INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH AND INNOVATIVE STUDIES
ISSN: 2820-7157
www.ijsrisjournal.com

April 2026 **Volume 5** **Number 2** **50-57**

Received Date: 22 February 2026 **Accepted Date: 14 March 2026** **Published Date: 2 April 2026**

Artificial Intelligence and Entrepreneurship in Africa

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Abstract

This study examines the complex relationship between the integration of artificial intelligence (AI), the education system, and the entrepreneurial intentions of young graduates in Africa, with a particular focus on the Malian context (a multidimensional economic analysis).

In an environment characterised by strong demographic pressure and a labour market dominated by informality, the ability of African economies to convert educational investments into real economic value is a major challenge. Drawing on human capital theory and Lazear's "balanced skills" model, the article analyses how AI redefines the returns to education and reshapes professional trade-offs. Using econometric modelling via multinomial logistic regression and analysing recent data from the Global Entrepreneurship Monitor (2025/2026) and UNESCO, the results highlight the emergence of a dual gap: the "AI Readiness Gap" and the "Survival Gap".

The study shows that whilst AI offers opportunities for personalised learning and productivity gains, its effectiveness depends on the quality of digital infrastructure and the adaptation of pedagogical frameworks. The findings call for a transition from theoretical awareness to practical and technological support in order to transform the demographic dividend into a lever for inclusive growth.

Keywords: Artificial Intelligence, Human Capital, Education, Entrepreneurship, Africa.

1. Introduction

The intersection between the education system and entrepreneurial dynamics constitutes one of the fundamental pillars of contemporary economic thinking, particularly in developing economies such as Mali.[1] In a globalised context where innovation and organisational agility dictate growth, a country's ability to transform its educational investments into a force for value creation is paramount. For Africa, this issue is part of a demographic and social emergency: with nearly 60% of the population under the age of 25, matching training with employment is becoming the major challenge of the decade.[1]

The emergence of artificial intelligence (AI) further complicates this equation. Whilst sub-Saharan Africa must recruit 15 million teachers by 2030 to meet educational demand, AI presents itself both as a threat to traditional employment and as a historic opportunity for 'leapfrogging' in education systems.[3] The research question guiding this analysis is as follows: To what extent do the integration of artificial intelligence and the reform of the African education system influence the formation of human capital and the entrepreneurial intentions of graduates in the face of the constraints of a labour market dominated by informality?

This question raises a multidimensional issue. On the one hand, classical human capital theory posits that education increases productivity and the capacity for entrepreneurship.[1] On the other hand, empirical evidence reveals a persistent paradox: high unemployment among graduates (24% for higher education graduates in Mali) and a drift towards subsistence-based informal work rather than growth-oriented entrepreneurship.[1] The introduction of AI could either exacerbate these disparities via the 'AI Readiness Gap', or provide tools for personalised learning capable of strengthening learners' self-efficacy.[6]

The central issue addressed in this report is the observed mismatch between students' career aspirations and the actual opportunities offered by the formal private sector, which accounts for only 2% to 3.8% of employment in some countries.[1] The analysis will seek to demonstrate that entrepreneurship education in Africa must now incorporate a sovereign technological dimension to prevent the premature obsolescence of human capital.[8]

2. Theoretical framework and the evolution of the concept of human capital

The economic analysis of education is based on human capital theory, formalised by, Theodore Schultz and Gary Becker in the 1960s. According to Schultz, investment in knowledge and skills is a key determinant of economic growth, on a par with physical capital.[1] Becker expanded on this analysis by distinguishing between general (transferable) human capital and specific (firm-specific) human capital, positing that individuals invest rationally in their education to maximise their future earnings.[1]

