How should South Africa redesign education, industrial policy, and fiscal incentives to harness artificial intelligence for productivity growth while limiting labour market disruptions?

Postgraduate entry ***Word count: 3518***

1. Introduction

The purpose of AI systems is to automate tasks, handle the scale of different projects, and augment human decision-making. Statistics South Africa (2026) indicated that in Q2, the labour market was characterised by an unemployment rate of 33.6% and a youth unemployment rate of roughly 47.4%. The factors in the systems' contribution reflect the AI approaches that substitute for labour or complement it. This essay argues that AI's productivity potential in South Africa can only be achieved through the coordinated redesign of education, industrial policy, and fiscal incentives, with employed labour being placed at the centre.

Park (2018) argues that the 4th Industrial Revolution has been intensely driving automation, and exposure to it depends more on the type of work performed than on the skill of the worker. AI aims to reduce costs and boost productive capabilities, thus putting pressure on firms to innovate and create value. Acemoglu and Restrepo (2019) differentiate between automation and new tasks. They argue that automation results in a displacement effect, but the new tasks that are created can offset the displacement effect. The outcome for employment is therefore not automatic; it depends on whether policy captures the offset, rather than leaving it to the market.

If productive employment is low, economic direction has to be steered by industrial policy. While AI's productivity gains alone cannot be the only solution to the unemployment problem in South Africa, coordinated policy can leverage AI's productivity gains while targeting the highest attainable level of employment. The value of AI to productivity needs to be calculated, and the productivity benefits weighed against the resulting disruption to the labour market. The government should be concerned with how limited fiscal resources can be used to encourage AI investment that leads to productivity growth and labour-market benefits. The fiscal matter is essential because South Africa should not simply support and subsidise AI adoption without considering the opportunity costs.

This essay will be a theoretical evaluation of the impact of AI on the labour market, its effects on productivity, and how AI's implementation can be driven through policymaking.

2. Harnessing AI

The policy challenge is how to transition to AI while generating substantial productivity gains without causing significant labour market disruption. This essay evaluates education policies that build the labour force to complement AI, industrial policy instruments that steer where and how labour capacity is deployed, and fiscal policy measures that can influence whether firms adopt AI and the labour implications that follow. A final section brings these three together, reflecting on how they can reinforce or constrain each other.

2.1. Education

This section argues that education policy should shift from training workers for jobs that are being taken by AI to jobs that are being augmented by AI, addressing curriculum design and unequal access to the infrastructure on which education depends. It is not just about the traditional education system, but also about reskilling and upskilling programmes, lifelong learning and identifying skills gaps to future-proof industries and evolving labour markets. Papaneophytou and Nicolau (2026) argue that currently, educational curricula promote tasks that are achievable with the existing AI systems. They also claim that the education system has a structural problem that produces outcomes based on knowledge reproduction. Judgment and justification, on the other hand, would characterise distinctly human characteristics.

The task is to develop curricula so that students at all levels of traditional education can use artificial intelligence to think critically, solve problems, and be innovative. Exposing students to automation should be clearly communicated at each level of education, with a focus on the tasks that AI can already perform faster and more consistently than humans, as well as those that still require human judgment.

Education should also strive towards the identified industries, which will need people who can manipulate AI to augment it. South Africa should not assume that AI literacy is reserved for academic or digital occupations. But practical, technical, and vocational skills remain relevant because exposure to AI varies across tasks and/or occupations. Therefore, it is crucial that Technical and Vocational Education and Training (TVET) institutions are well-resourced to deliver AI-relevant technical training. Artificial Intelligence alters how jobs are done and where human judgment is required. Thus, education must equip people with multiple skills for complementary labour. Aila (2026) argues that AI presents opportunities

to enhance learning and development in TVET institutions and that, rather than being a technology that replaces humans, AI is a tool for human empowerment.

Digital inequality factors in here, as South Africa has one of the highest levels of inequality in global income distribution, with a GINI coefficient of 0.541 (World Bank, 2022), leading to unequal access to technology and exposure to artificial intelligence. The OECD Teaching and Learning International Survey (2024) found that 75% of teachers said their schools lack the infrastructure to use AI. Statistics South Africa's General Household Survey (2025) found that 17.6% of households in urban areas have access to the internet at home compared to only 2.7% in rural areas. If the infrastructure isn't evenly distributed, the development of skills that can complement AI will not be either. This leads to the technologically equipped acquiring AI-complementary abilities, while the labour market absorbs already tech-savvy people.

