

ENTRY NO. 1619

Inclusive Productivity: How South Africa Can Redesign Education, Industrial Policy and Fiscal Incentives to Harness Artificial Intelligence Without Deepening Unemployment?

(3,136 words)

TABLE OF CONTENTS

1. Introduction	3
2. South Africa's Challenge	3
3. The Central Economic Argument: Productivity Must Connect to Demand	4
4. Education Policy: Connect Training to Employment.....	5
4.1 Pay for Employment Outcomes	5
4.2 Use AI to Support Apprenticeships	5
4.3 Strengthen Foundational Literacy	6
5. Industrial Policy: Target Sectors with Unmet Demand.....	6
5.1 Prioritise Productive Opportunities.....	6
5.2 Buy Solutions to Public Problems	7
5.3 Help SMEs Adopt AI	8
5.4 Make Industrial Support Accountable	8
6. Fiscal Incentives: Reward Productivity and Responsible Transitions.....	8
6.1 Review the Tax Treatment of Labour and Capital	8
6.2 Introduce a Conditional Augmentation Allowance	9
6.3 Share the Costs of Displacement	9
6.4 Reprioritise Existing Expenditure	9
7. Protect Workers and Support Transitions.....	10
8. International Lessons	10
9. Implementation and Evaluation.....	11
10. Risks and Limitations	11
11. Conclusion	12
List of References	13

1. Introduction

Artificial intelligence (AI) could help South Africa raise productivity, improve public services and develop new industries. However, these gains will not automatically translate into employment or better living standards. In an economy facing persistent unemployment, the central challenge is not only preparing workers for technological change, but also ensuring that enough productive firms and economic opportunities exist to employ them.

Conventional policy responses emphasise digital skills, retraining and tax incentives. These measures are necessary but incomplete. Training workers for jobs that do not exist cannot resolve unemployment, while firms can increase productivity by replacing workers without expanding their output sufficiently to create new jobs.

This essay argues that South Africa should pursue **inclusive productivity**: using AI to increase productive capacity while expanding economic opportunities and managing the costs of technological change. Its central proposal is to design skills development and job creation together. Education policy should prepare workers for identifiable opportunities, industrial policy should direct AI towards sectors with unmet demand, and fiscal incentives should reward measurable productivity gains alongside credible workforce-transition plans.

Productivity growth does not automatically create employment. Jobs expand when lower costs generate additional demand, new tasks emerge, or firms reinvest gains in expanding production. South Africa must therefore consider not only whether AI improves efficiency, but also where it is deployed and whether the resulting gains create opportunities for workers.

2. South Africa's Challenge

South Africa's high unemployment, weak foundational learning, uneven business capabilities and limited fiscal space make an inclusive AI strategy particularly important.

First, unemployment is not simply a skills shortage. It also reflects the economy's limited capacity to absorb available labour into productive employment. Training can improve employability, but investment, enterprise development and expanding markets are needed to increase the number of opportunities available.

Second, advanced skills depend on basic education. The 2021 Progress in International Reading Literacy Study found that approximately four in five South African Grade 4 learners could not read for meaning (Department of Basic Education, 2023). AI training cannot compensate for weak literacy and numeracy, which workers need to understand information, evaluate outputs and exercise judgement.

Third, small and medium-sized enterprises (SMEs) often lack the finance, management expertise and technical capacity to adopt AI effectively. Access to software alone will not guarantee productive use. Weak capabilities among smaller suppliers can also constrain productivity throughout supply chains.

Fourth, AI could threaten entry-level administrative and clerical work. These jobs provide young people with experience and a pathway into employment. Losing them without creating alternatives risks longer periods of unemployment and lasting damage to future employability, known as labour-market hysteresis (Blanchard & Summers, 1986).

Finally, public funding is constrained. National Treasury reported that debt-service costs were projected to reach 21.3% of revenue in 2025/26 (National Treasury, 2026). AI policy must therefore prioritise interventions that demonstrate value rather than introduce unlimited subsidies.

These problems reinforce one another: weak learning limits skills, weak firms restrict productive opportunities, and limited job creation reduces the return on training.

3. The Central Economic Argument: Productivity Must Connect to Demand

AI can automate tasks previously performed by people or augment workers by helping them perform existing tasks more effectively. The same technology can produce either outcome.

