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Artificial Intelligence and the Future of Work in South Africa: Redesigning Education, Industrial Policy and Fiscal Incentives for Productivity Growth and Inclusive Development

Introduction

In October 2025, Nvidia became the first company in history to reach a $5 trillion market valuation which was powered by the global artificial intelligence boom (Nishant and Singh, 2025). In the same month, Statistics South Africa released its Quarterly Labour Force Survey showing that youth unemployment (ages 15–34) stood at 43.8% with overall unemployment at 31.4% (Stats SA, 2025). These two facts, juxtaposed, capture the central tension of South Africa's AI moment: the country stands at the precipice of a technological revolution that could either catalyse inclusive growth or deepen the world's most persistent unemployment crisis.

In his 2026 Budget Speech, Finance Minister Enoch Godongwana declared that "the use of data and artificial intelligence has become critical for the future development of economies worldwide" and that "data infrastructure should be considered as critical as electricity, ports and transport networks" (National Treasury, 2026). Furthermore, PwC's 2025 South Africa Economic Outlook shows that AI has the potential to boost the country's real GDP by an additional 6.0 percentage points by 2035 *if and only if* the country can reduce inequality of access to AI tools and develop the skills needed to use them (PwC, 2025). The conditional nature of this promise is the crux of the policy challenge.

Recent academic literature reinforces this conditional logic. Evidence suggests that Low-Income Countries (LICs) and Lower-Middle-Income Countries (LMICs) may not benefit from AI as much as wealthier countries. One reason is that these economies have fewer knowledge-intensive industries and services which are among the areas where AI is currently generating the greatest productivity gains (OECD, 2025). They also face several challenges that make it harder to adopt and benefit from AI, including limited digital infrastructure, gaps in education and workforce skills, difficulties accessing the financing needed to invest in AI technologies, and regulatory systems

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that are still developing (Khan et al., 2024). Together, these barriers could widen the existing global productivity divide if countries with fewer resources are unable to fully participate in the AI-driven economy. The World Bank's firm-level analysis also warns that developing countries could struggle to reap the benefits of the AI revolution because advanced digital technologies diffuse more slowly and are used less intensively in lower-income countries with intensive use more strongly associated with productivity than adoption alone (Cirera et al., 2026). These findings speak to the core of this essay: South Africa's AI opportunity is real but it is dependent on deliberate and coordinated policy action?

This essay argues that South Africa must pursue a three-pronged strategy. Firstly, by fundamentally redesigning its education and skills development system to incorporate AI literacy from foundation phase through tertiary education. Secondly, reframing its industrial policy to position AI as a productivity multiplier in sectors where South Africa has comparative advantage such as financial services, mining, agriculture and manufacturing. Third, implement fiscal incentives that reward AI adoption. These AI adoptions should complement human labour rather than displacing it. The Gen Z perspective is central to this analysis, not merely because young South Africans bear the brunt of unemployment but because they are already leading AI adoption in ways that should inform policy design.