2.1. Mincer's model and learning by doing

Jacob Mincer (1974) expanded this framework by introducing work experience as a factor in the accumulation of human capital. In the African context, this distinction is crucial, as the accumulation of skills does not stop at formal schooling but continues in the workplace, often in the informal sector.[1] The Mincer earnings function is generally expressed by the following equation:

$$\ln(w) = \ln(w_0) + \rho S + \beta_1 X + \beta_2 X^2 + \epsilon$$

Where w is the wage, S is years of schooling, and X is experience. The advent of AI alters the value of S by demanding new digital skills, and potentially accelerates X through virtual simulations and intelligent tutoring.[6]

2.2. Lazear's theory of balanced skills (Jack-of-all-trades)

A major theoretical contribution to understanding entrepreneurship is Edward Lazear's 'Balanced Skills' theory (2004). Unlike an employee who maximises their income by specialising, an entrepreneur must be competent across a wide range of fields (finance, marketing, management, technical).[1] Mathematically, an entrepreneur's income is limited by their weakest skill:

$$Income = \lambda \min(x_1, x_2, \ldots, x_n)$$

AI acts here as a powerful catalyst: it enables the entrepreneur to compensate for their weaknesses in certain technical areas (such as accounting or drafting business plans) through automation, whilst requiring greater expertise in judgement and strategic decision-making.[12]

Beyond economic rationality, Albert Bandura's social learning theory highlights the role of self-efficacy. An individual's belief in their ability to perform complex tasks is a key driver of entrepreneurial intent.[1] By providing immediate feedback and personalised support, AI can reinforce this sense of control in the student.[6] This perspective is complemented by Ajzen's Theory of Planned Behaviour (TPB), which identifies attitude, subjective norms and perceived control as the three pillars of the intention to start a business.[1]

3. Context

The African economy in 2025 is marked by a striking duality. On the one hand, resilient growth and an explosion of tech start-ups; on the other, persistent infrastructure deficits. Mali, for example, saw its growth rise from 3.5% in 2022 to 4.7% in 2023, but income poverty still affects 42% of the population.[1]

3.1. Infrastructure as a barrier to AI

The integration of AI into education is hampered by fundamental inequalities in access. Whilst broadband penetration exceeds 80% in OECD countries, it remains below 30% in many regions of sub-Saharan Africa.[14]

Indicator	Value in Africa	Global/OECD benchmark	Source
Broadband penetration	< 30%	> 80%	[14]
Access to electricity (rural)	Critical limiting factor	-	[1]
E-Government Development Index (EGDI)	0.4247	0.6382 (Global)	[15]
Share of global AI talent	3%	-	[16]
Literacy rate (Mali)	26.2%	-	[1]

The withdrawal of international donors (a 12% drop in aid for education in 2024) is exacerbating the situation, leaving 272 million children out of the school system, half of whom are on the African continent.[17]

3.2. The demographic dividend and the learning crisis

Africa has the world's youngest population, with 60% of people under 25 .[2] However, 25% of 15–24-year-olds are neither in employment nor in education or training (NEET).[4] There is a glaring shortage of qualified teachers: 15 million posts need to be created by 2030.[3] In this educational vacuum, AI is seen not as a luxury, but as a strategic necessity to extend the reach of existing teachers.[3]

3.3. Analysis of the 'Gaps'

The 2025/2026 "Global Entrepreneurship Monitor" (GEM) report identifies two new gaps that threaten Africa's economic sustainability: the "Survival Gap" and the "AI Readiness Gap".[7]

❖ The AI Readiness Gap

This concept refers to the growing divide between entrepreneurs with access to AI and those who are excluded from it. The gap in AI readiness scores between North America (81.51) and sub-Saharan Africa (29.12) highlights a pressing policy need.[15] Without investment in AI literacy and sovereign computing capacity, the African entrepreneurial economy risks becoming a two-speed economy.[18]

Region	Government AI Readiness Score (Average)	Source
North America	81.51	[15]
Europe	84.93 (EGDI)	[15]
Sub-Saharan Africa	29.12	[15]
Global Average (EGDI)	0.6382	[15]

