SA-TIED

Southern Africa – Towards Inclusive Economic Development

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Education, inclusive growth, and fiscal consolidation

*Peter Courtney

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About the project

Southern Africa – Towards Inclusive Economic Development (SA-TIED)

SA-TIED is a unique collaboration between local and international research institutes and the government of South Africa. Its primary goal is to improve the interface between research and policy by producing cutting-edge research for inclusive growth and economic transformation in the southern African region. It is hoped that the SA-TIED programme will lead to greater institutional and individual capacities, improve database management and data analysis, and provide research outputs that assist in the formulation of evidence-based economic policy.

The collaboration is between the United Nations University World Institute for Development Economics Research (UNU-WIDER), theNational Treasury of South Africa, the South African Revenue Services, and other universities and institutes. It is funded by the National Treasury of South Africa, the Delegation of the European Union to South Africa and UNU-WIDER through the Institute's contributions from Finland, Sweden, and the United Kingdom to its research programme.

* Department of Economics, University of Stellenbosch and School of Business and Economics, Vrije University, Amsterdam, Netherlands, p.sr.courtney@gmail.com.

Abstract: This report explores strategies for improving education outcomes in South Africa, with a view to strengthening economic growth and employment over the long run. It argues that the key to more rapid educational progress—both in the quality of schooling broadly considered and in expanding higher education outcomes—is foundational literacy and numeracy. A special focus is proposed on 'marginal learners'—those who qualify for admission to higher education but whose likelihood of successfully completing degrees must be improved before university entry. Opportunities should be expanded in high-functioning schools, and stronger links are needed between post-school education and training and workplace requirements. The report examines the importance of education for growth and employment, the current state of education in South Africa, and education policy reforms that take into account South Africa's current fiscal constraints.

Key words: South Africa, education, growth, inclusive development

JEL classification: H52, I24, I25, I28

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* Department of Economics, University of Stellenbosch and School of Business and Economics, Vrije University, Amsterdam, Netherlands, p.sr.courtney@gmail.com.

Figures

Abbreviations

4IR	Fourth Industrial Revolution
ANAs	Annual National Assessments
BEd	Bachelor of Education
CAPS	Curriculum and Assessment Policy Statement
CAS	Central Applications Service
CESM	Classification of Educational Subject Matter
DBE	Department of Basic Education
DHET	Department of Higher Education and Training
ECD	early childhood development
GEC	General Education Certificate
HE	higher education
IEA	International Association for the Evaluation of Educational Achievement
IRT	item response theory
LER	learner–educator ratio
LMIU	Labour Market Intelligence Unit
MCQs	multiple-choice questions
MTEF	Medium-Term Expenditure Framework
MTSF	Medium-Term Strategic Framework
NBT	National Benchmark Test
NDP	National Development Plan
NIAF	National Integrated Assessment Framework
NQF	National Qualifications Framework
NSC	National Senior Certificate
NSF	National Skills Fund
NSFAS	National Student Financial Aid Scheme
OECD	Organisation for Economic Co-operation and Development
OERs	Open Educational Resources
OSD	Occupation Specific Dispensation
PGCE	Postgraduate Certificate in Education
PIRLS	Progress in International Reading Literacy Study
PPP	purchasing power parity
PSET	post-school education and training
QCTO	Quality Council for Trades and Occupations
QLFS	Quarterly Labour Force Survey
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SAQA	South African Qualifications Authority
SARS	South African Revenue Service
SA-SAMS	South African School Administration and Management System
SD	standard deviation
SDL	Skills Development Levy
SETA	Sector Education and Training Authority
SMS	School Monitoring Survey
SMT	School Management Team
TIMSS	Trends in International Mathematics and Science Study
TVET	technical and vocational education and training
WPBL	workplace-based learning

Definitions

Annual National Assessments: discontinued standardized tests administered annually to assess the literacy and numeracy skills of students in specific grades.
Central Applications Service: an envisioned centralized service that manages applications for admission to higher education institutions.
Curriculum and Assessment Policy Statement: the comprehensive policy document that outlines the curriculum and assessment standards for each subject and grade.
Diagnostic assessments: low-stakes evaluations used to identify students' strengths and weaknesses, guiding instructional planning.
Early childhood development: care and education of children from birth to school-going age, focusing on their cognitive development.
Focus schools: specialized public schools that emphasize an advanced curriculum and high academic standards in specific subjects.
General Education Certificate: an assessment and qualification being piloted for award upon completion of Grade 9.
International Association for the Evaluation of Educational Achievement: an international cooperative of national research institutions and governmental research agencies that conduct large-scale comparative studies of educational achievement.
Item response theory: a statistical framework used to design, analyse, and score assessments, ensuring reliability and validity.
National Benchmark Test: privately administered standardized tests used to assess the academic readiness of students for higher education.
National Development Plan: the flagship strategic plan aimed at eliminating poverty and reducing inequality by 2030 through inclusive development.
National Integrated Assessment Framework: the framework for implementing comprehensive national assessments to evaluate education outcomes.
National Senior Certificate: the qualification awarded upon successful completion of Grade 12, serving as the high school graduation certificate.
Occupation Specific Dispensation: a remuneration framework which in the education sector was intended to retain experienced teachers and improve their salaries based on performance.
Open Educational Resources: educational materials that are freely accessible and openly licenced, allowing users to legally use, modify, and share them.
Progress in International Reading Literacy Study: an international study run by the IEA that measures the reading comprehension and literacy of fourth-grade students across various countries.
Quality Council for Trades and Occupations: a regulatory body overseeing the quality of vocational and occupational education and training.
Sector Education and Training Authority: bodies established to develop skills in various sectors of the economy, funded by the Skills Development Levy.
Skills Development Levy: a tax imposed on employing someone, used to fund skills development initiatives and training programmes.
Southern and Eastern Africa Consortium for Monitoring Educational Quality: an international organization that monitors and evaluates the quality of education in Southern and Eastern Africa of which South Africa is a member.
Summative assessments: Comprehensive evaluations administered at the end of an instructional period to measure student learning outcomes.
Systemic evaluations: sample-based assessments conducted to gauge the overall performance and health of an education system.
Technical and vocational education and training: education and training programmes focused on practical skills and technical knowledge for specific trades and occupations.

Trends in International Mathematics and Science Study: an international assessment run by the IEA that evaluates the mathematics and science knowledge of students around the world.
Workplace-based learning: training programmes that combine practical work experience with academic learning, typically in vocational education.

Executive summary

This report examines how education can contribute to economic growth and employment in South Africa, particularly during the current period of fiscal consolidation. It argues that the key to more rapid educational progress—both in the quality of schooling broadly considered and in expanding higher education outcomes—is foundational literacy and numeracy. A special focus is proposed on 'marginal learners'—those who qualify for admission to higher education but whose likelihood of successfully completing degrees must be improved before university entry. Opportunities should be expanded in high-functioning schools, and stronger links are needed between post-school education and training and workplace requirements. The report is divided into three main sections: the importance of education for growth and employment, the current state of education in South Africa, and high-potential education policies. Ten primary policy recommendations are proposed, outlined at the end of this executive summary.

The importance of education for growth and employment

Education is a critical enabler of economic growth. Research shows that from 1960 to 2000, international measures of maths and science skills explained three-quarters of the variation in GDP growth per capita across countries (Hanushek and Woessmann 2021). If South Africa's education outcomes were on par with those of its upper-middle-income peers, its GDP would be expected to be 23–30 per cent larger (Gustafsson et al. 2010). The economic returns to education in South Africa are particularly high, with university graduates facing significantly lower unemployment rates (9 per cent vs 33 per cent) and higher incomes than those with only a senior certificate. This suggests the need to improve university throughput rates to support economic growth—by addressing both the weak readiness for higher education of many students and poor completion rates.

The marginal return to education increases significantly at higher education levels, with university graduates experiencing much lower unemployment rates and earning substantially higher wages. This report argues that there should be a substantially increased emphasis on science, technology, engineering, and maths (STEM) fields in strengthening higher education outcomes. Both public and private sector TVET capacities should be enhanced, recognizing the key role of education in facilitating technical progress and productivity improvements. For more rapid progress to be made in addressing South Africa's history of discrimination and under-investment in human capital, broad-based education improvements are needed together with expanded opportunities in high-functioning schools and post-school education.

Shortfalls in education outcomes detract from economic growth, but slow growth, inequality, and limited fiscal resources also hold back education progress. Despite improvements in the lower half of the learning distribution, the employment outlook for young work-seekers has deteriorated, growth remains sluggish, and fiscal resources are not keeping pace with social needs. In these circumstances, strategies for improving the efficiency and quality of foundational schooling have to be sought while strengthening links between employers and TVET institutions and building on both public and private sector development capacity.

The state of education in South Africa

Basic schooling

Apartheid education created deep-seated barriers to inclusive economic growth. The education system's development is characterized by three distinct periods: limited improvement during apartheid, rapid gains post-1994, and stagnation followed by pandemic-induced learning losses. South Africa's post-1994 learning improvements are often attributed to the Rainbow Workbooks and the School Nutrition Programme, policies spearheaded by the DBE. However, these gains have not been sustained at the higher end of the learning distribution that is crucial for generating future university graduates, who are critical contributors to future productivity, growth, and fiscal resources.

Alongside large learning improvements, South Africa has made notable gains in educational equality, at least prior to the pandemic. These equality gains can be seen in relatively large improvements in African languages and a declining gap in the number of NSC maths A grades produced in the top schools and in the rest. Until at least 2016, South Africa had a level of learning inequality that would be predicted by our learning level in an international comparison. However, the recent decline in maths literacy A grades, despite an increase in passes, indicates slow progress at the top of the learning distribution. This highlights the need for targeted interventions to support high-achieving students who will ultimately drive economic growth through creating a more skilled, university-educated workforce.

The pandemic turned incipient learning stagnation into substantial learning losses. South Africa experienced the largest reduction in reading outcomes among participating PIRLS countries. This loss disproportionately affected disadvantaged learners, increasing educational inequality. The increase in inequality has come not from large gains at the top of the distribution but rather from substantial losses at the bottom. This raises concerns about the future tax base and the sustainability of the education system.

The report highlights the need for targeted education policies to increase university graduation rates and improve foundational literacy and numeracy. Diagnostic and formative assessments are emphasized for their role in identifying student strengths and weaknesses early, which is essential for effective instructional planning. The report also underscores the importance of efficiently allocating educators to schools and classes and consolidating multigrade schools to enhance resource utilization. 'Teaching at the right level', particularly in the context of closing multigrade schools and encouraging schools to stream learners, is crucial for improving learning.

The report identifies significant administrative inefficiencies that contribute to larger class sizes than necessary. For example, some schools maintain small classes with the same number of educators and learners as other schools with very large classes. This has led to large differences in class size averages at the provincial level. Better timetabling and educator allocation could be vital during this period of fiscal consolidation.

South Africa's spending on basic education has remained stable, but the rising cost of educator salaries, which have increased significantly above inflation, poses a challenge. The efficient allocation of educators and learners to schools and classes and the potential consolidation of multigrade schools are proposed as solutions to improve the efficiency of the education system.

Trends in post-secondary education and training

Increased spending on post-secondary education, partly in response to political mobilization around higher education affordability, has not translated into better outcomes. For instance, only 30 per cent of full-time undergraduate students in three-year degree programmes graduate within the three-year timeframe. This indicates a need for better preparation at the basic education level. The report suggests that focusing on foundational skills in the early years of education is crucial for long-term success. It is ineffective to focus on learners who will enter but not complete university only once they reach high school, or indeed university. As the effects of poor foundational literacy and numeracy compound, learners must be targeted at the beginning of their learning journey. Strengthening these early foundations is crucial for enhancing academic performance and increasing university completion rates.