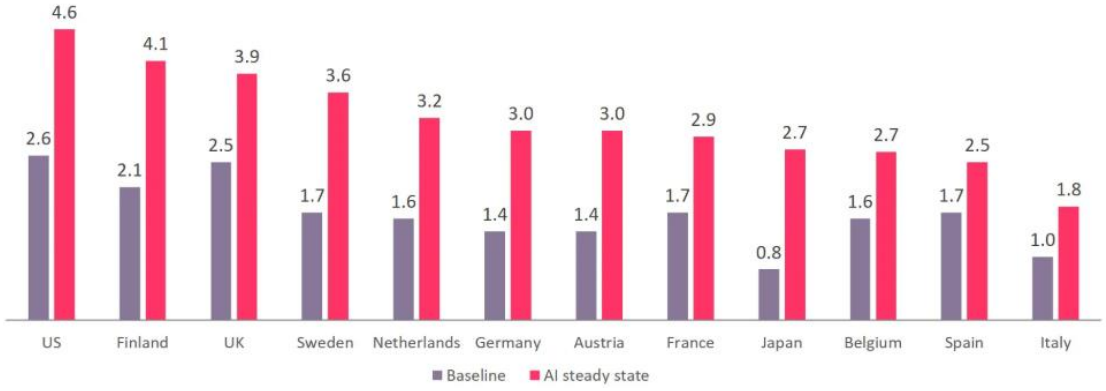
The Productivity Promise

The global evidence base for AI's productivity-enhancing potential is far from speculative. One of the most widely cited foundational studies comes from Accenture which modelled the impact of AI on 12 developed economies that together generate more than 50 percent of the world's economic output. Their findings predict that AI could double annual economic growth rates by 2035 by fundamentally changing the nature of work while engendering a new relationship between man and machine as shown in Figure 1 below. This is in turn will boost labour productivity by up to 40 percent. For example, AI was projected to increase the annual growth rate from 2.6 percent to 4.6 percent by 2035 in the United States thus translating to an additional USD $8.3 trillion in gross value added (Accenture, 2016). This is shown in Figure 2 below. Additionally, Japan had the potential to more than triple its annual rate of GVA

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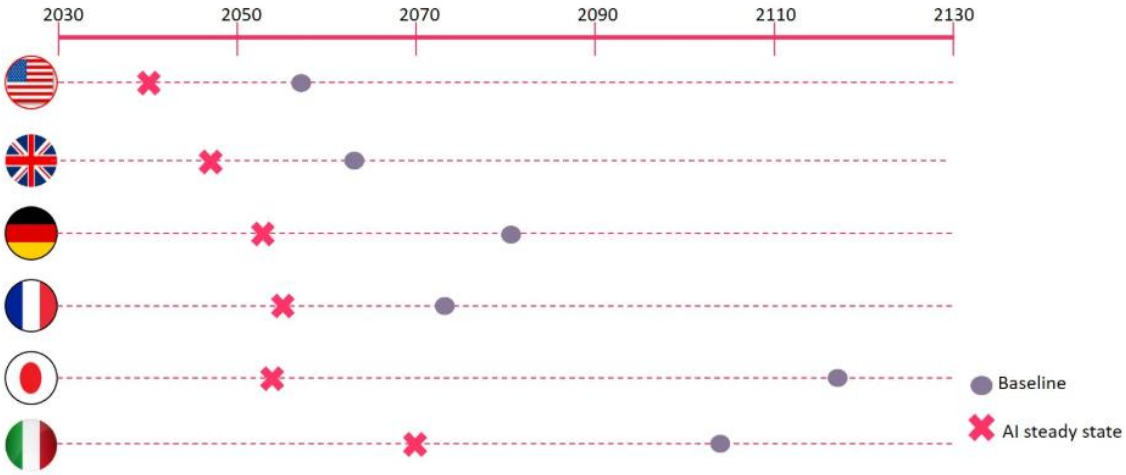
growth while Finland, Sweden, the Netherlands, Germany and Austria could see their growth rates double.

Figure 1: Gross value added (a near approximation of GDP) growth rates by 2035, comparing baseline growth to an artificial intelligence scenario in which AI has been integrated into the economy



Source: Accenture (2016)

Figure 2: Higher labour productivity means economies double in size sooner—the gap between baseline and AI scenarios shows how many years AI shaves off by 2035



Source: Accenture (2016)

So, what do these Accenture numbers actually mean for South Africa? Not as much as they might seem at first glance. Accenture modelled 12 developed economies. Countries with fast internet, strong schools and industries already comfortable with new technology. South Africa is not there yet. However, the study still matters because

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it shows us why AI pays off in some places and not others. The study found that the productivity gains come from giving people better tools so they can spend more time doing what humans are actually good at such as creating, imagining, and solving new problems. The research also found that how quickly an economy doubles in size depends mostly on how well it spreads new technology across the whole country and not just in a few fancy firms (Accenture, 2016). That is exactly where South Africa struggles. We could have all the AI tools in the world (many of them are free and open-source anyway). However, if our internet is unreliable, our schools are not producing the right skills and our policies pull in different directions, the gains will pass us by. The Chaar et., al (2025) puts it bluntly: poorer countries "risk benefiting less from AI" because their economies do not have enough knowledge-intensive industries where AI actually makes money. So the Accenture projections are both exciting and sobering. The productivity dividend is real but nobody is going to hand it to us. South Africa has to build the capacity to earn it.

The economic case for AI adoption in South Africa is compelling. PwC's modelling suggests that AI could contribute 1.2 percentage points to national GDP over the next decade even at current adoption levels. This could rise to 6.0 percentage points if access and skills inequality are addressed (PwC, 2025). Huawei research indicates that AI could contribute between R1 trillion and R1.4 trillion to South Africa's GDP by 2030 and create between 200,000 and 400,000 ICT jobs by the same year (Tredger, 2026).

