HOW SHOULD SOUTH AFRICA REDESIGN EDUCATION, INDUSTRIAL POLICY AND FISCAL INCENTIVES TO HARNESS AI FOR PRODUCTIVITY GROWTH WHILE LIMITING LABOUR MARKET DISRUPTIONS?

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1. INTRODUCTION

What once seemed like a distant future is now knocking at our doors. AI is no longer a distant technological possibility; it is rapidly transforming the productive capabilities of economies, challenging traditional labour structures and reigniting concerns about technological unemployment, productivity and the future of work. South Africa cannot afford to ignore these developments. As the global economy enters an AI transition, with almost 40% of jobs worldwide exposed to AI (Cazzaniga et al., 2024), South Africa is being drawn in through global integration (BPESA, 2025), while its labour market is already in crisis.

The official unemployment rate reached 33.7% in the third quarter of 2026, and 13.2 million people (44%) were either unemployed or in the potential labour force (Stats SA, 2026a). Among young people aged 15–24, unemployment stood at 62.8% in the second quarter of 2026 (Stats SA, 2026b). Meanwhile, labour productivity has barely grown since the 2008 global financial crisis, with the slowdown in total factor productivity the largest drag on growth (Medici et al., 2025; Steenkamp and Fourie, 2026). Recent gains in labour productivity have been driven mainly by job losses rather than by any real improvement in the economy's capacity to produce (SARB, 2026).

In this context, two questions confront South Africa: whether AI will materially reshape its labour market, and whether the country is prepared if it does. The second question is pressing, as CHEC and Western Cape Government (2026, p. 7) observe, "the core challenge lies in the unprecedented speed of AI adoption, which is outpacing the adaptive capacity of our institutions." Any AI-driven job displacement would compound an existing labour market crisis rather than create a new one, raising the risk of what Keynes (1930) described as "technological unemployment": job losses that occur faster than the economy can find new work for those displaced. Given these labour market conditions, Naidoo (2026), CEO of the Youth Employment Service, warns that South Africa cannot afford for AI to "deepen unemployment and destroy entire categories of entry-level jobs for young people." He argues that large-scale displacement would weaken consumer demand and fuel social instability, damaging the economy over the long term (Naidoo, 2026), an outcome South Africa can ill afford after more than a decade of weak growth (Medici et al., 2025).

Since AI adoption is already under way, the policy challenge is not whether to adopt, but how. Harambee and Bridgespan (2026) contend that South Africa need not follow countries that compete on cheap, heavily automated services; instead, it can direct AI towards supporting workers rather than substituting for them, protecting an already vulnerable labour market while still capturing productivity gains (Mohapatra et al., 2026; Naidoo, 2026). This paper analyses how South Africa can redesign education, industrial policy and fiscal incentives to harness AI

for productivity growth while limiting labour market disruption through AI augmentation. The paper first defines its key concepts, then diagnoses why South Africa's current education, industrial, and fiscal policies are unlikely to deliver augmentation. It then draws lessons from international experience, proposes a policy package and considers its risks and trade-offs, before concluding.

2. KEY CONCEPTS

2.1. Productivity growth

The paper focuses on labour productivity, defined as how much output an economy produces for each unit of labour it uses. Internationally, the preferred measure divides GDP by total hours worked (OECD, 2019a). Productivity SA (2019), instead, measures output per person employed, owing to a lack of reliable data on hours worked. Growth accounting splits changes in labour productivity into three parts: capital deepening, which occurs when each worker has more capital equipment to work with; a rise in labour quality, which reflects a more skilled and experienced workforce; and multifactor productivity (MFP), which captures gains in how efficiently capital and labour work together (ABS, 2026; OECD, 2019a).

MPF, also known as total factor productivity (TFP), is not observed directly. Instead, it is calculated as whatever output growth is left over once the contributions of more labour and more capital have been accounted for, which is why it is often used as an indicator of technological progress (OECD, 2019a). Productivity SA's 2025 statistics now adjust inputs for workforce characteristics such as skills and education, which makes this breakdown easier to apply to South Africa (ILO, 2025). This breakdown matters for the argument of this paper, because labour productivity is output divided by employment; it rises when output grows faster than employment, but also rises when employment falls. The SARB (2026) observes that the second pattern explains much of the recent improvement in formal-sector productivity. This paper treats AI-driven productivity growth as successful only when it comes from higher MFP and a more skilled workforce, and when employment holds steady or grows.