By 2025, countries such as Nigeria (70th globally) and Tanzania had made significant progress, but the majority of African states had not yet published a national AI strategy, thereby limiting the mobilisation of resources.[19]

❖ The Survival Gap

The GEM warns that many start-ups fail to survive beyond the 3.5-year mark to become established businesses.[7] This gap is directly linked to weaknesses in the enabling environment, particularly entrepreneurial education in schools and access to finance.[7] In Mali, 89% of businesses remain family-run and 97% lack internal auditing, which limits their capacity for expansion and their attractiveness to investors.[1]

❖ Continental Strategy and Governance of AI

In July 2024, the African Union adopted the Continental Strategy on Artificial Intelligence.[16] This landmark document aims to position Africa not as a passive consumer, but as an active contributor to technological development.

❖ **AU Objectives and Principles**

The strategy sets the ambitious target of contributing $1.5 trillion to the African economy by 2030.[16] It is based on five areas of focus:

- ✓ Harnessing the benefits of AI for priority sectors (health, agriculture, education).
- ✓ Strengthening human and technical capacity.
- ✓ Minimising ethical and security risks.
- ✓ Stimulating public and private investment.
- ✓ Promoting regional cooperation for data sovereignty.[21]

Analysis of the initial implementation phase (July 2024 – October 2025) shows, however, a high degree of geographical concentration, with 83% of funding going to just four countries.[16] Furthermore, data sovereignty remains a challenge: less than 0.02% of internet content is available in African languages, and only 2.8% of computer vision algorithms are adapted to the continent's contexts.[16]

❖ **Towards an appropriate regulatory framework**

The AU is encouraging member states to harmonise their data protection and cybersecurity laws with the Malabo Convention.[21] The challenge is to create sophisticated governance mechanisms (national AI councils, regulatory sandboxes) whilst addressing fundamental infrastructure gaps. This tension is described as the 'development-governance paradox'.[16]

4. Methodology

To understand the determinants of entrepreneurial intention and the impact of education, this study employs multinomial logistic regression modelling, applied to data collected from 567 students at the FSEG in Bamako.[1]

4.1. Model specification

An individual's choice of a career path j is modelled by the probability:

$$P(Y_i = j) = \frac{e^{\beta_j X_i}}{1 + \sum_{k=1}^{J} e^{\beta_k X_i}}$$

In this study, Y comprises three categories:

- ➢ Business start-up (Reference category).
- ➢ Salaried employment (private sector/NGO).
- ➢ Civil service.

The explanatory variables X include cognitive factors (attitude, self-efficacy), educational factors (field of study, entrepreneurship training), socio-demographic factors (gender, age) and contextual factors (family background).[1]

4.2. Results

The estimates reveal key insights into the paradoxes of the Malian education system.

Variable	Odds Ratio (OR) – Private vs. Entrepreneurship	Odds Ratio (OR) - Public School vs. Entrepreneurship	Significance
Gender (Female)	3.46	2.96	Women are shying away from entrepreneurship
Finance sector	5.24	-	Attraction to skilled salaried employment
EE awareness	-	2.14	Deterrent effect of theoretical lessons
Positive attitude	0.42	0.40	Attitude reduces the probability of choosing salaried employment

Note: An OR > 1 relative to the reference (Entrepreneurship) means that the variable increases the probability of choosing salaried employment.

Analysis of the results shows that current education can, paradoxically, act as a barrier. Awareness of entrepreneurship, when purely theoretical, appears to increase the perception of financial and administrative risks, pushing students towards the security of the civil service (OR = 2.14).[1] Furthermore, the gender bias is significant: being a woman reduces the probability of starting a business by 21.7 percentage points, illustrating the internalisation of social barriers and risk aversion.[1]

4.3. Mediation analysis and structural equation modelling

Other studies in Africa (notably in Morocco) use structural equation modelling (SEM) to demonstrate that pre-existing digital skills account for 34% of the effect of training on the actual use of technological tools.[13] This confirms that the introduction of AI in education cannot succeed without a solid foundation in digital literacy.