A 2026 study of India and Karnataka examining AI and economic growth in emerging economies finds that AI adoption can increase total factor productivity (TFP) by 15 – 25% and contribute an additional 1–3% to annual GDP growth in high-readiness EMEs (Haci et al., 2026). However, the study emphasises that AI has enormous promise but its advantages depend on investments in human resources, digital infrastructure and governance structures (Haci et al., 2026). The Bank for International Settlements also highlights that the productivity and growth effects of AI range greatly between nations AI (Gambacorta et al., 2025).

South African financial institutions are already demonstrating measurable returns. Capitec Bank has put AI tools in the hands of nearly 5,000 employees and has reported that AI-driven models blocked over 131,000 fraudulent beneficiaries,

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prevented more than 394,000 scam payments and avoided approximately R673 million in potential client losses in a single financial year (McLeod, 2026). Absa's deployment of Salesforce's Agentforce agentic AI reduced administrative time for relationship managers by 75% to 90%, flipping the ratio of customer-facing to administrative work (Ramakumba, 2026).

The Displacement Risk

Nonetheless, the productivity promise is shadowed by profound displacement risk. The sectors most exposed to AI-driven automation in South Africa are mining, agriculture, manufacturing and basic administrative functions. These are precisely those that employ large numbers of low-skilled workers (HSRC, 2025). In labour-intensive sectors such as mining, agriculture and manufacturing, automation is already displacing workers through machine-operated drills, automated sorting systems, and precision agriculture technologies (Paredes and Fleming-Muñoz, 2021; Mokhaukhau and Chauke, 2026).

In their study, Giwa and Ho use quarterly data from 2014 to 2024 and a Structural Vector Autoregression (SVAR) model to examine how AI shocks shape employment dynamics in South Africa's manufacturing sector. Their findings are stark. They find that a positive AI shock triggers an immediate and statistically significant contraction in employment with this negative effect persisting over the short to medium term. They also find a variance decomposition showing that AI shocks are responsible for almost 30% of the forecast-error variance in industrial employment over ten quarter period (Giwa and Ho, 2025). These findings highlight the critical need for policies that promote human-AI complementarity such as reskilling and incentives for labour-augmenting technology and show the unique risks of automation in poor economies (Giwa and Ho, 2025).

A 2024 study also examines the relationship between AI and low-skilled employment in South Africa using a Vector Error Correction Model (VECM) approach from 2012Q1 to 2021Q4. The study's findings demonstrate a long-term, substantial negative relationship between low-skilled employment and artificial intelligence with Granger causality tests demonstrating that AI investment unidirectionally causing low-skilled employment (Giwa and Ngepah, 2024). As a policy recommendation, the report suggests putting in place training programs to provide employees the skills they need

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to adjust to the changing labour market brought about by technology improvements (Giwa and Ngepah, 2024).

Moreover, the HSRC's analysis further cautions that AI has the potential to exacerbate South Africa's inequality by displacing workers and widening digital divides. To ensure that AI advances common values like Ubuntu rather than exacerbating inequality or undermining human dignity, ethical governance, inclusive innovation - policies that reflect local culture are necessary (HSRC, 2025).

The threat extends beyond manual labour. Entry-level and junior jobs face severe disruption over the next decade as AI automates routine cognitive work (Meyer, 2026). The World Economic Forum's Future of Jobs Report 2025 estimates that 41% of employers globally intend to reduce their workforce where AI can automate tasks (WEF, 2025). For a country where 43.8% of young people are already unemployed, this represents an existential threat.

The Current Crisis

South Africa's education system is failing to prepare learners for an AI-augmented economy. The country has 118,000 unfilled digital roles and a 37% vacancy rate of which 41,000 are junior-level positions ideal for youth (Public Sector Manager, 2025). Yet employers report that only 42% of IT job applicants qualify for the positions they seek (Mapenzauswa, 2026).

The digital divide compounds the problem. Further research examines AI literacy among South African university students using a qualitative research design with seventy-eight respondents. The results show that although students acknowledge AI's potential to improve learning, they have trouble with ambiguous institutional policies, unequal access to digital resources and concerns about academic integrity when utilizing AI tools (Ngoveni, 2025). According to the study, a large number of students voiced uncertainty about what constitutes appropriate AI use and demanded organized AI literacy programs, more precise rules and active faculty participation in AI-related training (Ngoveni, 2025).