2.2.Automation versus Augmentation

Acemoglu and Restrepo (2019) offer a framework for telling apart technologies that replace workers from those that complement them. When machines take over tasks that people used to do, the displacement effect lowers labour's share of national income and reduces the demand for workers, even if output per worker rises. When technology instead generates new kinds of work that people are better suited to than machines, a reinstatement effect increases the demand for labour. In this paper, augmentation means AI adoption that strengthens the reinstatement effect, by raising workers' productivity in what they already do or by opening up new tasks for them. Acemoglu and Restrepo (2019) also warn against "so-so technologies": automation that removes jobs without delivering much in terms of productivity. In this framework, the technological unemployment that Keynes (1930) warned of occurs when displacement outpaces reinstatement. Keynes regarded it as a "temporary phase of maladjustment"; this paper argues that how long and how costly that adjustment proves in South Africa depends on policy.

3. DIAGNOSIS: WHY CURRENT POLICY WON'T DELIVER AUGMENTATION

South Africa needs to move from reacting to AI to actively shaping its adoption. Naidoo (2026) argues for a "pro-employment" model in which the state discourages displacement, rewards augmentation, and incentivises innovation that complements workers. However, South Africa's current policy framework is not designed to deliver this outcome. Its education, industrial policy and fiscal incentives were built for a pre-AI economy, and none currently distinguish between AI that augments workers and AI that replaces them. Currently, no AI policy coordinates the three levers. Cabinet approved South Africa's Draft National AI Policy on 25 March 2026 (Coelho et al., 2026), but the policy was fully withdrawn through a Government Gazette on 12 June 2026, after it emerged that it contained AI-hallucinated references (ITWeb, 2026). The Department of Communications and Digital Technology (DCDT) is still targeting this financial year (2026/27) to finalise a revised policy (Mzekandaba, 2026). Until then, South Africa has no national framework that sets augmentation as a policy goal. In the absence of a coordinating framework, the outcome of AI adoption depends on South Africa's existing education, industrial, and fiscal policies. The following sections assess each in turn, asking what currently exists, why it is unlikely to deliver augmentation, and what needs to be addressed.

3.1.Education

3.1.1. Sequencing

South Africa's current approach to education rests on the CAPS curriculum, with a renewed emphasis on foundation literacy and numeracy in the early grades (Greyling, 2025). However, these foundations remain weak: 81% of Grade 4 learners cannot read for meaning in any language (DBE, 2023), and only 34% of the 901 790 matric candidates in 2025 took pure mathematics, with the pass rate falling from 69% to 64% (Mabasa, 2026). Experts trace this decline to gaps that build up from the earliest grades, rather than to any recent fall in teaching standards (Mabasa, 2026). This matters for AI adoption because literacy and numeracy form the foundation for higher-order skills such as analytical reasoning (OECD, 2019b). Learners who cannot read for meaning or reason mathematically will struggle to use AI critically, to evaluate its outputs and to identify its errors. Addressing this requires adopting what Mabasa, summarising Henning's view, calls "more appropriate and engaging teaching methods" (cited in Mabasa, 2026), an approach echoed by CHEC and Western Cape Government (2026), which highlights gamification, interactive learning and AI-supported personalised tutoring. Rather than treating foundations and AI literacy as competing priorities, AI can be embedded as a tool for teaching foundational skills, with explicit AI literacy introduced once learners can read and reason.

3.1.2. Delivery

South Africa has gazetted a Coding and Robotics curriculum and is developing a National AI in Education Framework (DBE, 2026). However, the rollout of Coding and Robotics has been repeatedly delayed and will not become compulsory in the near future, owing to the costs of teacher training, equipment and infrastructure (Pongweni, 2025). Schools also lack national

AI guidance, while learners and teachers already use AI tools without safeguards or training (Eadie, 2026). Addressing this requires national guidance for schools, teacher training, and prioritising the unplugged, device-free components of the curriculum, which can be delivered without new infrastructure (Greyling, 2025).