The long tail of NSFAS recipients, where many students do not graduate within the allocated timeframe, presents a challenge. Despite financial support, 44 per cent of NSFAS recipients do not graduate within five years, and many remain in the system for extended periods without completing their degrees. This inefficiency indicates a need for better alignment between funding and student preparedness.

The report notes that current university enrolment patterns do not align with the nation's employment priorities. High proportions of university students are enrolled in humanities and education programmes, while enrolment in science, engineering, and technology has stagnated. The growth of the TVET college system has stalled, and there are concerns about its quality and adequacy. Stronger links between colleges and employers and a reorientation of resources and incentives towards fields with higher public returns on investment are recommended.

Moreover, the SDL system appears to be particularly inefficient, with high costs and little evidence of positive employment or productivity outcomes. The cost of SETA enrolment is notably higher than that of university enrolment, underscoring the need for better resource allocation and efficiency improvements. The report recommends a comprehensive overhaul of the skills development system and the SETAs and QCTO, alongside the strengthening of college programmes and improved targeting of educational investments.

The report emphasizes the importance of foundational competences both for overall improvements in education and for better outcomes in higher education and further education and training. South Africa has well-established education and training institutions on which to build, both in the public and the private sectors. The institutional and funding mechanisms through which college programmes are aligned and adapt to the needs of employers must come under scrutiny. Of special importance is improving the foundational capabilities of those who transition, at the margin, between secondary schooling and higher education. A strategic approach to education policy is needed—one that balances immediate needs with long-term goals to ensure sustainable economic development.

Education reforms and policy options

Basic education

National Diagnostic Assessments: These diagnostic assessments, also known as formative assessments, provide educators with curriculum-aligned, quality-controlled, and centrally produced assessment instruments. High-quality assessment instruments enable educators to assess their learners in order to better understand learning deficiencies and learner alignment with the appropriate grade and curriculum. Centrally produced diagnostic assessments would reduce the

burden on educators to create unique yearly assessments for their learners, meeting the dual policy imperatives of improving education efficiency while maintaining educator buy-in. This would follow the widely lauded successes of the DBE's Rainbow Workbooks in providing national, high-quality learning and teaching support materials.

Systemic evaluations: Systemic evaluations assess a nationally representative random sample of learners in Grades 3, 6, and 9 in language and mathematics using assessments that are psychometrically comparable between provinces and over time. South Africa currently has no high-frequency measurement of learning performance in the key subjects of language and mathematics. The Western Cape has had significant success in implementing such assessments. Although there is currently no political scope for universalizing assessment to all learners since the discontinuation of the ANAs, systemic evaluations provide an important stepping stone towards such summative assessments.

Educator and principal professional licensure examinations: It is widely recognized that inadequate teacher content knowledge is a central problem of South Africa's education system. As in many other countries, a robust professional examination might assist in raising the entry bar, and in lifting the content requirements of the BEd and PGCE university qualifications. The NDP calls for competency assessments prior to principal appointments, reiterated in the DBE's Action Plan to 2024.

Enhancing teacher performance, rewarding excellence, attracting talent: The compensation of educators is a large share of government spending, boosted since the late 2000s by the OSD, introduced to incentivize educator performance and retain the best-performing educators. However, near-universal notch progression has weakened this incentive effect. Content knowledge is the significant capability shortfall, and it is unclear whether teacher training can improve this. Notch progression should be tied to performance, but with careful consideration given to appropriate measures and oversight. Pay progression is important, but it is also important that the OSD entrance notch should be sufficient to attract capable candidates into education. Other aspects of the conditions of employment and the work environment are also important in attracting and retaining the best possible teaching force.

Reimagining the DBE's 'focus schools' as magnet schools of excellence: To strengthen the quality and depth of South Africa's through-flow from schools to higher education and colleges, consideration should be given to the role of high-performing focus schools—both to expand the numbers they enrol and to provide merit-based access paths from neighbouring community schools. This aligns with the concept of 'teaching at the right level' and should be complemented by formalizing streaming within schools (the practice of grouping learners by learning level).

ECD quality assurance should precede ECD universalization: Currently, Grade R is being universalized and the addition of a Grade R-1 year is under consideration. Considering the costs involved, it is important to improve the evidence base for expanding pre-school enrolment and progressively measure outcomes as ECD is universalized. Without comprehensive and time-tested quality assurance mechanisms for Grade R educators and ECD practitioners, there is inadequate robust evidence that replacing caregiver contact with ECD practitioner (or educator) contact will improve learning and life outcomes.

Implement the comprehensive literacy plan: The comprehensive literacy plan outlined in *Identifying Binding Constraints to Education* (van der Berg et al. 2016) aims for all learners to be able to read fluently and with comprehension by the end of Grade 3. This plan includes a Directorate of Primary Literacy and a national reading strategy, with specialized training for teachers on 'how to

teach reading' and regular bi-annual monitoring of progress. Independent assessments ensure that Grade 3 reading proficiency meets national standards.

The plan emphasizes the importance of shared standards for reading in English and mother tongue languages. Reformulating a national early grade reading strategy, training new reading specialists, and launching a public awareness campaign on early reading competencies are also crucial components. This is the foundation plan on which other elements of an education progress strategy can be built.

Post-secondary education and training

Higher education student finance reform: The Davis Tax Committee has recommended that the capacity of South Africa's banking and financial services sector should be leveraged to ensure the sustainability and fairness of an expanded higher education funding model (Davis et al. 2016). The proposed approach would take advantage of the administrative capacity of SARS for the repayment of income-contingent loans. Viewed more broadly, there is scope for blending general student financial assistance with industry or vocationally targeted support, recognizing the specific needs of sectors such as healthcare, education, financial services, municipal utilities, and construction. A more diversified approach to student finance is called for, recognizing the limitations of fiscal resources.

Enhancing institutional efficiency and integration in post-secondary education: Measures proposed to enhance institutional efficiency and coherence in the post-secondary education landscape include the following:

- standardize and overhaul fragmented data systems;
- operationalize the envisaged CAS;
- simplify the NQF and re-evaluate TVET qualifications;
- support and expand open education resources;
- enhance labour market responsiveness, especially through the use of tracer studies and occupational skills assessments.

Reforming and modernizing post-secondary education: Systematic planning and evidence on institutional effectiveness and labour market outcomes are critical elements in modernizing the post-secondary education system. Leading reforms include the following:

- enhancing and integrating Community Education Colleges (CETs) to meet local employment and economic needs;
- promoting partnerships with technology companies and science councils in modernizing curricula;
- expanding and improving TVET course offerings, ensuring that qualifications are well aligned with labour market needs;
- reviewing the skills levy system, with a view to achieving better value for money, reducing administrative costs and strengthening college-based programmes;
- investment in vocational education infrastructure and institutional capacity, including quality assurance mechanisms.

1 Introduction

This report is divided into three sections. In the first, the relationship between education, growth, and employment is outlined. This section examines the robust relationship between measured learning and GDP growth globally and highlights South Africa's particularly high employment and income returns to education. The section also explores why years of schooling (education quantity) does not have a significant effect on growth and employment. South Africa's convex returns to education—where returns to university education are substantially larger than returns to any preceding stage of education—are discussed. The first section concludes by focusing on the interface between schooling and further education or work at the margin—why many learners leave school and do not find work, why many who qualify for higher education do not go on to obtain a degree or diploma, and what needs to change if better outcomes are to be achieved. The implications of this approach for equity are also discussed, as well as why special attention should be given to the foundation phase.

The second section examines several critical aspects of the country's education system. It begins with a brief overview of South Africa's education history, highlighting the deep and enduring impact of apartheid education deprivations. It tracks the education system's evolution through three distinct periods: the stagnant apartheid period, a phase of rapid learning improvements, and the recent period defined by learning stagnation and subsequent pandemic-induced learning losses. The discussion then shifts to low achievement at the top of the learning distribution, its causes, and its implications for the economy, the fiscus, and the internal coherence and reproduction of the education system.

Drawing in part on international experience, aspects of education system improvement are discussed. The concept of 'teaching at the right level' is introduced, emphasizing the hierarchical nature of learning and the benefits of streamed educational programmes. The fiscal environment of education in South Africa is also examined, highlighting the substantial increase in post-secondary education spending, the implications of rising educator salary levels, and inefficiencies in the allocation of educators and resources. Some of the administrative challenges are outlined, along with the potential for improved efficiency, for example through expanding well-functioning schools while closing smaller multigrade schools. The section examines PSET trends and explores the scope for rationalizing the NSFAS. This section also describes other important trends in PSET, including the disproportionate levels of expenditure by SDL institutions relative to the employment and learning outcomes these institutions achieve.

The final section reviews a range of policy issues reflected in the goals and programmes of the DBE and DHET and those emphasized by local and international researchers. The focus is on policies related to economic growth and development, and the internal efficiency of the education system. Particular attention is given to foundation phase literacy and numeracy, both for its broad-based impact and as the foundation of improved post-secondary learning and employment outcomes. The intention is to provide a concise, structured, and referenceable catalogue of policy measures and implementation considerations, rather than a detailed assessment of options.

Basic education reform is considered first, initially focusing on assessment policies. Diagnostic (formative) assessments are emphasized, including their purpose, importance, and design. The value of assessments for various stakeholders, including learners, educators, parents, and the broader education system, is also discussed. Systemic evaluations are presented as essential for gauging the performance of the education system through rigorous, psychometrically robust assessments comparable across provinces and over time.

Consideration is also given to the long-run goal of summative assessments and their role in promoting equity, engagement, and consistent education standards. The importance of educator and principal professional licensure examinations is examined, together with possible refinements to the OSD for educators. Measures that might strengthen the DBE's focus schools initiative are explored. Finally, quality assurance aspects of the expansion of ECD and Grade R are considered.

The final set of policy issues concerns PSET, drawing heavily on the DHET's *National Plan for Post School Education and Training 2021–2030* (DHET 2021a). Higher education financing is discussed, drawing on the Davis Tax Committee's proposed approach to diversifying funding and developing a sustainable student financial aid system (Davis et al 2016). The roles and responsibilities of key PSET stakeholders are outlined, emphasizing systems integration, resources, and curriculum cohesion. The section also addresses enrolment targets and the responsiveness of the system to economic and labour market needs. A reconsideration of the skills development funding system is proposed.