When AI lowers production costs, firms may reduce prices and sell more. If demand responds strongly to lower prices, higher output can offset some labour displacement. Economists describe this as price elasticity of demand. Where demand is already satisfied or responds weakly to lower prices, firms may instead produce the same output with fewer workers.

Employment can also grow when new tasks emerge. AI may automate data entry while increasing demand for workers who verify outputs, maintain systems, interpret results or manage customer relationships. Acemoglu and Restrepo (2019) describe this as the creation of new tasks in which human labour retains an advantage.

A third possibility is reinvestment: firms use productivity gains to expand capacity, develop products or enter new markets. However, they may instead retain the gains or invest in further automation. Job creation is therefore possible, not guaranteed.

This essay proposes a **Four-Test Augmentation Screen** to guide public support for AI projects:

1. **Productivity:** Does the investment raise value added per worker, rather than simply reduce costs?
2. **Demand:** Is there evidence that improved quality, lower prices or wider access can expand demand?

3. **New tasks:** Will the investment create or preserve meaningful human tasks?
4. **Shared gains:** Are affected workers able to benefit from productivity gains or receive credible transition support?

Projects passing these tests would qualify for enhanced support, other investments could still proceed but would receive only standard, capped treatment. The screen does not prohibit automation. It distinguishes private investment from projects that deserve additional public support because they offer wider economic benefits.

4. Education Policy: Connect Training to Employment

4.1 Pay for Employment Outcomes

Training programmes should be judged by whether graduates secure and retain suitable employment, not simply by enrolment or certificates. A meta-analysis found that labour-market training often has modest short-term effects but stronger medium-term effects, making follow-up essential (Card et al., 2018).

Sector Education and Training Authorities (SETAs) should pilot outcome-based contracts with Technical and Vocational Education and Training (TVET) colleges and accredited private providers. A minority of funding would be paid at enrolment, with the remainder linked to verified employment at six and twelve months. Employers would help design courses and commit to workplace placements before programmes receive funding.

Payments should be weighted towards learners who face greater employment barriers. Otherwise, providers could improve their results by selecting applicants who are easiest to place. Employment quality, earnings and retention should also be tracked.

This design addresses a principal–agent problem: government funds training but cannot easily observe its quality. Paying for verified outcomes gives providers stronger incentives to deliver useful skills.

4.2 Use AI to Support Apprenticeships

AI could help restore entry-level opportunities by allowing inexperienced workers to complete routine tasks while learning from experienced colleagues. A study of customer-support agents found that an AI assistant increased issues resolved per hour by about 14% on average, with larger gains among less-experienced workers (Brynjolfsson et al., 2023).

South Africa could pilot **AI-assisted apprenticeships** in bookkeeping, customer support, logistics and selected administrative occupations. Apprentices would use AI for routine drafting and information retrieval while receiving human supervision and structured workplace learning.

Training should emphasise verification, critical thinking, privacy and professional judgement, not just the use of AI tools. Research suggests that AI can improve performance on tasks within its capabilities but may mislead users when applied beyond them (Dell’Acqua et al., 2023).

4.3 Strengthen Foundational Literacy

A national AI-skills strategy must begin with effective reading and numeracy instruction. AI should assist teachers rather than replace them.

Government could pilot low-bandwidth tools that support reading practice in local languages and help teachers identify learners needing additional support. Trained unemployed young people could work as reading assistants through school-support programmes, creating employment while supporting learning.

Investment should prioritise reliable electricity, teacher support, maintenance and suitable materials before large-scale device procurement. Educational technology can improve learning when appropriately designed, but simply providing devices does not guarantee better outcomes (Escueta et al., 2020).

AI-assisted literacy complements, but cannot replace, broader improvements in basic education. Pilots should expand only when independent assessments demonstrate learning gains.

5. Industrial Policy: Target Sectors with Unmet Demand

The essay’s most distinctive recommendation is to direct AI towards sectors where productivity gains could help meet unmet demand. This will not guarantee more jobs, but it increases the likelihood that improved efficiency can support expanding output rather than simply reduce labour requirements.

5.1 Prioritise Productive Opportunities

Primary healthcare: AI-assisted triage, administrative support and clinical decision tools could help nurses and community health workers serve more patients. Professional oversight must remain, and improved capacity will create employment only if funding and patient access allow services to expand.

Municipal services: AI could identify water leaks, electricity losses and maintenance needs. Better monitoring could improve service delivery and create work for technicians and field teams. However,

technology cannot replace adequate infrastructure, maintenance budgets or sound municipal management.