Another source of concern in education is its lack of digital readiness. Students should not enter higher education studies needing to learn basic digital literacy while simultaneously being expected to use advanced digital tools for learning.

Banquez-Maturana (2026) argues that the consequences of AI are less a matter of their technical capabilities than they are of the pedagogical, organisational, and cognitive circumstances in which they are applied. Education creates the human capability necessary for AI adoption to generate productivity gains rather than simply displacement. The next policy challenge is to determine where the capacity should be applied in the economy.

2.2. Industrial policy

This section argues that industrial policy must shift AI adoption towards productivity-enhancing uses that create demand for complementary labour, rather than reinforcing existing concentration. The Minister of Science, Technology and Innovation, Dr Blade Nzimande, speaking at a Policy Dialogue on Industrialisation (DSTI, 2026), described innovation as the introduction and dissemination of new products, processes and methods. Nzimande also urged South Africa to work faster on upgrading its technological infrastructure in its main industries to generate and maintain jobs and increase its competitiveness in the global economy. He then argued for stronger coherence among industrial policy, skills development, and investment, which are needed for industrialisation in South Africa. This is a crucial step towards AI policy: technological improvement must align with skills and investment needs to have an impact on productive capacity and job creation.

AI adoption is already creating opportunities for productivity growth within South Africa. Multinational corporations such as Google, Amazon Web Services, and Microsoft have been among those that have increased the presence of AI systems in South Africa as they seek to enter or strengthen market share on the African continent. These applications allow firms that purchase AI services to streamline analytics, reduce operational costs, detect fraud, and automate financial processes. However, the benefits of AI-driven productivity can also disrupt the labour market through the automation of tasks traditionally done by workers. A World Economic Forum (2025) report suggests that 41% of employers plan to reduce their workforce due to the effects of automation. The policy question asks how industrial policy can shift the direction of AI adoption to promote productivity-enhancing uses that increase productive capacity, but not labour displacement.

Traditional approaches to industrial policy tend to focus on the identification of key sectors or companies and supporting them through protection, subsidies, or other direct policy measures. AI-oriented industrial policy aims to cultivate the skills, infrastructure, and conditions for companies to discover and implement productive AI deployments. But a new policy could fail to address the shortcomings of traditional policy if the government identifies favoured firms and protects them, so the government should create an environment in which firms can experiment with AI and compete in terms of productivity. Cerutti et al. (2025) argue that the productivity gains driven by AI are concentrated in the advanced economies. They attribute this to variations in exposure to AI and readiness, such as superior infrastructure and data access. This implies that market forces alone would not dictate the full adoption of AI in South Africa. Industrial policies need to focus on capacities and infrastructure that limit uptake.

A newly designed AI policy should be implemented first in industries where South Africa has productive capabilities. Nzama et al. (2024) found that the adoption of AI in the manufacturing industry yielded positive results across various competencies. Lessons from this deployment can be utilised in AI adoption by less-developed industries, supporting productivity gains, cost reductions, and competitiveness more broadly. Gaglio et al. (2022) studied the effects of digitalisation on small and micro enterprises and found that the use of selected digital technologies has a positive effect on labour productivity. But industrial policy should not merely be a reinforcement of the existing economic concentration. The government should also leverage AI adoption for nurturing new industries, firms, and economic hubs. The goal should therefore be to shift from the adoption of AI within existing industries to the development of new productive activities that create new demand for AI-complementary labour. However, if the use of AI can only increase productivity without a reinstatement effect, there could still be a decrease in job opportunities. Productivity gains

are a key tool in a strong industrial policy to grow output, increase competition, and develop new industries. An article by Microsoft (2025) reports that since the adoption of Microsoft 365 Copilot, the Public Investment Corporation (PIC) has been able to assess and approve investments in 6 months instead of 12, and shared that employees could now take 2 hours instead of 2 days to prepare presentations and 2 hours instead of a month to create surveys. AI, then, should be used to develop workers with skills that are complementary to AI itself and to create sufficient productive opportunities, determined by industrial policy.