2 The importance of education for growth and employment

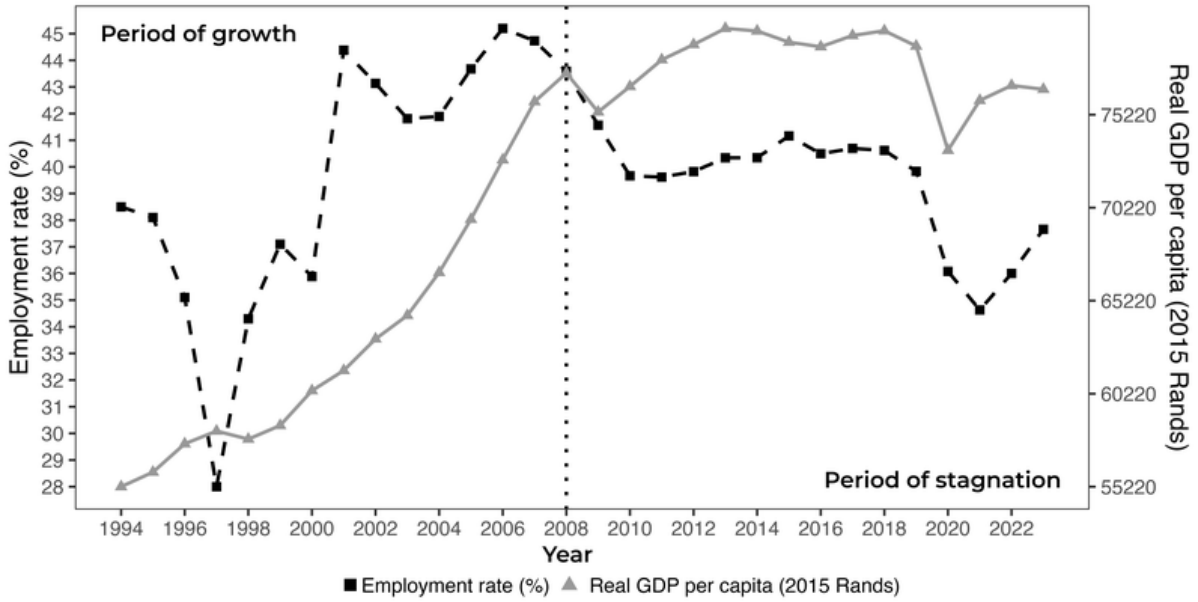
2.1 Evidence on how education drives GDP growth

The relationship between measured learning and GDP growth is remarkably robust. Researchers have found that education is one of the best predictors of growth and development (Hanushek and Woessmann 2021). From 1960 to 2000, international measures of maths and science skills accounted for three-quarters of the variation in GDP growth per capita across countries (Hanushek and Woessmann 2021).

In South Africa, the potential gains from education progress are high. South Africa's GDP would be between 23 and 30 per cent larger if education outcomes were at the average level of its upper-middle-income peers (Gustafsson et al. 2010). In an international context, South Africa has been ranked among the top five countries globally in terms of the estimated economic returns to education (Montenegro and Patrinos 2014). The returns to education in South Africa accrue mainly to those who graduate from university, the importance of which is detailed below.

A nation's prosperity is determined by its productivity and economic output growth, which are broadly determined by the skills and capabilities of its population. Employment growth, in turn, is largely determined by economic growth. Figure 1 illustrates how the deterioration in economic growth in South Africa after 2008 was associated with a weakening in the rate of employment, measured as a percentage of the working-age population. Slow economic growth also limits the resources available to government, and its ability to finance social and welfare services and infrastructure investment. Sluggish growth and low levels of education are barriers both to improvements in living standards and to reducing the inequalities that characterize South Africa's social structure.

Figure 1: The relationship between growth and employment in South Africa



Source: author's illustration; Stats SA and World Bank (2024); World Bank (2024), accessed through Arel-Bundock's (2022) R package.

The relationship between education and the economy also flows the other way: rising incomes and fiscal resources allow both households and government to invest more in education and to broaden access to training and post-school opportunities. Households contribute to learning outcomes both through spending on education and through investment in home environments conducive to study and learning activities. Studies of education trends and outcomes show strong relationships between family incomes and parental education levels and the schooling outcomes of children. Poverty clearly affects childhood development—a hungry child cannot learn effectively (NDoH et al. 2019)—and family members are also important contributors to learning outcomes.

Theories of economic growth, therefore, emphasize the role of 'human capital' as a productive resource, embodied in the knowledge, capabilities and skills of a nation's workforce (Bradley and Green 2020). Endogenous growth theory goes further—drawing attention to the incentives and internal dynamics of a society's institutions that drive learning and knowledge acquisition, underpinning productivity change (Romer 1990). One strand of this literature emphasizes the links between investment in physical plant and equipment, productivity, and technology adoption, which in turn relies on both knowledge and the ability to learn 'on the job'.

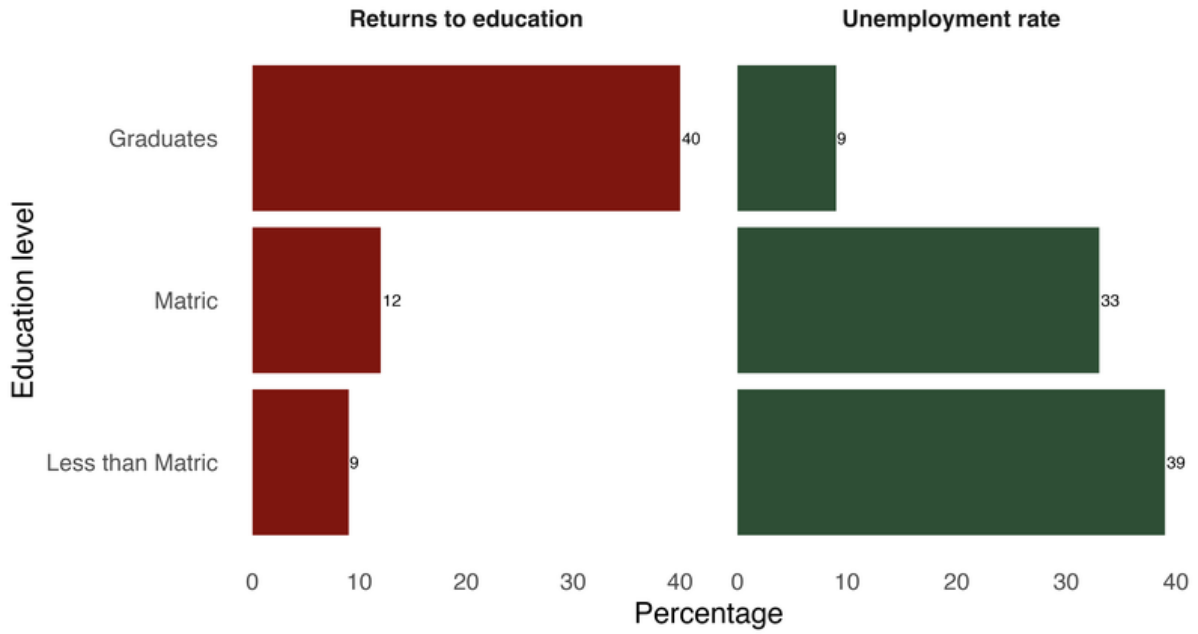
It is important to note that measures of education based only on years of schooling attained are often misleading. The content and quality of education are key outcomes and account for a greater share of the differences between countries in learning levels than quantitative attainments (e.g. years of schooling). Indeed, when learning outcomes are well measured in international comparisons, years of schooling loses significance as a predictive indicator entirely. It is not mere attendance at school or even expenditure on schooling but rather substantive learning capabilities that underpin the know-how and understanding that matter for future productivity and adaptability (Bradley and Green 2020). This report therefore focuses on education quality or learning outcomes as the primary indicator of the health of the education system.

To the extent that the Millennium Development Goals or national education plans, for example, focus on access rather than quality, they may be misleading targets for broad-based development and growth. Critics of a narrow focus on expanding access have suggested that this leads not to genuine education but to an imitation of education practices, a process sometimes termed 'isomorphic mimicry' (Pritchett et al. 2013). There may be teachers in front of students, in classrooms, in schools with all of the formal systems apparently in place, yet whether actual learning occurs may depend on other things. Housing and family circumstances, child nutrition, verified teacher knowledge, and school management capabilities are among the contextual factors that might explain or interfere with learning outcomes. Targets for expanding access, whether in ECD or Grade R or in TVET and higher education may have unintended consequences. Trade-offs between quality and quantity of education must be carefully considered.

2.2 Convex returns to education

Progress in South Africa's basic education system, though slow, is evident in several key learning indices discussed below. Learning improvements are apparent across the system, particularly in the lower half of the learning distribution. In the context of slow economic growth since 2008, it is hard to find evidence of economic returns to improved education in employment, earnings, or tax revenue. Part of the reason for this, beyond the well-documented exogenous strains on the economy, is that the learning improvements have not taken place where skills are most demanded in the labour force—at the top of the learning distribution. South Africa's GDP per capita has been stagnant or in decline since 2008. Poor economic prospects affect, most of all, those who leave before completing 12 years of schooling or who do not progress to higher or further education and training opportunities. Inequality of income has widened (Jacobs et al. 2024).

Figure 2: The relationship between education level and labour market outcomes



Source: author's illustration based on Statistics SA Quarterly Labour Force Survey (2023); Montenegro and Patrinos (2014); Stats SA (2024).

Returns to education are measured at a point in time by examining the distribution of age-income profiles associated with different levels of educational attainment. For all age cohorts, higher education attainment is correlated with higher prospects of work and higher earnings levels—though there is typically considerable variation around the means. South Africa exhibits highly

convex returns to education—in other words, the marginal value of each additional year of learning increases as students reach later stages of education, particularly upon university graduation. The differences in employment and income outcomes between high school graduates and university graduates are among the highest in the world (Montenegro and Patrinos 2014).

Recent estimates indicate that nearly 40 per cent of individuals without completed secondary schooling are unemployed compared with 33 per cent of those with a senior certificate and only 9 per cent of university graduates. In Figure 2, these unemployment rates are plotted alongside the estimated returns to education, calculated as the percentage earnings increase on no education (only among the employed). Combining these employment and income effects leads to a substantial advantage to completing university over completing only a senior certificate.

Understanding these returns (Burger and Teal 2015) and the reasons behind their convex nature is complex. One possibility reflects South Africa's historical context, which has led to limited supplies of qualified and skilled people while the demands of a modernizing economy have continued to increase. Another focuses on the poor quality of schooling and the inadequacy of vocational education and training opportunities. This latter hypothesis is supported by the fact that even moderately skilled workers are paid well by international standards (more than three times in the automotive sector, increasing the higher the skill level), suggesting a constrained supply of moderately skilled labour rather than low demand for workers or supply of jobs (Barnes et al. 2017).

Understanding these returns and the reasons behind their convex nature is complex (Burger and Teal 2015). One possibility reflects South Africa's historical context, which has led to limited supply of qualified and skilled people while the demands of a modernizing economy have continued to increase. Another focuses on the continued poor quality of schooling and the inadequacy of vocational education and training opportunities. These hypotheses are supported by the fact that even moderately skilled workers are paid well by international standards. For example, labour costs in the automative sector in South Africa are, on average, nearly five times higher than those in the automotive sector in Thailand, a reasonable comparator country due to its similar stage of industrial development and regional relevance (Barnes et al. 2017). Notably, this cost multiplier tends to increase with higher skill levels, indicating a constrained supply of skilled labour rather than a low demand for workers or supply of jobs

It should be stressed that these measures, taken from current patterns of earnings and related to past educational attainment, are not actual estimates of the economic returns to current education activities. They may be useful indicators, but as the quality and distribution of education change, and as economic development patterns evolve, the measured 'returns' to education will change.

While high returns to post-school education might suggest that university and college enrolment and graduation rates should be expanded, the dynamics of education system change are complex. Notably, the learning of university entrants is often not at the level needed to succeed, despite achievement of a bachelor's pass. The best internationally comparable evidence of learning achievement in high school in South Africa suggests that vanishingly few learners are at the required learning level for university. Only 1 per cent of Grade 9 learners (the highest grade at which South Africa participates in international assessments) reach the Advanced International Benchmark when writing the Grade 8 (one grade easier) assessment in mathematics in TIMSS Grade 9 (Mullis et al. 2020). This emphasizes that the binding constraint to education (which drives employment through university graduation) is poor foundational learning rather than poor university training, as likewise stressed by the local literature on education in South Africa (van der Berg et al. 2016). This is also reflected in university completion rates, with only 30 per cent of three-year undergraduate degree learners completing their degree in three years (DHET 2023).