Agriculture and agro-processing: AI-assisted disease detection, grading and traceability could reduce losses, improve product quality and help exporters meet buyer requirements. If these improvements expand sales, additional work may emerge in processing, packaging and logistics.

Logistics and ports: Better scheduling and predictive maintenance could reduce delays affecting exporters across the economy. Employment benefits would depend on whether improved efficiency generates higher trade volumes and investment.

Informal enterprises: Affordable voice- and messaging-based tools could help spaza shops, taxi associations and small service providers manage stock, pricing and bookkeeping. Lower transaction costs may improve business survival and access to finance.

By contrast, routine back-office automation in markets where demand is already satisfied may displace workers without generating much additional activity. Such investments should not be banned, but they should not automatically receive the most generous employment-oriented subsidies.

A Labour Market and AI Observatory should estimate occupational exposure, emerging tasks and sector demand. Estimates will be imperfect, so the evidence should inform and adapt policy rather than determine rigid lists of permitted technologies.

5.2 Buy Solutions to Public Problems

Government procurement can create markets for local innovation without attempting to predict which firms will succeed. Under **advance market commitments**, departments would define a public problem and promise payment if a solution achieves independently verified results.

For example, a municipality could invite competing firms to develop a system that reduces water losses, with payment tied to measured improvements.

This approach rewards outcomes rather than promises. Selection criteria should be transparent, and local capability should be valued where it offers measurable benefits such as local-language performance, data protection or maintainability. Independent verification and clear exit conditions would reduce waste and favouritism.

5.3 Help SMEs Adopt AI

Smaller firms need practical guidance as well as access to technology. Regional **AI Adoption Centres** at TVET colleges and universities of technology could help businesses identify suitable applications, test tools and train staff. Student–business projects could provide learners with experience while helping firms implement technology.

Shared computing credits and pre-approved software options could reduce costs. Support should focus on applications with plausible business returns rather than encouraging firms to adopt AI for its own sake.

Government should also support shared datasets in official languages and priority sectors, subject to the Protection of Personal Information Act and appropriate consent and privacy safeguards. Specialised capabilities in African-language AI and sector-specific applications may offer South Africa more realistic opportunities than attempting to compete directly with global developers of general-purpose AI models.

5.4 Make Industrial Support Accountable

Industrial policy risks favouring politically connected firms or continuing to fund unsuccessful projects. Awards should therefore use published criteria, independent assessment and staged funding. Firms should report measurable productivity, sales, employment and training outcomes.

Programmes should have spending caps and automatic expiry dates. Support should stop when projects repeatedly fail to meet agreed milestones. This follows the principle that public assistance should create obligations to demonstrate performance, not permanent entitlements (Amsden, 1989, Rodrik, 2004).

6. Fiscal Incentives: Reward Productivity and Responsible Transitions

6.1 Review the Tax Treatment of Labour and Capital

Tax rules influence firms' choices between workers and machinery. If equipment and software receive more favourable treatment than labour, firms may automate even when the wider social benefits are limited. Research on the United States identifies tax-induced incentives favouring automation (Acemoglu et al., 2020). South Africa should establish whether a comparable bias exists before designing new subsidies.

National Treasury and the South African Revenue Service (SARS) should conduct an effective-tax-rate review comparing the treatment of labour, equipment and software. The objective should be greater neutrality, avoiding unnecessary incentives to substitute machines for workers.

6.2 Introduce a Conditional Augmentation Allowance

A two-tier allowance could distinguish ordinary investment from AI projects that demonstrate wider public value.

Tier 1 would provide capped, clearly defined tax treatment for qualifying AI investment. **Tier 2** would provide an additional deduction, earned over three years only when a firm demonstrates improved value added per worker and submits a credible workforce-transition plan.

A multi-year assessment recognises that new technologies may require complementary investment and organisational learning before productivity gains become visible. Performance should be compared with suitable firms, accounting for sector and size. Transition plans should identify changing roles, opportunities for redeployment and training requirements.

Small firms should receive simplified applications and advice through AI Adoption Centres. The allowance should include expenditure caps, clawbacks for false claims, independent evaluation and a sunset date. This limits fiscal exposure and helps distinguish additional investment from activity that would have occurred without public support.

6.3 Share the Costs of Displacement

When AI causes substantial net job losses, some costs fall on workers, households and the state rather than on the firm making the investment. This is a negative externality.