Research on rural South African universities similarly finds that students face additional obstacles such as poor internet infrastructure, out-of-date educational resources, little exposure to new technology and few chances for real-world

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cooperation (Omodan, 2025). The study adds to the literature by clarifying the digital readiness gaps faced by rural students and suggests interventions to close infrastructure gaps. It is guided by the Technological Acceptance Model and interpreted through Van Dijk's Digital Divide Model and Sen's Capability Approach (Omodan, 2025).

The theoretical framing matters here. Alane (2026) makes the following claims using the Critical Digital Inclusion Theory, Social Constructivism of Technology and the Capability Approach: (1) access by itself does not guarantee inclusion; (2) algorithmic systems tend to maintain social hierarchies unless regulated for fairness; (3) capabilities like skills, literacy and agency convert access into empowerment and (4) inclusive governance aligns AI development with social justice objectives. This framework suggests that South Africa's education response must go beyond providing devices and connectivity to building genuine human capabilities.

A Framework for AI-Ready Education

The Department of Basic Education has taken initial steps by introducing Coding and Robotics as a gazetted subject for Grades R–9 with a phased rollout strategy starting with unplugged coding in foundation phase and progressing to robotics and AI-driven learning management systems (DBE, 2024; Ngcumbe, 2026). However, curriculum reform alone is insufficient.

The UNCTAD Technology and Innovation Report 2025 provides a global framework for AI education policy. It highlights that partnerships between academia and the private sector can help develop AI talent to meet specific industry needs and drive AI development. It also supports that integrating science, technology, engineering and mathematics (STEM) and AI subjects from early education to continuous learning can achieve population-wide AI literacy which encourages widespread AI adoption (UNCTAD, 2025). The policy recommendations in the paper emphasize the need for national plans to be coordinated across industries, trade, education, infrastructure and STI. (UNCTAD, 2025).

Furthermore, a study of 50 nations' National AI Strategies to identify priorities for educational policy found that the most successful methods integrate the development of AI competency across labour and education policies rather than considering them as sperate domains (Shi, 2025). This finding has direct implications for South Africa's

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fragmented approach where basic education, higher education and skills development operate in relative isolation.

Therefore, three structural interventions are required. First, embed AI literacy across all subjects and not just as a standalone technology module**.** The current approach risks creating a two-tier system where only students who elect Coding and Robotics gain AI exposure. AI literacy which involves understanding what algorithms are, how they make decisions and how to interrogate their outputs should be integrated into mathematics, social sciences and languages from Grade 4 onwards. This aligns with international best practice identified in comparative policy analysis (Tshidi and Dewa, 2024).

Second, address the teacher capacity crisis**.** Microsoft's partnership with the Department of Higher Education and Training to offer AI in Leadership Training to all TVET college principals is a step in the right direction but it must be scaled to reach every teacher in the basic education system (DHET, 2025).

Third, create clear pathways from school to AI-enabled employment**.** The MICT SETA's candidacy programme with Unisa Enterprise which trains graduates in AI, data science, cybersecurity and IoT provides a model for industry-aligned skills development (Unisa Enterprise, 2025). The private sector's commitment i.e. Microsoft's pledge to train one million South Africans in AI skills by 2026 demonstrates that industry is willing to invest but government must ensure coordination and accreditation (Presidency, 2025; SA News, 2025).

Industrial Policy: AI as Productivity Multiplier, Not Job Destroyer

The Sectoral Opportunity

South Africa's industrial policy must move beyond a defensive posture of protecting jobs from automation and towards an offensive strategy of using AI to create higher-productivity, higher-wage employment. The manufacturing sector which contributes 13.5% of GDP, is already shifting toward "smart factories" using automation, robotics, and AI to streamline operations (Research and Markets, 2025).

The financial services sector provides the most compelling evidence that AI can be productivity-enhancing rather than labour-displacing. Old Mutual has deployed AI-driven automation of high-volume processes, reducing claims processing from days

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to minutes and enabling personalised financial advice at scale (Setshabi-Mushonga, 2025). Critically, Old Mutual emphasises "empowering people, not replacing them" with AI tools enabling advisers to engage in more meaningful conversations and resolve complex issues (Old Mutual Limited, 2020).