3.1.3. Pipeline

The post-school system consists of universities, TVET colleges and SETAs. In January 2026, the Minister of Higher Education, Buti Manamela, noted that approximately 345 000 learners obtained bachelor passes in the 2025 NSC, yet South Africa's public universities can accommodate only approximately 230 000 first-time entering students each year (South African Government, 2026). TVET colleges, the national alternative pathway, are not equipped to absorb the remainder: the NC(V) throughput rate was only 13.9% in 2024 (DHET, 2026). SETAs, meanwhile, are intended to connect training to jobs, but the Minister acknowledges that they still function largely as channels for disbursing funds rather than as drivers of employment outcomes (Molefe, 2026). With the skills development levies projected at R27.7 billion in 2026/27, Manamela argues that "the skills levy is not a tax. It is an investment. And investors expect a return" (cited in Molefe, 2026). Yet governance failures, which the Minister acknowledges reflect weaknesses in the SETA model itself, mean that this return is not being realised (Paoli, 2025). Addressing this requires repositioning TVET colleges as a first-choice pathway rather than a fallback, reforming SETAs around employment outcomes, and building a system for retraining adults.

3.2.Industrial Policy

South Africa's industrial policy now rests on the Industrial Development Strategy (IDS) 2026, which organises policy around three priorities: decarbonisation, diversification and digitalisation, to halt the erosion of the country's industrial base (DTIC, 2026). The IDS builds on earlier sectoral master plans, among them the Global Business Services (GBS) Master Plan. The extent of this erosion is visible in the productivity data. Steenkamp and Fourie (2026) find that productivity has fallen across most industries since the 2008 financial crisis, with the steepest declines in mining, manufacturing and construction; these goods-producing sectors are the ones the IDS most seeks to revive.

The IDS prioritises sectors that create a large number of jobs, naming Global Business Services (GBS) and tourism as key employers of women and youth (DTIC, 2026). Yet, its digitalisation pathway treats technology as a "cross-cutting productivity and competitiveness driver" and proposes "integrating digital technologies, automation, and AI across priority value chains" (DTIC, 2026, p. 7), without distinguishing between technology that complements workers and technology that displaces them. The sectors chosen to create jobs are the same sectors in which automation is promoted without employment safeguards. Given that South African industrial policy has previously encouraged firms to replace workers with machinery (McCarthy, 2005), AI adoption risks raising measured productivity by cutting jobs rather than by raising MFP.

The IDS acknowledges a skills gap (DTIC, 2026), but Kahn (2026) argues it gives too little weight to education and skills. GBS is the exception: its skills strategy targets AI-augmented

roles (BPESA, 2025), and Harambee and Bridgespan (2026) find that AI in BPO and tourism is currently redesigning entry-level jobs rather than eliminating them. They caution that this depends on training systems keeping pace, and their evidence covers services only. Addressing this requires embedding augmentation criteria into digitalisation pathways, linking industrial policy to sector-specific skills planning, and testing whether the GBS model can be extended to other sectors.

3.3.Fiscal Incentives

South Africa's main fiscal tool for employment is the Employment Tax Incentive (ETI), which lets employers reduce their PAYE payments when they hire workers aged 18 to 29 earning up to R 7 500 a month (SARS, 2026). It is worth up to R1 500 per worker in the first year (SARS, 2026) and costs approximately R 4.8 billion in 2022/23. On the capital side, firms can deduct 150% of qualifying research and development spending under section 11D of the Income Tax Act (National Treasury, 2023).

This mix is unlikely to promote augmentation. First, capital incentives are neutral about how technology is used: a firm receives the same tax treatment whether its AI investment supports workers or replaces them. Evidence from the United States suggests that tax systems favouring capital over labour lead firms to automate beyond what is efficient (Acemoglu et al., 2020); whether South Africa's system has a similar bias remains untested. Second, the ETI's effects have been modest. It reaches only about half of eligible workers and has not necessarily raised overall youth employment (Ebrahim, 2020), leading Donaldson (2024) to conclude that "a narrowly targeted youth incentive is an inadequate intervention in the context of high unemployment." Third, the ETI expires in February 2029 (SARS, 2026), just as AI adoption is likely to accelerate, and no fiscal instrument specifically rewards firms for training workers to use AI. This contrasts with the IDS's own call for fiscal policy to prioritise "pro-poor, labour intensive, and export-oriented investments" (DTIC, 2026, p. 40).

Addressing this requires a fiscal framework that distinguishes between AI that complements workers and AI that displaces them. Naidoo (2026) argues that job losses caused by AI should be treated as a negative externality, comparable to pollution: AI uses that cause avoidable displacement could be restricted or taxed, while AI innovation that supports employment should be rewarded, funded in part by what he called "AI sin taxes." Alongside this, the ETI should be broadened and extended beyond 2029.

