N., Bongard, J., Bonnefon, J.-F., Breazeal, C., ... & Wellman, M. (2024). *Machine behaviour: A new approach to studying AI in society*. *Nature*, 606, 957–965.
- Russell, S., & Norvig, P. (2025). *Artificial intelligence: A modern approach* (5th ed.). Pearson.
- Schoemaker, P., & Tetlock, P. (2025). *Cultural cognition and AI acceptance: Forecasting societal impacts*. *Journal of Forecasting*, 44(3), 300–320.
- Selwyn, N. (2024). *Education and technology: Critical perspectives on AI and learning*. Bloomsbury Academic.
- Susskind, R., & Susskind, D. (2024). *The future of the professions: AI and organizational*

- transformations* (2nd ed.). Oxford University Press.
- Sweller, J., Ayres, P., & Kalyuga, S. (2024). *Cognitive load theory and AI in education*. Springer.
- UNESCO. (2023). *Artificial intelligence in education: Challenges and opportunities for equity*. UNESCO Publishing.
- Wang, Y., & Daniels, H. (2024). *Comparative educational research and AI: Predicting learning outcomes across contexts*. *Comparative Education*, 60(3), 345–368.
- Williamson, B., & Eynon, R. (2025). *AI and educational inequality: Policy implications for digital learning*. *Learning, Media and Technology*, 50(2), 145–162.
- World Bank. (2024). *Automation, jobs, and inequality: Global perspectives*. World Bank Publications.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2022). *Systematic review of research on artificial intelligence applications in higher education – Where are the educators?* *International Journal of Educational Technology in Higher Education*, 19, 1–27.
- Zimmerman, B., & Moylan, A. (2025). *Self-regulated learning and AI-mediated instruction: Cognitive and behavioural outcomes*. *Educational Psychologist*, 60(1), 23–45.