Larger firms undertaking significant AI-related workforce reductions could be required to choose among credible redeployment, accredited retraining or contributions to a transition fund. Smaller firms should face exemptions or lighter requirements to avoid discouraging growth. The system should be phased in and evaluated to reduce incentives to avoid the rules.

The aim is not to penalise automation itself, but to ensure that firms benefiting from technological change contribute to managing foreseeable transition costs.

6.4 Reprioritise Existing Expenditure

South Africa cannot afford overlapping technology programmes with unclear results. Existing innovation grants, training funds and technology-transfer initiatives should be reviewed and consolidated where they duplicate one another.

A transparent funding window could support projects passing the Augmentation Screen. Each programme should have a defined objective, maximum budget, measurable indicators and an evaluation date. Successful initiatives could expand, while ineffective ones should close.

The Employment Tax Incentive illustrates why evaluation matters: research found no statistically significant average effect on youth employment (Ebrahim et al., 2017). New incentives should be tested against alternatives, not treated as permanent entitlements.

7. Protect Workers and Support Transitions

Some workers will lose their jobs even under an inclusive strategy. Policy should make transitions less damaging rather than promise that every existing job can be preserved.

Temporary wage insurance could help workers who accept a new job paying less than their previous one. The scheme would cover part of the difference for a limited period, subject to verified employment, a cap and a clear end date. It could make re-employment more attractive while helping workers remain connected to the labour market. Any use of unemployment-insurance resources would require an actuarial assessment and confirmation of legal and financial sustainability.

Sector bargaining councils should develop agreements covering notice of major AI deployments, consultation, redeployment and the sharing of productivity gains. Firms seeking the enhanced tax allowance should disclose workforce plans during relevant consultations. Requirements must remain proportionate: evidence from South Africa suggests that extending centralised bargaining agreements to smaller businesses can reduce employment in some industries (Magruder, 2012).

The Observatory should publish regular assessments of changing occupations, emerging skills and sector demand, helping workers, employers and colleges respond to evidence rather than assumptions about which jobs AI will eliminate.

8. International Lessons

International experience offers useful principles, but South Africa must adapt them to its institutions and fiscal constraints.

Singapore's support for approved digital solutions illustrates how government can lower SMEs' search costs. South Africa could adopt pre-approved options while offering extra guidance to less digitally capable firms.

Germany's dual apprenticeship model combines classroom and workplace learning. South Africa could adopt employer co-design and practical placements, while recognising that the system cannot scale without firms willing to train learners.

South Korea demonstrates the value of tying public support to performance. The lesson is to withdraw support when results are poor, rather than reproduce a model associated with concentrated corporate power.

India's digital public infrastructure illustrates how shared systems can reduce transaction costs and enable private innovation. South Africa could develop shared language resources and sector tools, with privacy safeguards and alternatives for people without reliable digital access.

A common warning emerges: training alone does not guarantee employment. Evaluations of the United States' Trade Adjustment Assistance programme found that participants earned less than comparable non-participants four years later, reinforcing the importance of matching training to real labour-market opportunities (Schochet et al., 2012).

9. Implementation and Evaluation

Years 1–2: Establish the Observatory, review the tax treatment of labour and capital, and pilot outcome-based training at selected TVET colleges. Employers must commit to placements before training begins. Pilot AI-assisted reading support and a small number of procurement challenges in healthcare or municipal services.

Years 3–5: Expand programmes that demonstrate credible productivity or employment gains. Introduce the conditional Augmentation Allowance and transition obligations for larger firms, alongside a wage-insurance pilot if fiscal and legal assessments support it. Expand AI Adoption Centres where evaluations show benefits.

Years 5–10: Scale successful interventions, deepen specialised capabilities in local-language and sector-specific AI, and revise incentives based on observed outcomes.

Evaluation should measure employment and earnings after training, job retention, value added per worker, SME adoption, output growth and outcomes for displaced workers. Where feasible, participants should be compared with similar non-participants to establish whether public support caused the observed improvements.

10. Risks and Limitations

Sector demand is difficult to predict, and AI capabilities change quickly. The Observatory should therefore inform decisions without creating rigid forecasts. Firms may manipulate productivity measures or submit transition plans that exist only on paper. Independent verification, clawbacks and expiry dates can reduce these risks but not eliminate them.

Worker protections also involve trade-offs. Excessively costly obligations could discourage investment, particularly among SMEs. Some automation is necessary for competitiveness, the goal is not to prevent displacement but to improve the balance between productivity gains and social costs.