4. COMPARATIVE ANALYSIS

4.1.Education

4.1.1. Germany

Germany's dual system combines classroom learning at vocational schools with paid training inside firms, and enrolled around 1.2 million apprentices at the end of 2025 (Destatis, 2026). It enjoys a status close to that of a university: nearly half of German apprentices hold a university entrance qualification (Platzek, 2025), and youth unemployment stood at 5.4% in 2025 (European Commission, 2026). The system is not without strain, as thousands of young people fail to secure apprenticeships each year while other positions go unfilled (IG Metall, 2025).

The lesson for South Africa is not to replicate a system built over decades, but to adopt its principles: employer involvement in training design, workplace-based learning, and parity of esteem with university.

4.1.2. China

Since September 2025, China has required all primary and secondary schools to provide at least eight hours of AI instruction per year (Education Desk, 2025). Crucially, China pairs this with rules that vary by age. Its guidance on generative AI bars primary pupils from using it on their own, permits limited critical analysis of AI outputs in junior secondary and allows explanatory use only in senior secondary (Murphy, 2025). The guidance rests on the principle of "training as the foundation and technology as a tool," as it states that teachers "shall not use Gen AI as a substitute for teaching" (Murphy, 2025). For South Africa, this stage-based model offers a practical template for the interim guidance that is currently missing: introduce AI gradually, keep teachers in control, and protect foundational learning in the early grades.

4.1.3. **Nigeria**

A randomised trial found that six weeks of teacher-guided AI tutoring in English produced learning gains equivalent to 1.5 to 2 years of ordinary schooling (De Simone et al., 2025). This suggests that, rather than competing with foundational learning, AI can be used to support it. However, the trial involved secondary students who could already read and relied on teacher supervision.

4.2. Industrial Policy

4.2.1. Singapore

Singapore's Industry Transformation Maps (ITMs) are sector roadmaps developed jointly by government, firms and unions, each covering productivity, digitalisation, and job skills (EDB, 2022). They are complemented by Jobs Transformation Maps, which assess how AI and automation will affect jobs and skills in that sector (MTI, 2024; SWDA, 2025). Unlike South Africa's IDS, Singapore's sector strategies plan for the employment effects of technology from the outset.

4.3.Fiscal Incentives

4.3.1. South Korea

In 2018, South Korea reduced the tax credit for automation investment by large firms from 7% to 3%, effectively creating a "quasi-robot tax"(Holtmann et al., 2025). Robot installations fell by 28% relative to Japan. Financially unconstrained firms hired more workers, but the average effect on employment was not statistically significant (Holtmann et al., 2025; Ostertag, 2026). The lesson for South Africa is that discouraging automation alone does not reliably create jobs; incentives must also actively reward firms that use technology to augment their workers.

5. POLICY PACKAGE

The recommendations below follow three levers diagnosed in Section 3 and are sequenced by time horizon: short term (0–2 years); medium term (2–5 years) and long term (more than 5

years). The sequencing is adapted from the priority framework of CHEC and Western Cape Government (2026), which ranks interventions by expected impact and feasibility, and draws on the comparative evidence in Section 4.

5.1. Education

5.1.1. Short term

South African schools lack national AI guidance (Eadie, 2026). Government should issue interim, stage-based guidance modelled on China's approach, which restricts independent use of generative AI in primary school and keeps teachers in control (Murphy, 2025). Teachers should be prepared first: CHEC and Western Cape Government (2026, p. 22) rank AI literacy training for educators as a "critical priority." Because weak mathematics results reflect gaps that build up from the earliest grades (Mabasa, 2026), AI should then be used to close those gaps early. Teacher-guided AI tutoring and gamified interactive learning, proposed by CHEC and Western Cape Government (2026), should be piloted in foundational literacy and mathematics, building on the more engaging methods, such as maths animation, that Henning advocates (cited in Mabasa, 2026). Evidence from Nigeria shows that AI tutoring can raise learning outcomes substantially within weeks (De Simone et al., 2025). Round-the-clock access should follow only for older learners, since unsupervised use risks over-reliance (Murphy, 2025) and depends on devices and connectivity that many learners lack.