This suggests that most universities are struggling with the university-readiness of their learners. University quality is highly heterogeneous but does not seem to be the binding constraint at this point.

Calculated education returns reflect average earnings differentials, which may not be reliable indicators of the marginal impact of enrolment growth. Consideration also has to be given to maintaining or enhancing the quality of university and TVET education programmes, and to the opportunity costs of expanding further education while basic education challenges remain to be addressed. Consideration must also be given to the diversity of occupational and professional needs, and the respective roles of the higher education, TVET, and skills training systems.

2.3 Educational improvements at the margin: Better schooling, better post-school outcomes

South Africa's steeply increasing returns to education provide an economic rationale for increasing university and college admissions and completions. But there are also clear distributional grounds for broad-based improvements to schooling and learning opportunities. Education is a key vehicle for reversing apartheid inequalities. How are these competing priorities to be reconciled?

Policies to improve the quality of student flows to and through higher education could take two orientations. The first is to pay equal attention to all learners, or particularly to those at the bottom of the learning distribution. This perhaps represents current thinking and reflects a strong commitment to achieving equity in education. A second approach focuses on learners at the margin—those who achieve bachelor's pass levels but either do not proceed to higher education or enter but do not complete their studies, i.e. those near (but not at) the top of the learning distribution. This approach would achieve greater growth of throughput in universities and colleges at a lower cost while also contributing to a more competitive schooling environment.

The first approach results in incidental increases in the number of learners entering and completing university. Learners near the top of the distribution, who might complete university, progress at the same rate as or more slowly than others. Significant resources are required to move every learner up to increase the university completion rate. In contrast, the second approach increases enrolment and university completion at the lowest possible cost. This releases resources for more broad-based education improvement initiatives.

Learning outcomes correlate closely with socioeconomic status. Focusing on learners from, say, the top 25 per cent would widen the learning gap between the 50th and 75th percentiles. However, this approach does not target the most privileged, those already entering and completing university: it targets those who might gain access but are currently unlikely to complete university or college programmes. The marginal university or college entrant comes from a previously disadvantaged background.

Within this marginal learner framework, it is also important to target disadvantaged learners and schools. Providing gifted learners from poorer households or communities with access to better education enhances both equity and the efficiency of the school system.[1] This motivates the

[1] Chicago's Gifted Program, which supported Michelle Obama, is an example of how targeting marginal entrants can promote upward mobility for those from the poorest sections of society. In the South African context, various organizations provide financial support for admission to high-functioning schools for academically strong learners from neighbouring communities. This can be thought of as another form of intervention at the school achievement 'margin'.

recommendation of this report that 'focus schools' for learners identified as gifted are one of the best ways to provide poorer communities with opportunities for upward mobility while also improving the university completion rate.

Consideration also has to be given to the interface between schooling and work. It is not just that secondary school completion improves employment prospects; there are also shortcomings in the quality and content of basic schooling that interfere with adaptation to the work environment and readiness for post-school vocational education programmes. In recent years, progress has been made in developing work-seeker support programmes that assist in bridging the gap between school and job opportunities, focused both on the attributes and interests of jobseekers and on the specific requirements of employers in different sectors or industries.[2] To improve the effectiveness of TVET colleges and the outcomes of skills development programmes, initiatives of this kind need to be strengthened.

Given South Africa's fiscal constraints, while also recognizing that households and businesses have direct interests in education and training outcomes, it is important to explore options for diversifying funding arrangements in ways that are 'incentive-compatible'—that reward performance, encourage productive resource allocation, and ensure that learning programmes meet the needs of individuals and employers. This is central to the challenge of strengthening the contribution of the education system to growth, broadening employment opportunities, and expanding fiscal resources. Policy measures and targeted interventions that might contribute to better education and training outcomes are explored in the third section of this report.

3 The state of education in South Africa: Trends, outcomes, and reform priorities

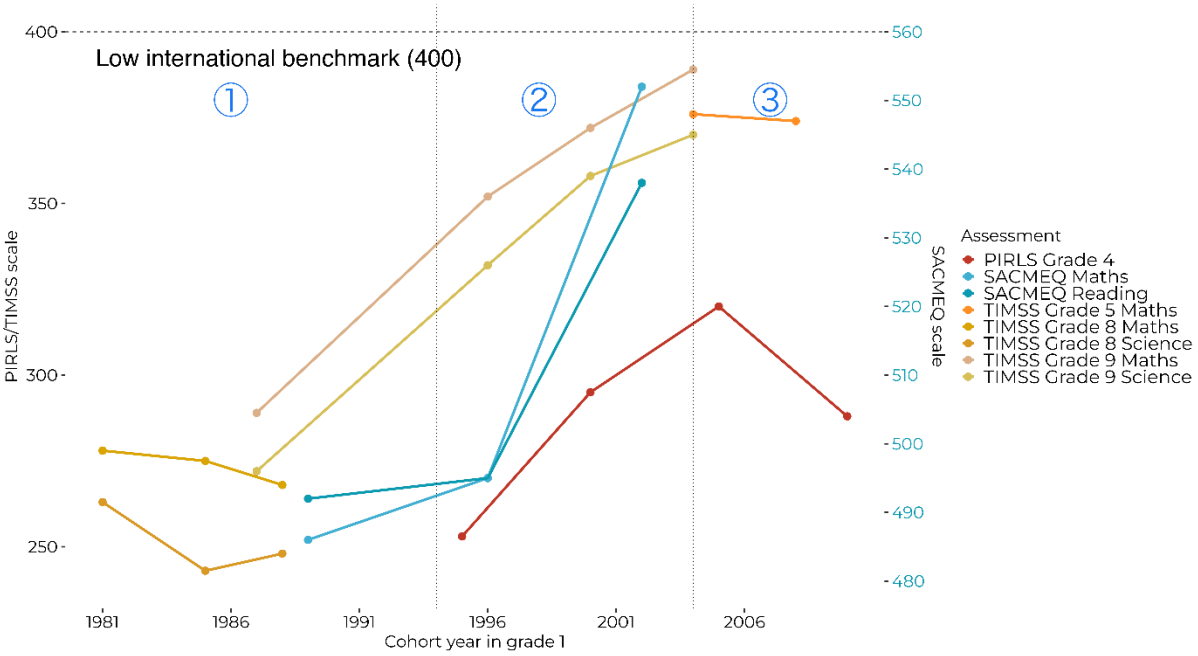
3.1 The historical context of education in apartheid South Africa

Apartheid education deprivations contend for the deepest and most enduring structural impediment to inclusive economic growth and employment. An effective education system depends on highly educated educators, parents, district officials, lecturers, psychometricians, ECD practitioners, and so on. Yet, in turn, an effective education system is needed to produce these highly educated stakeholders. The aim of this document is to understand and explore policy to break this vicious cycle.

The performance of the education system in South Africa since 1994 can be divided into three distinct periods. Figure 3 tracks cohorts as they enter school and are assessed in internationally comparable and nationally representative assessments. The first period includes cohorts who entered in the 1980s and experienced little improvement. There may have been some improvement for cohorts who entered just before the end of apartheid, as they had some exposure to the post-apartheid education system. The second period is marked by comparatively rapid improvements. The third period is characterized by pre-pandemic stagnation and finally pandemic-related learning losses.

[2] See, for example, www.harambee.co.za. It is worth noting, though, that while an improved interface between school and work is helpful, this is not a substitute for either education quality or more rapid growth and employment creation.

Figure 3: Maths, science, and reading outcomes in large-scale international assessments, by cohort year (1981–2011)



Note: this figure follows the cohort at entrance to Grade 1, not year of assessment; 2011 PIRLS result corrected per Gustafson (2020); IEA does not validate the intertemporal comparability of the pre-democracy cohorts.

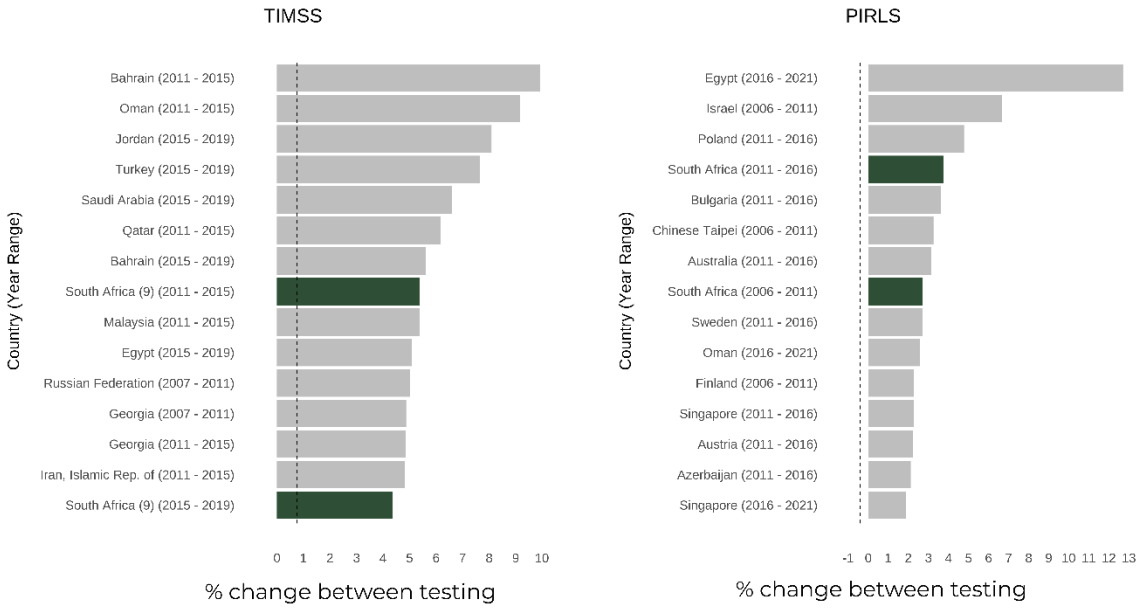
Source: author's elaboration of international assessment benchmarks drawing on Gustafsson and Taylor (2022) and Spaull et al. (2022).[3]

3.2 Period of improvement

The cohorts entering school between 1994 and 2004 experienced exceptional learning improvements, tested at different grades between 2006 and 2015 (Period 2 in Figure 3). This period in South Africa saw some of the fastest learning improvements globally, approaching what some have termed the 'system-level learning improvement speed limit' (Gustafsson 2019) (see Figure 4). These gains resulted partly from system-wide reforms, including the School Nutrition Programme and universally available Rainbow Workbooks (DBE 2020a).

[3] The test dates of the cohorts in Figure 3 are as follows: TIMSS Grade 8 [1995, 1999, 2003] (Mullis et al. 1997; Martin et al. 2000; Mullis et al. 2004), TIMSS Grade 9 [2003, 2011, 2015, 2019] (Mullis et al. 2004, 2012, 2016, 2020), TIMSS Grade 5 [2015 and 2019] (Mullis et al. 2016, 2020), SACMEQ Grade 6 [2000, 2007, 2013] (SACMEQ 2005, 2010, 2017), PIRLS Grade 4 [2006, 2011, 2016] (Mullis et al. 2007; Martin and Mullis 2013; Mullis et al. 2017).