Finally, AI cannot resolve every constraint on growth. Electricity reliability, transport infrastructure, municipal capacity, competition and basic education remain essential. AI policy should complement these foundations, not divert resources from them.

11. Conclusion

South Africa's AI challenge is not simply to produce more digitally skilled workers. It is to build an economy with enough productive firms, expanding markets and new tasks to employ them. Training disconnected from job creation risks producing qualified jobseekers without improving employment. Technology adoption disconnected from demand risks raising productivity in individual firms while deepening unemployment elsewhere.

An integrated strategy would link training funding to employment outcomes, use AI to support apprenticeships and foundational learning, and direct industrial policy towards sectors with unmet demand. Fiscal incentives would reward measurable productivity gains and responsible workforce transitions, while wage insurance would help displaced workers return to employment.

The central principle is that productivity and employment must be designed together. Government cannot guarantee that every AI project will create employment, but it can influence which projects receive public support and ensure that the costs of technological change are not borne entirely by workers.

The test of AI policy is not how quickly technology is adopted, but whether it raises productivity while expanding opportunity. For South Africa, inclusive productivity means using AI not only to help firms produce more, but also to build the productive capacity needed to give more people a meaningful place in the economy.

List of References

- Acemoglu, D., Manera, A., & Restrepo, P. (2020). Does the U.S. tax code favor automation? *Brookings Papers on Economic Activity*, Spring, 231–285.
- Acemoglu, D., & Restrepo, P. (2019). Automation and new tasks: How technology displaces and reinstates labor. *Journal of Economic Perspectives*, 33(2), 3–30.
<https://doi.org/10.1257/jep.33.2.3>
- Amsden, A. H. (1989). *Asia's next giant: South Korea and late industrialization*. Oxford University Press.
- Blanchard, O. J., & Summers, L. H. (1986). Hysteresis and the European unemployment problem. *NBER Macroeconomics Annual*, 1, 15–78.
- Brynjolfsson, E., Li, D., & Raymond, L. R. (2023). *Generative AI at work* (NBER Working Paper No. 31161). National Bureau of Economic Research. <https://doi.org/10.3386/w31161>
- Card, D., Kluve, J., & Weber, A. (2018). What works? A meta-analysis of recent active labor market program evaluations. *Journal of the European Economic Association*, 16(3), 894–931.
<https://doi.org/10.1093/jeea/jvx028>
- Dell'Acqua, F., McFowland, E., III, Mollick, E. R., Lifshitz-Assaf, H., Kellogg, K. C., Rajendran, S., Kraymer, L., Candelon, F., & Lakhani, K. R. (2023). *Navigating the jagged technological frontier: Field experimental evidence of the effects of AI on knowledge worker productivity and quality* (Harvard Business School Technology & Operations Mgt. Unit Working Paper No. 24-013).
<https://doi.org/10.2139/ssrn.4573321>
- Department of Basic Education. (2023). *PIRLS 2021: South African preliminary highlights report*. Department of Basic Education.
- Ebrahim, A., Leibbrandt, M., & Ranchhod, V. (2017). *The effects of the Employment Tax Incentive on South African employment* (WIDER Working Paper 2017/5). UNU-WIDER.
<https://doi.org/10.35188/UNU-WIDER/2017/229-8>
- Escueta, M., Nickow, A. J., Oreopoulos, P., & Quan, V. (2020). Upgrading education with technology: Insights from experimental research. *Journal of Economic Literature*, 58(4), 897–996.
<https://doi.org/10.1257/jel.20191507>

- Magruder, J. R. (2012). High unemployment yet few small firms: The role of centralized bargaining in South Africa. *American Economic Journal: Applied Economics*, 4(3), 138–166.
<https://doi.org/10.1257/app.4.3.138>
- National Treasury. (2026). *Budget review 2026*. Government of South Africa.
<https://www.treasury.gov.za/documents/National%20Budget/2026/review/FullBR.pdf>
- Rodrik, D. (2004). *Industrial policy for the twenty-first century* (KSG Working Paper No. RWP04-047). Harvard Kennedy School.
- Schochet, P. Z., D'Amico, R., Berk, J., Dolfin, S., & Wozny, N. (2012). *Estimated impacts for participants in the Trade Adjustment Assistance (TAA) program under the 2002 amendments*. Mathematica Policy Research.