The cost of AI-driven industrialisation of resources and infrastructure must be taken into consideration in industrial policy. The water and electricity consumption of data centres and AI infrastructure can be significant, adding pressure on economies facing infrastructure and water shortages. Masanet et al. (2020) estimated the share of global electricity consumption by data centres to be approximately 1%. The drive towards industrialisation should therefore not be achieved at the cost of resources necessary for households and other productive sectors. Policy should encourage innovation which improves the efficiency of electricity and water usage. It should also go beyond productivity and employment objectives to cover the fiscal, environmental, and infrastructural expenses of adoption.

While industrial policy can influence the use of AI, it won't ensure that companies make the necessary investments to adopt AI technologies. The next policy question is what government fiscal incentives should look like when it comes to promoting productive investment in AI, and how to achieve the desired levels of productivity and labour market benefits with a limited public purse.

2.3. Fiscal incentives

This section argues that the nature of the tax and spending policies the government offers to firms can be decisive in determining the level of investment in AI and productivity growth. The concurrent issue with investment in AI is the value of labour that is displaced as a result. The government's focus should not only be on preserving the existing labour market but also on encouraging firms to increase their use of complementary labour in the application of AI. Labour-market displacement does not have to be positively correlated with productivity growth. Brollo et al. (2024) propose the creation of a policy to facilitate innovation and deployment to benefit collective human interests by leveraging the transformative power of generative AI.

AI is evolving quickly, and efforts are being made to invest in research and development to remain ahead of the curve in technological advancements. But firms need to be able to employ their labour in a manner that supports technological and productivity improvements.

Fundamental drivers of private investment in AI are a firm's interests in its growth and profitability. The government should align this interest with broader economic targets by providing fiscal policy incentives that stimulate productivity growth and do not displace labour. To support this, Kahn et al. (2022) found that firms receiving public financial support have higher percentages of skilled employees and higher expenditures on innovation.

The South African Revenue Service (2026) confirms that businesses registered in South Africa with an annual payroll above R500 000 are liable for contributions to the Skills Development Fund via the Skills Development Levy. A substantial portion of these levy funds should be redirected toward AI-complementary skills training. Businesses should assess the impact of this fund on their own operations and report on its effects. Beyond the levy, grant support for entrepreneurs should be objective-based, with productivity highlighted as a key metric.

Rethinking fiscal incentives to focus on production expansion and restrict the risk of job losses should be developed in consultation with employers. Companies need to explain the difficulties and successes they have encountered with incorporating AI into their operations. Policymakers can draw on this evidence to establish a compelling incentivisation structure that promotes productivity gains for South African firms, and helps to maintain employment and curb labour-market losses. This would enable incentives to adjust to the conditions on the ground for firms instead of assuming that a single incentive will be applicable to all industry sectors. Liu et al. (2026), in their study on China's Supply Chain Innovation and Application (SCIA) policy, found that a policy-induced investment surge was driven by different fiscal levers depending on firm characteristics. This supports the claim that a one-size-fits-all approach would not be effective.

The government imposing taxes on the use of AI would be like taxing companies that adopt more efficient production processes. The tax on the adoption of AI can discourage productivity-enhancing investment and incentivise companies to delay new technology. Brollo et al. (2024) comment on the widespread proposal to levy taxes on automation to prevent its use exceeding a certain threshold. The case supporting taxation may not be as convincing in the long run, as Beraja and Zorzi (2024), cited in Brollo et al. (2024), pointed out. If the tax base is limited, then additional taxes might further constrain productivity and investment. The goal should not be to impose any special tax on the use of AI itself, but to design fiscal incentives that encourage firms to invest in AI that brings positive returns.

The Employment Tax Incentive (ETI), a tax incentive available to South African employers who hire young job-seekers and pay employees below a certain salary threshold (South African Revenue Service, 2026), is particularly relevant given South Africa's youth unemployment rate of 47.4% (Statistics South Africa, 2026). Programmes of this kind can

assist in maintaining youth employment during the transition caused by AI. In BusinessTech (2026), it was reported that the South African Revenue Service had cracked down on companies claiming ETI benefits without actually providing employment, highlighting the dangers of hiring on paper. This is a risk AI incentives should avoid: companies need to prove that they have created and filled jobs for the youth. The government can also act directly as an employer of AI-skilled youth, applying their skills within public institutions. This not only strengthens state capacity and boosts employment but also enables the use of AI in the public sector, and thus the creation of jobs for those with new skills.

Thus, the goal of fiscal redesign is not just to reduce the cost of investment in AI, but to increase the attractiveness of productive, labour-complementary AI investment.