Figure 4: The 15 fastest periods of improvement in PIRLS and TIMSS (1995–2021)



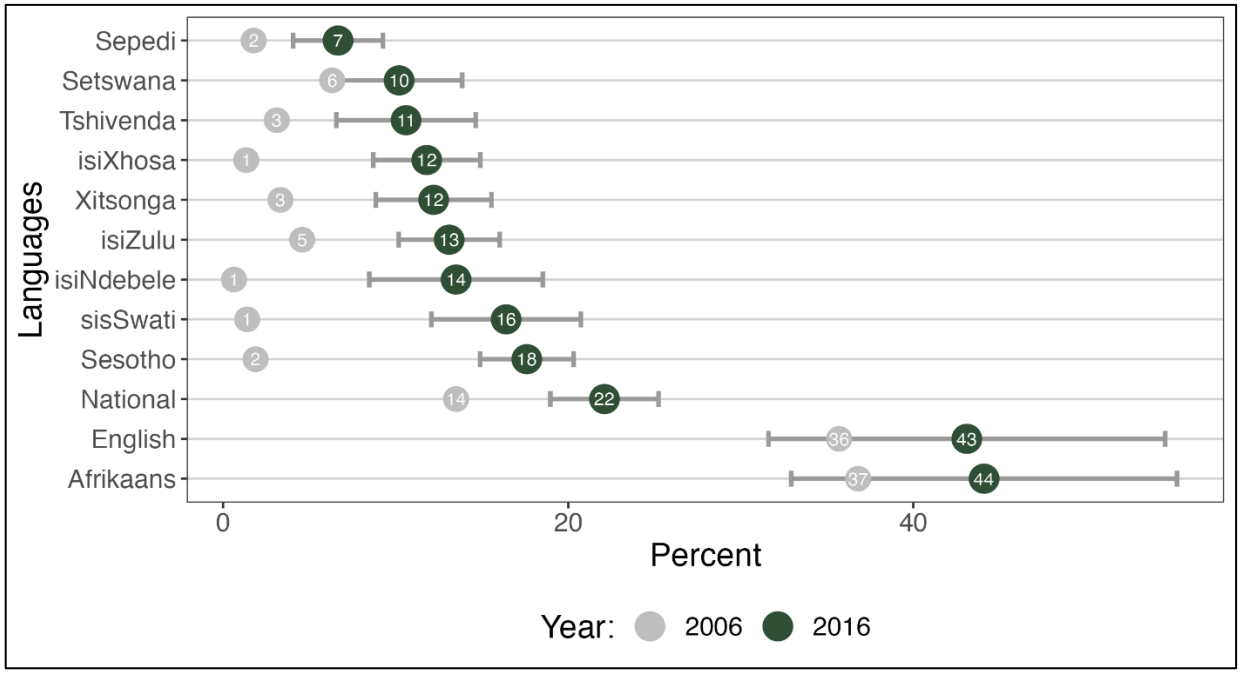
Note: SA Grade 9 TIMSS (a year older than other countries) and Grade 4 PIRLS assessments shown; dashed lines indicate average improvement between 1995 and 2021, −0.41% for PIRLS, 0.75% for TIMSS; only periods consecutively tested are included; improvement is shown as a percentage of IRT scores, as assessments are comparable across periods—a more intuitive measure than SDs.

Source: author's illustration based on IEA (1995–2021a, b).

Despite rapid improvement, apartheid left South Africa's starting point so low that average learning levels have never exceeded the low international benchmark. This benchmark represents basic numeracy and literacy in the foundation phase, on which all future learning depends. Consequently, South Africa remains well below its middle-income peers in average learning achievement. Lessons might perhaps be learned from countries such as Vietnam and Poland, which have improved more quickly than South Africa even while starting from a higher level of learning.

South Africa's decade of improvement was marked not only by world-leading average improvement but also by a substantial reduction in learning inequality. This is particularly noticeable in the improvements in African languages compared with the statistically insignificant improvements in English and Afrikaans over this period (see Figure 5). Additionally, Grade 9 maths saw substantial equality improvements, the bottom 25 per cent of learners catching up to the top 25 per cent between 2003 and 2019, with improvement among the top 25 per cent substantially slower than among the bottom 25 per cent (Mullis et al. 2020). These gains in equality should be celebrated; but unfortunately, the pandemic erased many of them (Böhmer and Wills 2023) (also see Figure 7). How permanent this will be is yet to be seen.

Figure 5: Percentage of learners reaching the low international benchmark in PIRLS 2006 and 2016, by language,



Note: error bars depict 95% confidence intervals; learners tested in Grade 4.

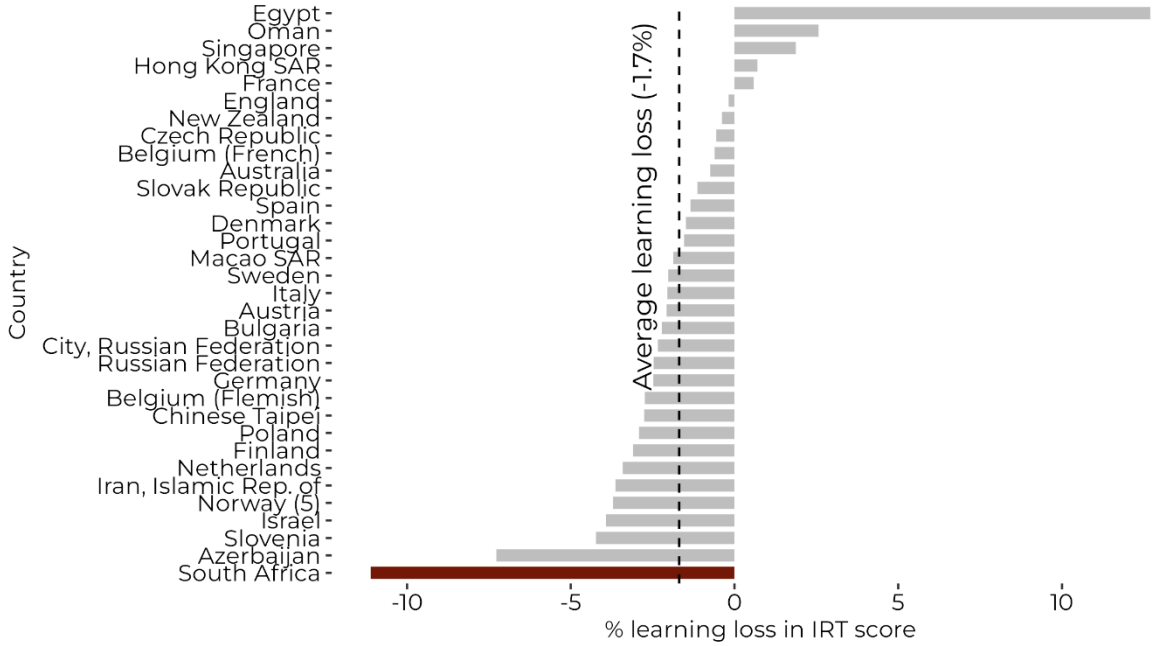
Source: reproduced with permission from Mohohlwane et al. (2023: 176, Figure 7.2).

3.3 Pandemic learning losses

A pre-Covid slump in the Grade 5 TIMSS maths results occurred between 2015 and 2019 (Spaull et al. 2022), followed by significant pandemic learning losses (see Period 3 in Figure 3). These losses were largest among PIRLS participating countries, as illustrated in Figure 6, which compares reading learning losses in PIRLS. As South Africa started on the lowest learning level of the participating countries and experienced the largest score reduction, the percentage learning loss was particularly substantial. These are the only available nationally representative, psychometrically valid assessment results from before and after the pandemic. The IEA cautions against direct attribution of the changes to Covid-19, yet it maintains that the results are comparable between countries and over time. There are some concerns regarding the validity of PIRLS testing during the pandemic, potentially invalidating international comparison, and some authors prefer local analysis that finds more moderate learning losses (Ardington et al. 2021; Schady et al. 2023).

South Africa's improvements in education equality also appear to have been eroded. Historically, learning inequality was in line with what would be predicted by the country's learning level (see Figure 7). However, the 2021 results show that the level of learning inequality now exceeds what would be predicted by South Africa's average learning level. This likely reflects differential access to information technology and the heterogeneous teaching ability of parents when learning began to happen at home during the pandemic. It remains unclear how enduring the pandemic learning losses and deepening in inequality will be, or whether the system will recover swiftly.

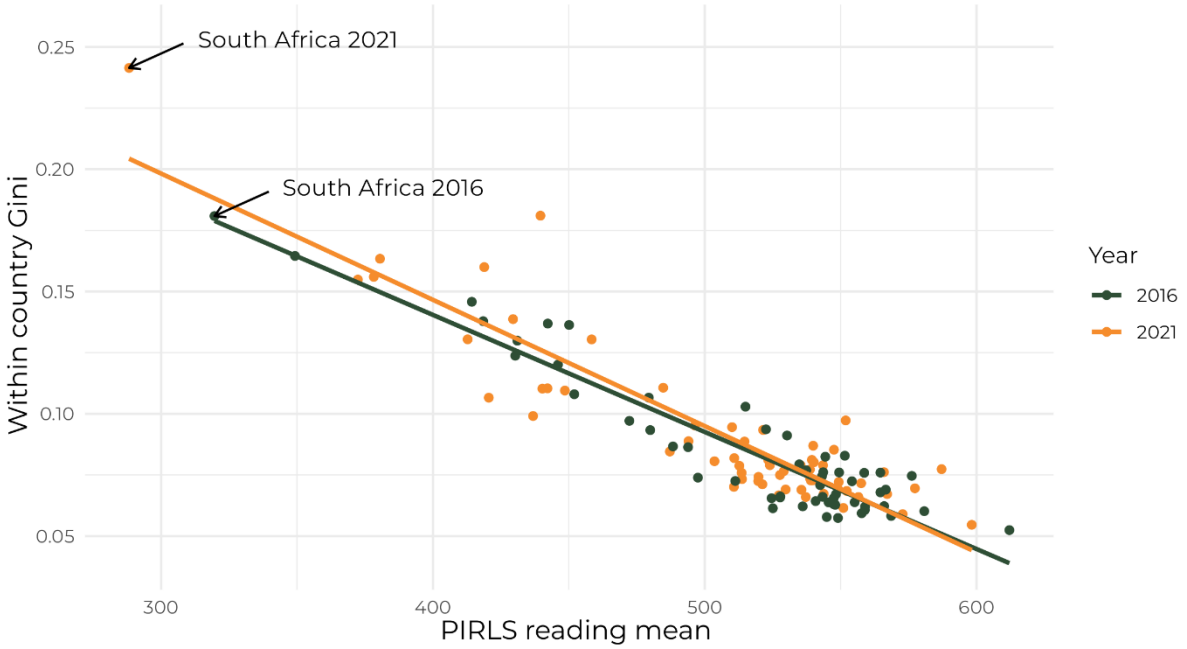
Figure 6: Percentage change in PIRLS Grade 4 reading outcomes between 2016 and 2021



Note: South Africa's decline of 0.04 SDs was nearly double the 0.23 mean but only the tenth largest; improvement is shown as a percentage of IRT scores, which are more intuitive than SDs; South Africa was assessed in 2022 at Grade 4.

Source: author's illustration based on Mullis et al. (2023).