5.1.2. Medium term

TVET colleges should be repositioned as a first-choice pathway. Germany's dual system shows that vocational training can rival university in status when employers co-design training and provide workplace learning (Platzek, 2025). Locally, a coding programme delivered through TVET colleges by We Think Code reports retention of 93%, graduation of 88% and placement of 75% ((CHEC) and Western Cape Government, 2026). For adults in the workforce, reformed SETAs should fund micro-credentials and regional reskilling centres ((CHEC) and Western Cape Government, 2026).

5.1.3. Long term

AI education should become compulsory only once foundational outcomes improve and teachers are equipped to deliver it; CHEC and Western Cape Government (2026) themselves rate mandatory AI education as high-impact but low-feasibility.

5.2. Industrial Policy

5.2.1. Short term

The IDS digitalisation pathway should require firms receiving state support for AI adoption to report its expected employment effects and to submit job redesign plans, so that support favours augmentation over displacement.

5.2.2. Medium term

Following Singapore, each IDS priority sector and master plan should be paired with a jobs and skills map, developed with employers and unions, that assesses how AI will change jobs

in that sector (MTI, 2024; SWDA, 2025). These maps should feed directly into SETA planning through the regional industrial skills compacts the Minister has proposed (Molefe, 2026). The GBS model, which combines sector growth with AI-augmented skills development (BPESA, 2025), should be extended to tourism, where Harambee and Bridgespan (2026) find similar potential for AI to expand entry-level opportunities for young people. It should then be piloted in one goods-producing sector, such as manufacturing, to test whether it transfers beyond services; if successful, it could be extended to mining and construction, the sectors where productivity has declined most (Steenkamp and Fourie, 2026).

5.3.Fiscal Incentives

5.3.1. Short term

Government should introduce an augmentation tax credit: an enhanced deduction for spending on training employees to use AI and on redesigning their jobs around it. To prevent the credit from subsidising automation that later displaces the same workers, it should be conditional on firms maintaining or increasing employment over a set period. Singapore offers a partial precedent: its 2026 Budget provides a 400% tax deduction on qualifying AI spending, alongside support for AI skills training in non-technical professions (Ministry of Finance, 2026). Unlike the credit proposed here, however, it is not conditional on firms retaining their workers.

5.3.2. Medium term

The ETI should be extended beyond its 2029 expiry and broadened as Donaldson (2024) recommends, into a wage subsidy covering low-wage workers of all ages, reducing the relative costs of labour as AI lowers the cost of capital.

5.3.3. Long term

Naidoo (2026) proposed taxing AI applications that cause avoidable job losses. South Korea's experience counsels caution: cutting tax support for automation reduced robot investment but raised employment only among financially unconstrained firms (Holtmann et al., 2025). Any displacement levy should therefore be paired with a requirement for augmentation, with its revenue ring-fenced to fund the augmentation tax credit and the broadened ETI. The fiscal implications of this package are considered in Section 6.

6. RISKS AND TRADE-OFFS

The proposed package carries risks. First, fiscal space is limited; the DTIC's incentive budget fell by 33% between 2019/20 and 2025/26 (DTIC, 2026, p. 40), so an augmentation credit and a broadened ETI would compete with other priorities unless offset by a displacement levy. Second, discouraging automation could weaken competitiveness, particularly in GBS, where foreign clients may relocate work to countries that automate more freely. Third, implementation capacity is weak, as shown by SETA governance failures (Paoli, 2025), the withdrawn draft AI policy (ITWeb, 2026) and the stalled coding rollout. Fourth, AI tools could widen inequality if they reach mainly well-resourced schools with reliable devices and connectivity; many rural

schools lack reliable internet access, and the cost of advanced AI excludes poorer learners ((CHEC) and Western Cape Government, 2026).

7. CONCLUSION

This paper asked whether AI will materially reshape South Africa's labour market and whether the country is prepared if it does. The evidence suggests that AI is already reshaping work, but that South Africa is not yet prepared: weak foundational learning, an industrial strategy that promotes automation without employment safeguards, and fiscal incentives that are neutral about how technology is used leave the displacement effect unchecked. Preventing AI-driven displacement from outpacing the creation of new tasks requires the three levers to work together. Education must equip workers to perform new tasks alongside AI, industrial policy must plan for those tasks sector by sector, and fiscal incentives must reward firms that create them. AI is already knocking at South Africa's door; whether it enters as a substitute for workers or as a partner to them will be decided not by the technology itself, but by policy.

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