4.4. AI and the future of learning in Africa

The integration of AI by 2025 is radically transforming the educational landscape. It offers systems capable of analysing, adapting and personalising teaching to the specific needs of each learner.[6]

❖ EdTech Innovation Models

Several initiatives illustrate the potential of AI to overcome local constraints:

- Luma Learn (South Africa/Nigeria): An AI tutor operating on WhatsApp, utilising low bandwidth and local languages (IsiZulu, Swahili) to teach complex concepts such as algebra or physics.[3]

- Kwathu Farms (Malawi): A simulator using AI to teach young people about agricultural risk management and market planning before investing real capital.[3]

- RobotsMali (Mali): Uses AI to translate and adapt culturally relevant storybooks into national languages at low cost, promoting literacy in rural areas.[23]

❖ AI and the professionalisation of teaching

AI is redefining the role of teachers by automating administrative tasks and marking, thereby allowing them to focus on educational support.[6] An empirical study in the Fez-Meknes region shows that the perceived usefulness of AI ($\beta = 0,42$) and institutional support ($\beta = 0,38$) are the main drivers of technology adoption among teachers.[13] However, a lack of equipment remains the main obstacle for 51% of teachers in rural areas.[13]

❖ AI and Entrepreneurship: Opportunities and Risks of Substitution

AI is changing the profile of entrepreneurs. According to research findings from 2025, exposure to AI is shifting the profile of founders: from young generalists to experienced specialists.[12]

❖ Substitution vs Complementarity of Skills

AI excels at routine cognitive tasks (prediction, classification), which may replace the repetitive experience once valued in generalist entrepreneurs.[12] Conversely, it complements skills based on judgement, creativity and deep sector-specific expertise.

Type of experience	Impact of AI	Effect on entrepreneurship	Source
Repetitive experience	Substitution	Loss of relative value	12
Research/Analysis	Complementarity	Increased productivity	12
Judgement/Creativity	Complementarity	Essential for survival	12

5. Impact on decision-making

Generative AI (GenAI) helps entrepreneurs generate ideas, analyse vast amounts of market data and solve complex problems.[10] Experiments show that access to AI improves the performance of already competent entrepreneurs by more than 20%, but can undermine that of less successful entrepreneurs if they blindly follow imperfect recommendations.[24] This highlights the critical importance of training in technological discernment.

5.1. Ethical Challenges and Cultural Sovereignty

A major risk of AI in Africa is ‘cultural transfer’. By using AI tools trained on Western worldviews, African students risk neglecting their own indigenous knowledge systems and languages.[25]

5.2. Preserving Cultural Memory

AI must be rooted in local culture to ensure equity. UNESCO advocates for local control over AI to preserve ancestral knowledge and prevent algorithms from reinforcing historical racial or gender biases.[25] The integration of the General History of Africa into education systems and AI databases is an essential step in this reclaiming intellectual sovereignty.[17]

5.3. AI and the Labour Market: Risks of Displacement

In South Africa, the IMF estimates that 40% of the workforce (around 9.7 million jobs) is at risk from AI-related automation.[19] Manual and administrative workers are expressing strong resistance, fuelled by fears of unemployment and a lack of practical retraining programmes.[19] Conversely, 69% of employers are actively recruiting talent with AI skills, creating an imbalance between labour supply and demand.[19]