Figure 7: Learning inequality vs learning level in PIRLS 2016 and 2021



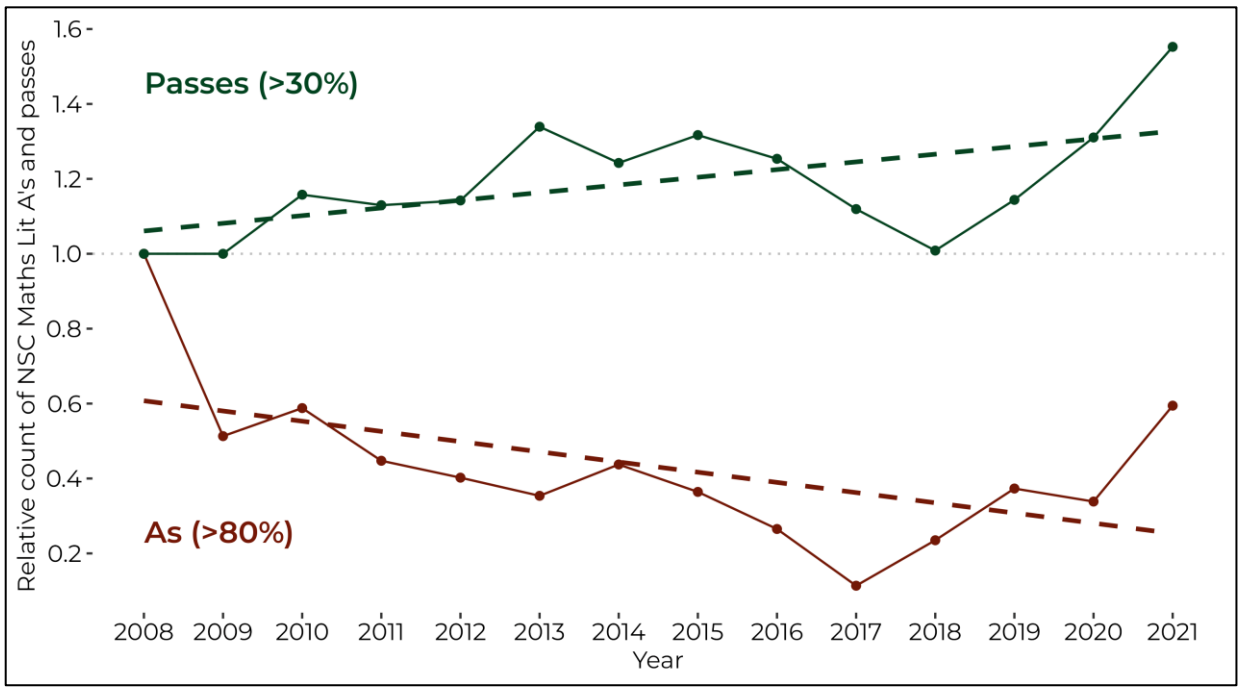
Source: author's illustration based on Böhmer and Wills (2023); Fishbein et al (2024).

3.4 Slow improvement at the top of the learning distribution

Returning to South Africa's period of rapid improvement, it is apparent that near the top of the learning distribution, progress has been slower. This is of concern in the context of rapid growth objectives for higher education, but also because high-level skills and know-how are critical for economic growth, technical progress, modernization, public administration, and fiscal resources. A robust education system must generate the high-level capacity needed for its own reproduction, for economic development, and to produce the incomes and tax revenue required to sustain social progress and improved living standards.

Several indicators suggest relative stagnation or decline in learning at the top of the distribution. Figure 8 shows that while the number of NSC mathematics literacy passes has increased, the number of As achieved has declined. A similar pattern is observed in NSC mathematics. Although a pass at the 60 per cent level is the minimum for entry to most STEM university programmes, higher achievement is strongly associated with academic excellence and critical capabilities. Declines or slow growth in learners achieving top grades has occurred despite the increasing number of learners and total NSC passes. There is some uncertainty about the comparability of the NSC maths assessment over time (Gustafsson 2016b), but the trend is nonetheless concerning.

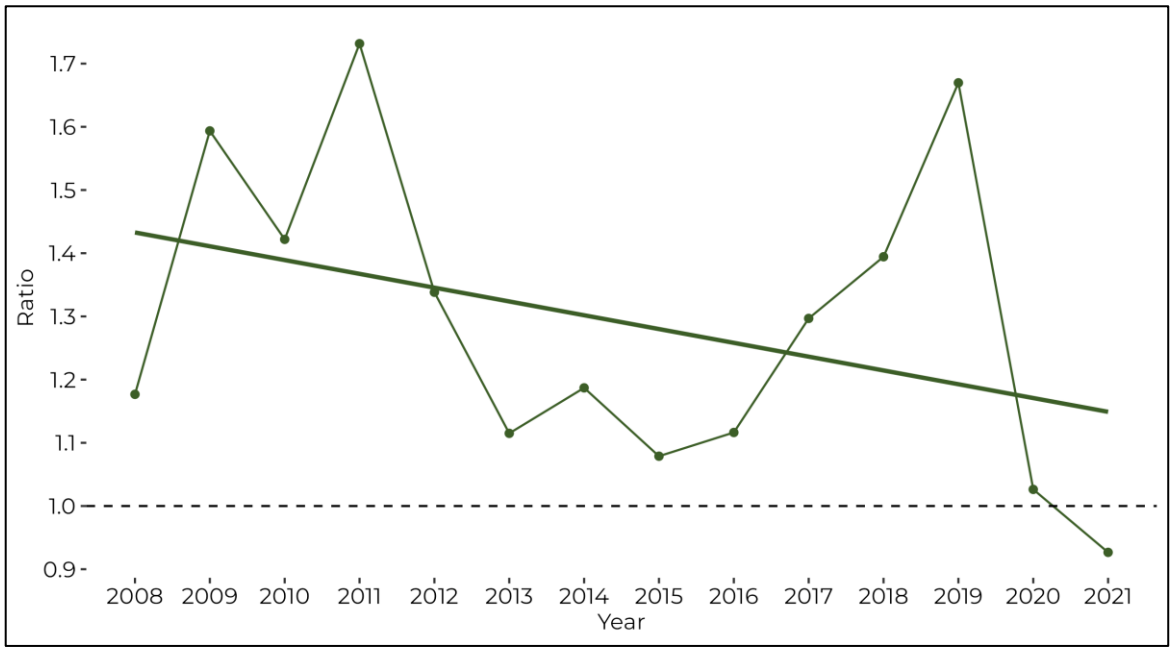
Figure 8: NSC mathematics literacy passes (30%) and As (80%) relative to 2008



Source: author's illustration based on DBE (2023).

Perhaps of greater concern, NSC results indicate that the distribution of maths As (and of distinctions in other subjects) remains concentrated in a small number of schools. The top 200 high schools (less than 4 per cent of the total) produce over half of all NSC maths As. Figure 9 shows that there has been some decline in the proportion of As accounted for by these top 200 schools, but the underlying data indicate that this effect is due more to a decline in the outcomes of the top 200 rather than increases in numbers of As in other schools. A broader distribution of high-level outcomes is to be welcomed, but the pattern remains highly unequal.

Figure 9: Ratio of NSC maths As (80%) in the top 200 schools to all other schools



Note: the horizontal dashed line is the point where the top 200 schools produce the same number of NSCs.

Source: author's illustration based on DBE (2023).

Although national learning levels have increased rapidly, whether these improvements resulted from addressing 'low-hanging fruit' is a concern. The School Nutrition Programme and Reading Workbooks appear to have been effective in improving broad-based outcomes. But raising learning levels near the top of the distribution might be more challenging. At this level, other constraints, notably teacher content knowledge, may be more binding (Shepherd 2015).

University completion rates suggest that many learners complete secondary schooling unprepared for higher education. Among full-time undergraduate students in three-year degree programmes, only 30 per cent graduate within the minimum timeframe and just 66 per cent complete their degrees within five years (DHET 2023). For a four-year engineering degree, only 24 per cent of students graduate within four years and 60 per cent complete within six years. Only 21 per cent of students who enrol for three-year science degrees graduate within three years (DHET 2023).

Public university education is heavily subsidized, and student financial assistance has increased sharply in recent years. Poor completion rates represent a substantial fiscal burden for the state, effectively raising the cost of higher education. There is also a substantial burden on learners and their families. Many students interpret a bachelor-grade NSC pass and admission to a university as signifying their readiness for higher education and adequate preparation to complete their degrees on time. That these expectations are often not realized represents a financial loss to families, who often support learners through their study years, and to students, who forgo employment opportunities. Non-completion also carries psycho-social costs that may cast long and debilitating shadows. Lastly, the fact that a matric or bachelor's pass often fails to lead to employment devalues education: the incentive to excel is reduced when students observe that many matriculants endure unemployment. Narrowing the gap between school outcomes and post-school education requirements must be a key element in education reform and enhancement of outcomes.

3.5 Teaching at the right level

The problem of low university pass rates in South Africa cannot be attributed solely to universities. Rather, low university throughput and ultimately employment are likely caused by poor basic education, particularly in the foundation phase (Heckman and Masterov 2007). Internationally comparable assessments show that even the top percentile of South African students perform poorly relative to international standards. For example, the top 5 per cent of Grade 9s in TIMSS maths score 527 points, only 7 per cent above the median of all other participating countries (that write the assessment in Grade 8) (Mullis et al. 2020).

This problem extends back to foundational literacy and numeracy, which are strictly hierarchical subjects. For example, learners cannot grasp 'comprehension' without 'phonics' or 'calculus' without 'algebra'. Foundational maths and reading are exceptionally poor. Only 16 per cent of learners reached the low international benchmark in maths in Grade 5 in TIMSS 2019, an assessment set for Grade 4 learners. Likewise in reading, only 19 per cent of Grade 4 learners reached the low international benchmark in PIRLS 2021. Educators in higher grades receive students who lack the prerequisites for understanding the material required in these grades.

The recognition of the hierarchical nature of learning has driven the rapid expansion of programmes like Teaching at the Right Level, which often stream learners within or between schools (Angrist and Meager 2023). These programmes benefit both the brightest students, who excel in a high-achievement environment, and weaker students, who receive instruction more appropriate to their learning level. Most educators have classes too large to cater to multiple levels of instruction and thus often teach to the median or higher achievers, clearly disadvantaging the lowest-performing students. Streaming enables learners to engage with material suited to their readiness, enhancing their ability to process and understand new information (Bradley and Green 2020).

Focus schools and remediation schools, particularly in large metropolitan areas where specialization is feasible, offer one possible pathway to improving learning outcomes for all students. This is consistent with the marginal benefit approach outlined above, which recognizes that learners' needs vary and so improvements require various kinds of intervention. Establishing focus schools or creating opportunities to access high-functioning schools requires fair processes for identifying gifted learners, possibly through summative assessments or educator and principal recommendations. Initiatives of this kind should be complemented by strategies for expanding and strengthening high-functioning schools, perhaps linked to well-targeted school transport programmes.