Capitec's experience reinforces this. Despite deploying AI extensively which includes an AI agent embedded in business banking credit processing, the bank also added 711 employees and increased salaries by 12% (McLeod, 2026; Ndlovu, 2026). A theoretical explanation is offered by the World Bank's firm-level analysis of AI adoption in developing nations: AI adoption is mainly linked to worker reassignment rather than displacement or net employment reduction but the study warns that AI adoption is still restricted and concentrated among larger, more productive, better-managed and technologically advanced firms thus offering little evidence of technological leapfrogging (Cirera et al., 2026)

A Strategic Framework for AI-Enabled Industrial Policy

South Africa's industrial policy should prioritise three sectors where AI can generate robust productivity gains. The financial services sector. This sector is already South Africa's most AI-mature with 85.4% of African banking leaders saying AI is a priority, 64.8% using it for customer service, 47.7% for fraud detection and 45.3% for credit scoring (Kan, 2025). South Africa's banks have a regional competitive advantage that should be leveraged to export AI-enabled financial services across Africa. The OECD's Africa Capital Markets Report 2025 notes that while global AI investment exceeded $100 billion in 2024, Africa saw only one notable AI deal valued under $100 million. A gap that represents opportunity, not inevitability (OECD, 2025).

The mining and manufacturing sector. AI-enabled predictive maintenance, autonomous drilling and real-time ore-grade analysis can extend the life of South Africa's mineral assets while improving safety. However, the Giwa and Ho (2025) study's finding that AI shocks explain nearly 30% of employment variance in manufacturing over a ten-quarter horizon underscores the need for deliberate augmentation strategies. The Department of Trade, Industry and Competition's development of a Mineral Beneficiation Index as a central monitoring instrument signals that AI can be deployed to move South Africa up the value chain rather than simply exporting raw materials (Parliament of South Africa, 2025; SA News, 2026).

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The agricultural sector. AI-powered drone monitoring in South Africa has increased yields while reducing pesticide use and AI advisories in Kenya have reached over 700,000 farmers with real-time advice (De Villiers, 2024 et al., 2024; CGIAR, 2026; JETRO, 2026). The MIT Internet Policy Research Initiative's analysis of AI strategy in developing economies identifies unique local datasets such as such as regional agricultural patterns, the differences in languages and public health records as a major competitive advantage for developing nations. This is because the data is crucial for training AI models to address particular local issues that global models ignore (Pitt and Reynolds, 2025).

The UNCTAD Technology and Innovation Report 2025 provides a broader framework. It posits that while it may be more immediately practical to support AI adoption for specific sectoral needs, developing countries should also make long-term strategic plans to steer their own AI development. Otherwise, as latecomers, they may be left with few options. Developing countries should swiftly set and implement AI strategies

Pitt and Reynolds (2025) further argue that strategically utilizing their own unique advantages rather than copying the capital-intensive models of developed economies is the best AI strategy for emerging nations. Large, flexible workforces that are perfect for the crucial, labour-intensive tasks of data annotation and human-in-the-loop (HITL) procedures are among these benefits. They also offer a direct entry point into the AI value chain and a route for upskilling (Pitt and Reynolds, 2025).

Figure 3: AI Productivity Impact: Global and South African Projections

Metric	Value
Global GDP boost from AI (PwC most likely scenario)	+7.7 pp
South Africa GDP boost by 2035 (PwC, conditional on skills)	+6.0 pp
South Africa GDP boost at current adoption levels	+1.2 pp
AI contribution to TFP in high-readiness EMEs	+15–25%
AI contribution to annual GDP growth in high-readiness EMEs	+1–3%
Potential AI contribution to SA GDP by 2030 (Huawei)	R1–1.4 trillion

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AI/ICT jobs potentially created by 2030	200,000–400,000

Source: PwC (2025); Haci et al., (2026); Tredger (2026)

Current Incentive Landscape

The fiscal framework for AI in South Africa is still developing. The R&D Tax Incentive governed by section 11D of the Income Tax Act allows companies undertaking scientific and technological R&D to qualify for a 150% tax deduction for operational R&D expenditure (OECD, 2025). A crucial increase was made in the 2026 Budget Speech including claims pertaining to software created for internal systems such as ERP platforms, fintech solutions, logistics engines and internal AI tools are now eligible. (Visser, 2026).

Gen Z's AI Paradox

Gen Z South Africans occupy a paradoxical position. They are the most enthusiastic adopters of AI globally with 86% of respondents aged 18–34 globally expressed intentions to use AI in daily activities (Kaspersky, 2025). OECD research finds that young people aged 18–35 in South Africa are leading AI adoption compared to European counterparts (Lechman, 2026; OECD, 2025).