6. Discussions

The analysis demonstrates that education in Africa must break with the traditional academic model to embrace a hybrid and technological approach. The validation of hypotheses and lessons from the field, alongside classical theories (H1, H2, H3), confirms that attitude and self-efficacy remain the drivers of intention.[1] However, the Malian case illustrates the failure of purely theoretical awareness-raising (H5). As Bandura suggests, self-efficacy is not built through discourse but through the experience of mastery.[1] It is therefore imperative to transform curricula into AI-assisted incubators for action. AI as a tool to reduce the Survival Gap: to lower the mortality rate of African start-ups, AI can offer virtual mentoring services and world-class management tools at low cost. Estonia's "AI Leap" initiative, which weaves AI throughout the entire education system, could serve as a model for African countries wishing to become digital leaders.[20] Mali and other African nations must adopt "adaptive implementation trajectories" to resolve the development-governance paradox.[16] The systematic integration of AI**:** revising curricula to include AI not as an option, but as a cross-curricular tool from primary school onwards.[8] Replacing theoretical awareness modules with real-world incubation projects, using AI simulators to expose students to real-world scenarios without immediate financial risk.[1] Establish national AI skills programmes for educators, emphasising ethical and pedagogical dimensions (Intelligent-TPACK model).[6] In the entrepreneurial ecosystem, infrastructure and connectivity: Prioritise investment in rural broadband and sovereign data centres to bridge the AI Readiness Gap.[8] Access to Technology Capital: Strengthen funds such as FACEJ (Mali) or FAFE to specifically support start-ups using AI to solve sector-specific problems (agritech, healthcare).[1] And develop specific mentoring programmes for women to remove the psychological and social barriers identified in the econometric analysis.[1]

Africa must invest in its own datasets and language models to ensure that AI reflects its values (such as Ubuntu) and addresses its specific challenges.[25] Regional cooperation, driven by the AU's strategy, is the only way to achieve the critical mass needed to compete with global ecosystems.[21]

7. Conclusion

The analysis of education and AI in Africa in 2025 reveals a dynamic that is both perilous and rich in opportunities. Africa's human capital stands at a crossroads: either it faces obsolescence in the face of global automation, or it embraces AI to boost its productivity and creativity. The econometric study has highlighted the shortcomings of traditional teaching methods, whose deterrent effect on entrepreneurship must be addressed by a shift towards practical and technological action.

The "Survival Gap" and the "AI Readiness Gap" are not inevitable, but indicators of a necessary structural transformation. By aligning the educational reforms of PRODEC 2 (or national equivalents) with the AU's Continental Strategy, Africa can transform its demographic dividend into a sovereign economic force. AI-assisted entrepreneurship must become the driving force behind a resilient economy, capable of offering every graduate the means to contribute to national wealth. The future of education in Africa will depend on its ability to build an ecosystem where artificial intelligence enhances human intelligence, whilst remaining deeply rooted in the realities and values of the continent.

Bibliography

1. Redefining Capacity Building for Africa in the AI Era - ABNT.com, 2026, https://abnt.com/redefining-capacity-building-for-africa-in-the-ai-era/

2. Artificial Intelligence and the Future of Education and ..., https://africarenewal.un.org/fr/magazine/lintelligence-artificielle-et-lavenir-de-leducation-et-de-lapprentissage

3. Education in Africa | UNESCO, 2026, https://www.unesco.org/fr/africa/education

4. The importance of human capital in education | PDF - Scribd, https://fr.scribd.com/document/546274066/LA-THEORIE-DU-CAPITAL-HUMAIN-20218TCH

5. The impact of artificial intelligence on teaching and ...https://www.shs-conferences.org/articles/shsconf/pdf/2025/05/shsconf_cifem2024_01010.pdf

6. GEM 2025/2026 Global Report: From Uncertainty To Opportunity - GEM Global Entrepreneurship Monitor, https://gemconsortium.org/report/51858

7. Train Africa's teachers in AI – or risk an education crisis – MyJoyOnline, https://www.myjoyonline.com/train-africas-teachers-in-ai-or-risk-an-education-crisis/

8. Education and Economic Growth: A Literature Review - Munich Personal RePEc Archive,https://mpra.ub.uni-muenchen.de/122831/1/MPRA_paper_122831.pdf

9. Integrating Artificial Intelligence in Entrepreneurship Education: A Study of Higher Education Institutions in the Middle East - Preprints.org, https://www.preprints.org/manuscript/202408.1140/v1