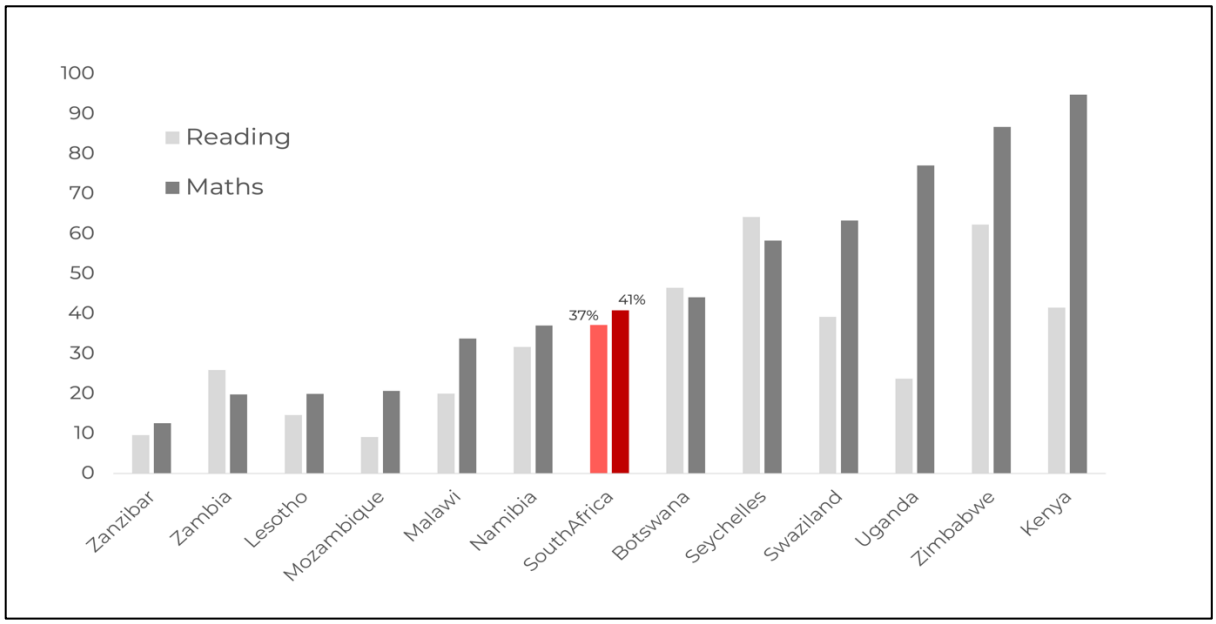
Much can be learned from countries that have undertaken education system improvement programmes. Poland's progress between 2006 and 2011 is particularly interesting because it was achieved from an already high base. Vietnam is perhaps more relevant to South Africa, given its divisive and violent history and a base of initially poor learning outcomes. Now, Vietnam outperforms Norway and the United States in PISA (Programme for International Student Assessment) maths (OECD 2022). Understanding how system-level improvements occur may be more important than localized interventions, which often cannot be scaled up.

Part of Vietnam's solution includes 'Schools for the Gifted', sometimes affiliated with universities. They provide guidance and specialized programmes, particularly in science and mathematics, for learners identified through national summative assessments. These schools also create considerable incentives for primary school learners to excel and gain admission to better high schools. Competitive incentives can operate in various ways—between schools, between educators, and between learners. System improvements often rely in part on strengthening

competitive mechanisms, though the need to meet diverse education needs fairly and equitably must remain a primary consideration.

Finally, educator content knowledge and subject mastery is perhaps the most significant binding constraint on basic education in South Africa. As illustrated in Figure 10, only 37 per cent of Grade 6 reading educators have mastery of their subject, while 41 per cent of maths teachers do. This puts South Africa behind much poorer countries such as Zimbabwe and Uganda.

Figure 10: Percentage of Grade 6 educators attaining mastery in mathematics and reading in SACMEQ 2013



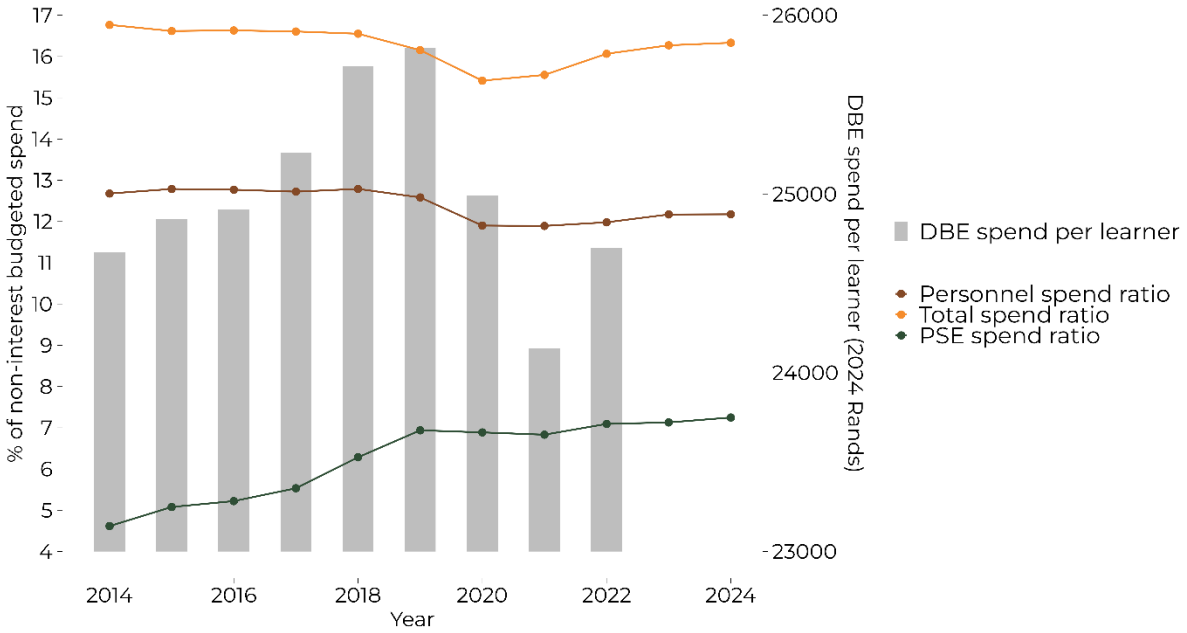
Source: author's illustration based on Awich (2021).

3.6 Fiscal environment

South Africa's national expenditure on basic education has remained around 16.5 per cent of non-interest expenditure over the past decade (see Figure 11). In contrast, the post-secondary education budget increased from 4.6 per cent to 7.2 per cent of non-interest expenditure between 2014 and 2024, reflecting a dramatic 56 per cent rise in the post-secondary spending share. This increase was primarily driven by adjustments to student financial assistance following the FeesMustFall protests. Real spending per basic education learner has remained fairly stable, peaking at around 26,000 rands (R) in 2019 and dropping to approximately R24,000 in 2021, influenced by both enrolment trends and changes in total expenditure.

As noted in Section 2, while education is an important driver of growth and better employment opportunities over the long term, education progress is constrained by the resource challenges of a slow-growing economy. South Africa has experienced two distinct periods in recent times. From 1998 to 2008, there was rapid economic and employment growth, enabling resource allocations for education to keep pace with enrolment increases and investment in institutional capacity. Since 2008, growth has slowed to below the rate of population increase. Education system improvements and expanded opportunities have had to be sought within an increasingly constrained resource envelope. In exploring policy options for education progress in Section 4 below, it has to be assumed that the fiscal constraint is unlikely to ease in the near term. Consideration is therefore given, for the most part, to reforms that might be implemented without overall increases in education expenditure.

Figure 11: National education expenditure as a percentage of non-interest expenditure and DBE spend per learner



Note: unbudgeted wage bill negotiations are not accounted for in the figure.

Source: author's illustration based on DBE (2016–24); National Treasury (2014–24).

3.7 Employment of educators

The largest cost driver in education is teachers' salaries. Since 2007, average educator salaries have increased by 66 per cent above inflation (Sachs et al. 2022). This rise was partly due to the OSD for educators. Between 2012 and 2021, average educator salaries rose from R37,600 to R43,000 a month (in 2021 rands). For perspective, the average income of the ninth decile of South Africans was R38,000 a month in 2021 (Jacobs et al. 2024). South African educators are paid five times GDP per capita, whereas no OECD country has a multiple larger than twice GDP per capita, with the average just slightly above GDP per capita (OECD 2011). South Africa is also unusual in having a common pay scale for primary and secondary educators.

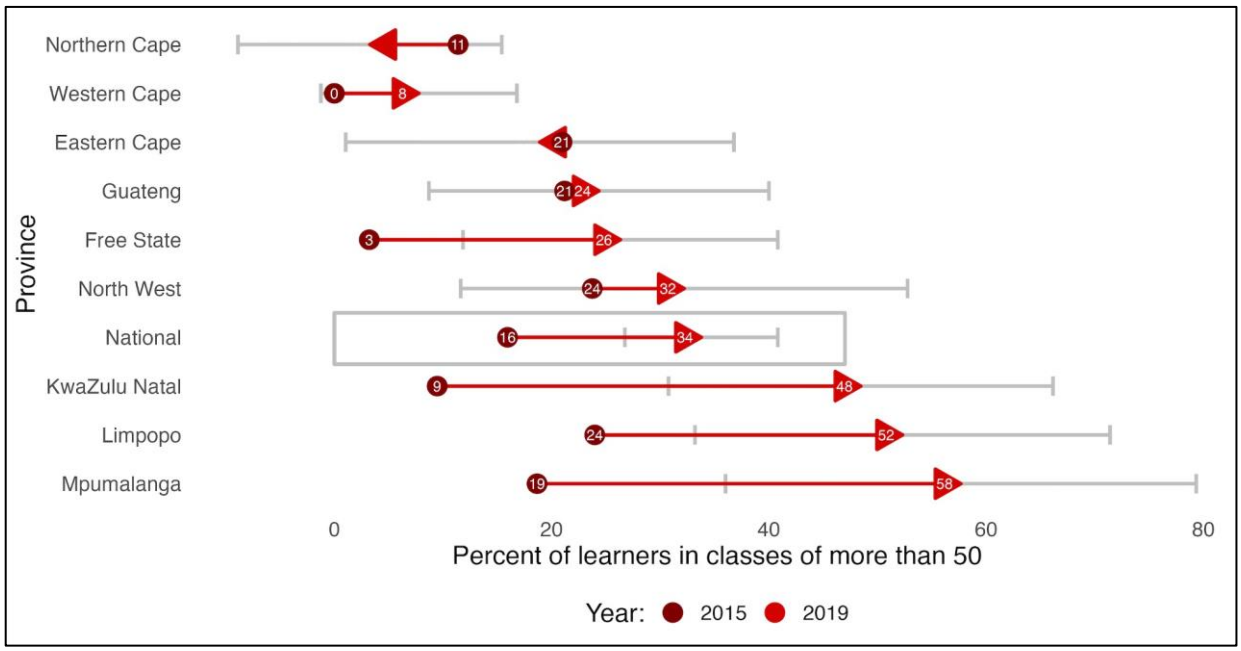
In principle, by remunerating teachers well, South Africa should attract more competent personnel into its schools. While this might be right over the long term, international evidence does not suggest that there is a straightforward relationship between salaries and learning outcomes (Bau and Das 2020; de Ree et al. 2015). Given the overall budget constraint, there is a trade-off between teacher salary levels and learner–educator ratios (LERs). As a policy consideration, it seems clear that efforts to ensure that teachers are well trained and schools are well managed are important complements to maintaining a well-remunerated teaching force.

Approximately half of South Africa's educators will retire over the next 15 years (van der Berg and Gustafsson 2020). Refreshment of the teaching force through this period of high turnover is perhaps a once-in-a-generation opportunity to promote improved teaching and learning and improved allocations of personnel. One element of this is the opportunity to improve LERs. The

LER is important because of class size, not because of the abstract number of educators for every learner at a national level.[4] However, the relationship between the LER and class sizes is complex.

Nationally, between 2018 and 2021, the number of learners for every educator increased from 28.9 to 29.4 while class sizes declined from 42.8 to 40.5 in Grades 1–7 (excluding the Eastern Cape and Western Cape). These efficiency improvements are vital for the transition to higher national LERs. Yet this is also occurring in a period where certain cohorts are experiencing exceptionally large class sizes, such as in Grade 5 maths (see Figure 12).