2.4. The policy nexus

This section argues that while education, industrial policy, and fiscal incentives can reinforce one another, they also compete for limited fiscal space. The tripartite coordination and sequencing determine whether AI's productivity gains can keep labour at the centre of policy redesign. Policy measures for education, industrial policy, and fiscal incentives should not be independent but form a reinforced policy package. Skilled workers who match the requirements of AI-complementarity are developed through education; industrial policy creates the productive opportunities for AI to be used where these skills can be applied; and fiscal incentives affect whether firms invest in AI together with complementary labour.

This internal loop may become constraining when education, industrial policy and fiscal incentives vie for the same rand. Cerutti et al. (2025) highlighted that productivity gains are concentrated in advanced economies, which may suggest that it is harder to allocate more resources to each policy. The implication is that investment flows to where returns are higher, making it harder for a developing economy like South Africa to attract sufficient level of AI investment. All governments have a budget, and each department competes for amounts to be granted to it. When all three policies are at loggerheads, the objective should be to pursue an industrial policy that generates more gains to be reinvested in the other, less-funded policy.

The education system should produce AI-skilled labour that can boost firm productivity. However, the skills acquired through education should be related to the productive activities required by the market. The goal is not to direct how firms should apply AI, but to make investment in AI and complementary labour economically viable. In the South African context, a core issue related to any policy mechanism is the 47.4% youth unemployment

rate. The implemented policy has to reflect the target job creation, reinstatement effects after AI adoption, and reskilling of existing labour.

This framework works well if the productivity of firms increases when they use AI in combination with human labour. A rise in competitiveness or firm-level productivity, without displacing more labour from the market, results in broader economic benefits of the incentives.

There should be short-term, medium-term and long-term goals for education, industrial policy and fiscal incentives that can be evaluated to see how effective they are. The government should then model their policy interventions against the outcomes. This makes the applied interventions not just productivity mechanisms, but rather, productivity that creates or maintains employment.

3. Recommendations

This section recommends sequencing AI policy around industrial policy as the first priority for redesign, with education and fiscal incentives integrated into its directive. Industrial policy can signal to markets where the country wants to go. Should a policy be targeted solely at education, then South Africa might end up with skilled individuals with no infrastructure to absorb them. Should the policy preference be given to fiscal incentives, South Africa may end up with businesses that require AI-skilled individuals that the labour market cannot supply, thereby necessitating the importation of skills, while the unemployment rate maintains its current trajectory. This does not mean that education and fiscal incentives wait for industrial policy to be complete; their design should align with the directive set by industrial policy. Operation Vulindlela (2026) demonstrates that South Africa is investing in the digital foundations required for the AI future; although the reforms are ongoing and productivity outcomes are not yet measurable, the programme signals the government's intention to integrate AI into the current systems.

With industrial policy placed at the centre, it would create a system that draws on the environment created to drive labour demand. Education would be designed to address skills shortages, and its objectives would be reviewed against short-term, medium-term, and long-term targets. Fiscal incentives like the ETI would therefore be employed for sectors where demand is high, but funding may be low. Industrial policy identifies where returns are highest first, and those returns can be partly reinvested to fund education or fiscal incentives, resolving budget competition. A revised ETI programme would also be the place to design an approval process that directly tracks whether an individual is employed under that regulation.

4. Conclusion

South Africa's unemployment crisis, at 33.6% overall and 47.4% among the youth, should motivate a coordinated approach to integrating artificial intelligence while keeping labour at the centre. AI-driven redistribution alone cannot fix the unemployment crisis. What can is an integrated approach that requires AI capacity-building in education, an industrial policy that drives investment in AI adoption for productivity enhancement, and fiscal incentives that make the hiring of AI-skilled labour attractive. Education, industrial policy, and fiscal incentives are meant to reinforce one another in this policy redesign; however, they may end up competing for the same rands from government.

Industrial policy should signal the direction envisioned by the government for AI, with education and fiscal incentives then calibrated to that directive. By identifying where returns are highest, industrial policy creates revenue and knowledge that policymakers can reinvest in education and fiscal incentives. Selecting industrial policy as the lead directive does not mean that education and fiscal incentives lie dormant while industrial policy is active. The sequencing should allow for the concurrent implementation of policy actions, with a highlighted focus on the directive from industrial policy. Crucially, developing a policy that enhances firm or labour productivity while creating or maintaining employment is the ultimate goal of this policy package.

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