10. Entrepreneurship | Journal of Labour Economics: Vol 23, No 4, https://www.journals.uchicago.edu/doi/abs/10.1086/491605

11. AI and Returns to Experience in Entrepreneurship - Ziqing Yan, https://ziqingyan.com/files/AI_Yan_Zhou_09222025.pdf

12. Artificial intelligence and teacher professionalisation: a study ..., https://africanscientificjournal.com/index.php/AfricanScientificJournal/article/download/1305/1195/1333

13. The Institutional Foundation of AI readiness: Analysis of developing economies, accessed https://wjaets.com/sites/default/files/fulltext_pdf/WJAETS-2025-1534.pdf

14. Global Public Sector AI Index 2026 | Alice Labs, https://alicelabs.ai/reports/global-public-sector-ai-index-2026

15. (PDF) From Aspiration to Implementation: The African Union AI Continental Strategy and the Development-Governance Paradox - ResearchGate, https://www.researchgate.net/publication/396230260_From_Aspiration_to_Implementation_The_African_Union_AI_Continental_Strategy_and_the_Development-Governance_Paradox

16. UNESCO in Action: Highlights for Education in 2025, https://www.unesco.org/fr/articles/lunesco-en-action-temps-forts-pour-leducation-en-2025

17. GEM 2025/2026 Global Report: From Uncertainty to Opportunity, https://www.gemconsortium.org/reports/latest-global-report

18. From Resistance to Readiness: Driving AI Adoption among Blue-Collar Workers - University of Pretoria, https://repository.up.ac.za/bitstreams/f78f9457-5668-44c6-88d2-a58d6c97cd75/download

19. Government AI Readiness Index 2025 - Oxford Insights https://oxfordinsights.com/ai-readiness/government-ai-readiness-index-2025/

20. The African Union's Continental AI Strategy: Data Protection and Governance Laws Set to Play a Key Role in AI Regulation - The Future of Privacy Forum, https://fpf.org/blog/the-african-unions-continental-ai-strategy-data-protection-and-governance-laws-set-to-play-a-key-role-in-ai-regulation/

21. 2.8. Presentation of the theoretical multinomial Logit model. Working hypotheses - Online Thesis - Analysis of the determinants of the adoption of water and soil conservation technologies in Burkina Faso - Janvier Kinihttp://www.memoireonline.com/09/11/4812/m_Analyse-des-determinants-de-ladoption-des-technologies-de-conservation-des-eaux-et-des-sols-au-B14.html

22. From Commitment to Action: Advancing the Use of AI in Education in Africa | IDRC, https://idrc-crdi.ca/fr/recherche-en-action/de-lengagement-laction-faire-progresser-lutilisation-de-lia-dans-leducation-en

23. The Uneven Impact of Generative AI on Entrepreneurial Performance - Harvard Business School, Chttps://www.hbs.edu/ris/Publication%20Files/24-042_9ebd2f26-e292-404c-b858-3e883f0e11c0.pdf

24. AI in African education: progress or loss of memory - UNESCO, https://www.unesco.org/fr/articles/lia-dans-leducation-africaine-progres-ou-perte-de-memoire-culturelle

25. Envisioning Africa's AI governance landscape in 2024 – ECDPM, https://ecdpm.org/work/envisioning-africas-ai-governance-landscape-2024

26. Vol. 11 No 130 (2025) - Revue Belge, https://revuebelge.com/index.php/accueil/fr/issue/view/130

27. Education data | Global Partnership for Education, https://www.globalpartnership.org/fr/results/education-data-highlights

28. (PDF) Hybrid Global Governance for Responsible and Inclusive Artificial Intelligence: Proposing a New Sustainable Development Goal 18 - ResearchGate, https://www.researchgate.net/publication/397646141_Hybrid_global_governance_for_responsible_and_inclusive_Artificial_Intelligence_Proposing_a_new_Sustainable_Development_Goal_18