A study in Croatia explores Generation Z students' perceptions of AI across two universities. The results suggest a generally positive attitude toward AI, emphasizing the benefits of efficiency and productivity while students also expressed significant concerns regarding the accuracy, reliability and ethical aspects of AI (Drašković et al., 2025). Thus, stressing the need for human supervision and data security measures. Additionally, the study also points out major issues related to the displacement of jobs by AI and the importance of continuous learning to stay relevant in an AI-driven job market (Drašković et al., 2025).

Balcerzak, Zinecker and Mičánek (2026) examine usage patterns and delegation boundaries among Generation Z representatives. Their results show that Gen Z uses AI as a supportive tool but still prefers human control. This points out that Gen Z is not simply accepting AI at face value but is developing sophisticated frameworks around when and how they should offload tasks to artificial intelligence systems.

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Therefore, Gen Z perspective should not be an afterthought in AI policy, it should be constitutive. Too often, youth are "consulted" after policies are drafted. Gen Z's facility with AI tools means they can contribute substantively to policy design. The Budget Speech Competition itself now in its 55th year demonstrates that young economists have more refined, implementable ideas about AI and employment.

Conclusion

South Africa's AI moment is not a future scenario to be prepared for, it is a present reality unfolding in bank branches, insurance offices and manufacturing plants across the country. Capitec has already deployed AI to 5,000 employees. Old Mutual processes claims in minutes that once took days. Absa's relationship managers now spend 90% of their time with customers rather than preparing for meetings.

The academic evidence is clear on both the opportunity and the risk. The PwC estimate of a 6.0 percentage point GDP boost by 2035 is achievable but only if the country addresses the inequality of access and skills that currently characterises its digital economy. Evidence points that AI shocks explain nearly 30% of employment variance in manufacturing and highlights the scale of the disruption risk. Further findings reveal a significant negative correlation between AI and low-skilled employment in the long run which provides empirical justification for proactive social protection.

Gen Z South Africans, the generation that will live longest with the consequences of today's policy choices, are already demonstrating that they are not passive victims of technological change. They are the most enthusiastic AI adopters. The most eager for AI training and through mechanisms like the Budget Speech Competition, the most articulate in proposing solutions. The 43.8% youth unemployment rate is a moral indictment of the pre-AI economy. AI could make it worse or it could be the catalyst for finally addressing it.

The choice is ours. The policies outlined in this essay such as integrated education reform, AI-enabled industrial policy and augmentation-focused fiscal incentives offer a pathway to harness AI for productivity growth while limiting labour market disruptions. However, policy design is only as good as the political will to implement it. The 2026 Budget Speech's recognition of data infrastructure as critical economic infrastructure is a beginning. What South Africa needs now is the courage to follow

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through. To invest in AI literacy as a citizenship right, to reward AI adoption that augments rather than displaces human labour and to ensure that the productivity gains from AI are shared broadly enough to build a more just and prosperous society.

Recommendations

South Africa should introduce an AI Augmentation Tax Credit. Parmentier's (2026) benchmark calibration points out that AI compresses rather than widens the skill premium thus robots should be taxed while AI is subsidised. Fiscal policy may need to encourage adoption, not slow it down. That means the tax system should separate AI that augments human labour from AI that displaces it. Perhaps a 120% deduction for systems that demonstrably raise productivity in roles that stay human-occupied versus 100% for systems that mainly automate existing positions. Evidence from China suggests targeted incentives work. Accelerated depreciation lets firms front-load allowances, creating a tax shield that lowers the cost of capital and nudges pilot firms toward AI uptake (Zhu and Liang, 2026). Alongside this, the SEZ model could become AI Innovation Zones. Offering accelerated depreciation on data centre equipment, reduced VAT on imported servers and cooling systems and streamlined visas for AI specialists (Balogun, Nnamdi and Maulana, 2025). This is sensible given South Africa's 50-plus data centres and roughly R50 billion investment pipeline over the next three years (Rziga, 2026; SONA 2026).

In the immediate term the main focus should be on creating basic skills and making sure that the next group of students leaving school understand artificial intelligence. Moreover, that people who are already using AI in the finance industry can grow their work with the right support. In the medium-term South Africa can start to sell AI-powered services and products using the strength of the finance sector in the region. In the long term the aim is an AI system that keeps itself going where the improvements in work efficiency are used to improve people’s skills and protect society.

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