Figure 12: Percentage of learners in mathematics class sizes greater than 50, by province, 2015–19 (TIMSS Grade 5)



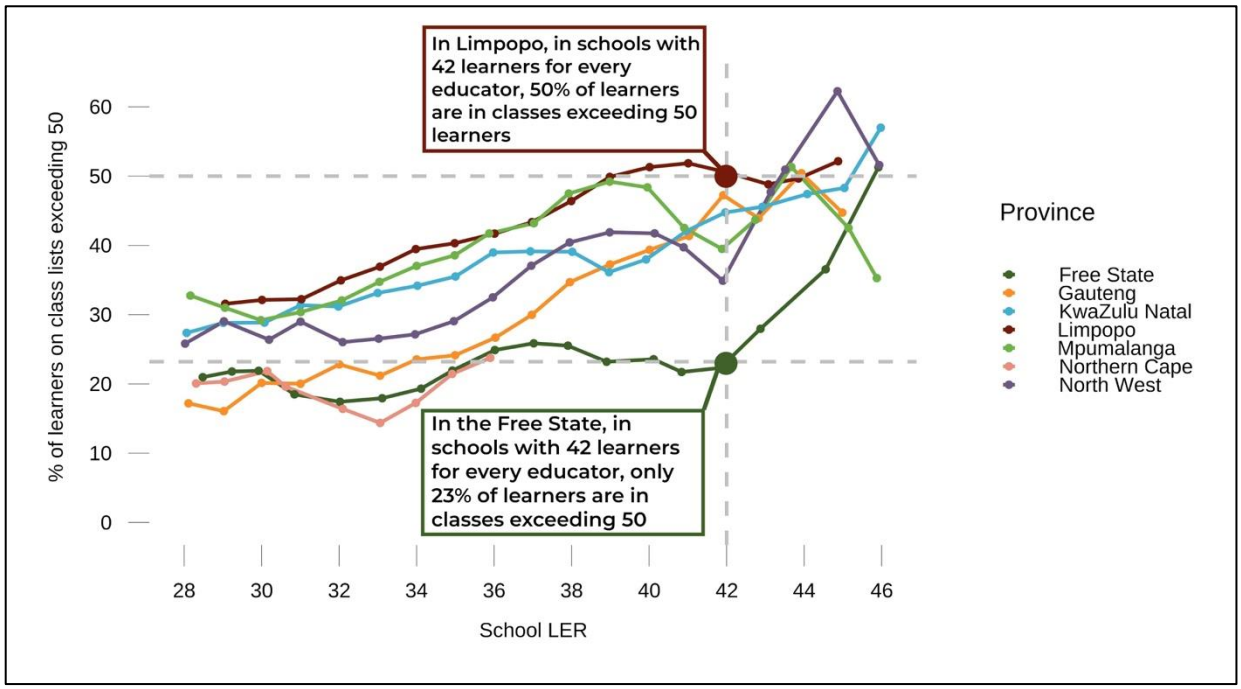
Note: error bars represent 90% confidence intervals.

Source: author's illustration based on Mullis et al. (2023).

There is considerable variation between provinces in educator allocation efficiency. For example, in the Free State, in schools with an average LER of 42, only 23 per cent of learners are in classes of more than 50 students. In contrast, in Limpopo, 50 per cent of learners in schools with an average LER of 42 are in classes of more than 50 learners (see Figure 13). This variation suggests that more efficient allocation of educators and learners is achievable, as evidenced by some provinces.

[4] It is worth noting that there are limited or negligible effects of class size on learning outcomes in South Africa (Altinok and Kingdon 2012) and other African countries (Duflo et al. 2015). Reducing class size matters more for reasons of human rights and dignity. Yet, this also suggests that attention should be paid to improving classroom infrastructure, i.e. larger classrooms, in conjunction with class size reductions (Datta and Kingdon 2023).

Figure 13: Percentage of learners in classes exceeding 50 for a given LER



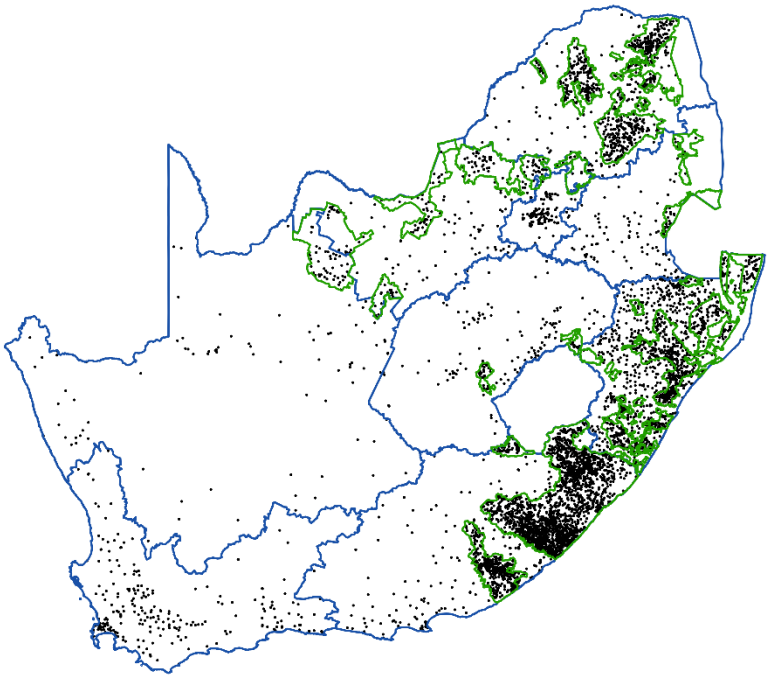
Source: author's illustration based on DBE (2021a).

Multigrade schools—schools where there are more grades than educators—are also inherently inefficient. In these schools, multiple grades are taught in the same classroom, or overall teaching time is reduced, with multiple teaching shifts in the day, such that each class is taught only with learners of their own grade. Effective pedagogy requires teaching at the appropriate level and teaching an appropriate amount per day. This is infeasible in multigrade settings. Further, due to post-provisioning norms, these small schools are each allocated a principal and have more educators than the national average. This places a disproportionately large strain on the national educator wage bill.

Over 5,300 schools in South Africa are multigrade. Most of these are in the former homelands, and many are in rural areas that have experienced depopulation. Multigrade schools are likely to be characterized by infrastructure shortfalls and administrative neglect. There are 270,000 learners in multigrade schools in the Eastern Cape, 160,000 in KwaZulu-Natal, and 130,000 in Limpopo (see Figure 14).

The 'last mile problem' exacerbates resource allocation issues due to these small multigrade schools. That is, the resources needed to deliver a good or service the last mile can cost nearly as much as the resources to get that good or service almost the entire way. This puts an exceptionally large strain on budgets, for example in provisioning internet cables, repairs, or fundamentally any other service delivery to these schools. As most of these schools are in areas with poor road infrastructure, these logistical considerations are significant. This may be part of the reason it has taken so long to eliminate pit latrines, for example.

Figure 14: Locations of South Africa's 5,359 multigrade school



Note: green outlines show the boundaries of the former homelands.

Source: author's illustration based on DBE (2021a, b).

Part of the solution is to close schools in communities where learner numbers are declining and transport to alternative schools is more cost-effective. On average, multigrade schools are 2.2 km from the nearest alternative, allowing for consolidation in many cases within walking distance of learners. High enrolment volatility in these schools suggests that learners frequently change schools, indicating that closures may not hinder access (Gustafsson 2016a). Local resistance to closing schools is sometimes experienced, and the required administrative procedures are time-consuming. Coordination between district planning offices, municipalities, and education authorities may need to be strengthened to make progress in this area. Nonetheless, the Free State has experienced substantial success in closing schools, closing more than a third of all schools since 2009.

3.8 Trends in post-secondary education and training

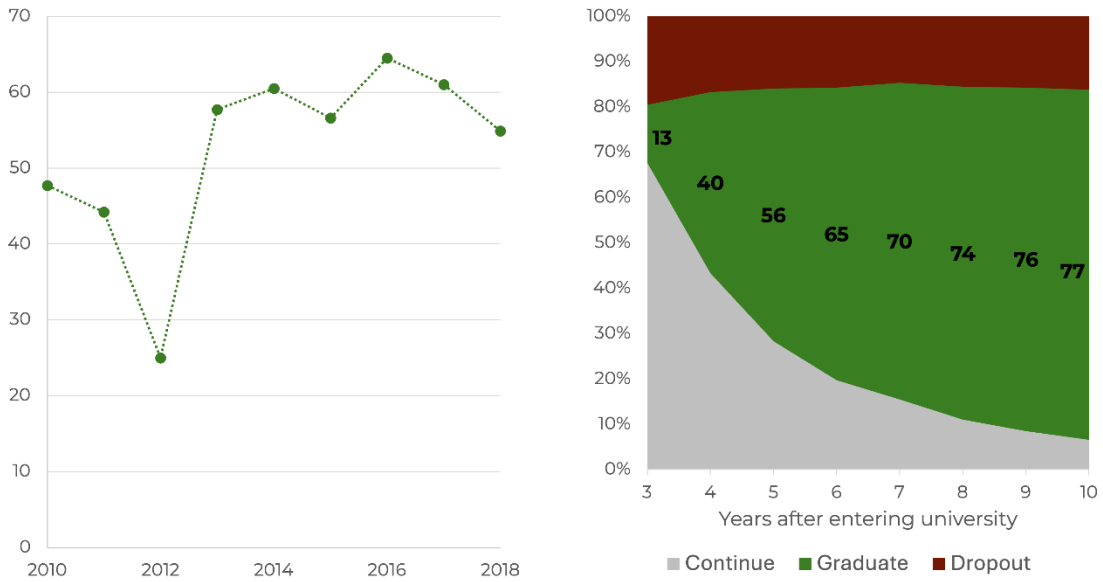
A significant change in the education landscape over the past decade has been the increase in university and college learner funding through the NSFAS, accompanied by curtailment of institutional and infrastructure funding and a slowdown or reversal in student admissions growth. Whereas in the past the NSFAS was able to finance its assistance programmes in part through the flow of loan repayments, student awards are now mainly grants.

The underlying intent has been to ensure that affordability considerations should not constrain access to further education. Although initially driven by campaigns for fee-free higher education, the resulting interventions were to restrict annual fee increases by universities, partially offset by adjustments to university subsidies, to increase the household income thresholds applicable to NSFAS student assistance, and to replace loans with grants. Mindful of the overall resource constraint, the DHET aims to develop a more sustainable fees policy in consultation with higher education institutions. Long-run expenditure projections by the National Treasury caution that fee increases need to be aligned with education-specific inflation if the increase in spending on

university education is to be kept within realistic bounds. A hybrid funding model, proposed by the Davis Committee, is explored later in this report.

A rising proportion of higher education and college students receive NSFAS grants, but the evidence on student performance is cause for concern. The NSFAS awards funding for the normal duration of the degree or diploma programme (three or four years) plus two additional years. But 45 per cent of recipients do not graduate within five years, and 35 per cent do not graduate within six years, the legislated maximum receipt period (see Figure 15). Historically, a 'long tail' of learners has remained enrolled in the NSFAS even ten years after first receipt (de Villiers et al. 2013). (No data is publicly available on recent trends.) In effect, universities are rewarded for admitting students who will not complete their studies or may be poorly suited to their curriculum choices. NSC and NBT results and more targeted aptitude tests are available as predictors of students' probabilities of success. But institutions are, in effect, incentivized to ignore the evidence. Figure 15 illustrates that after 2010, there was a positive trend in the fraction of NSFAS recipients graduating within five years but that since 2016, this trend has turned negative.

Figure 15: NSFAS graduation trends



Note: the cumulative number of dropouts declines in the original data: this is theoretically impossible unless rejoining dropouts are not counted as new entrants but removed from the count of dropouts; these data follow learners who at some point received the bursary: this does not imply that they continue to receive the bursary in the years given.

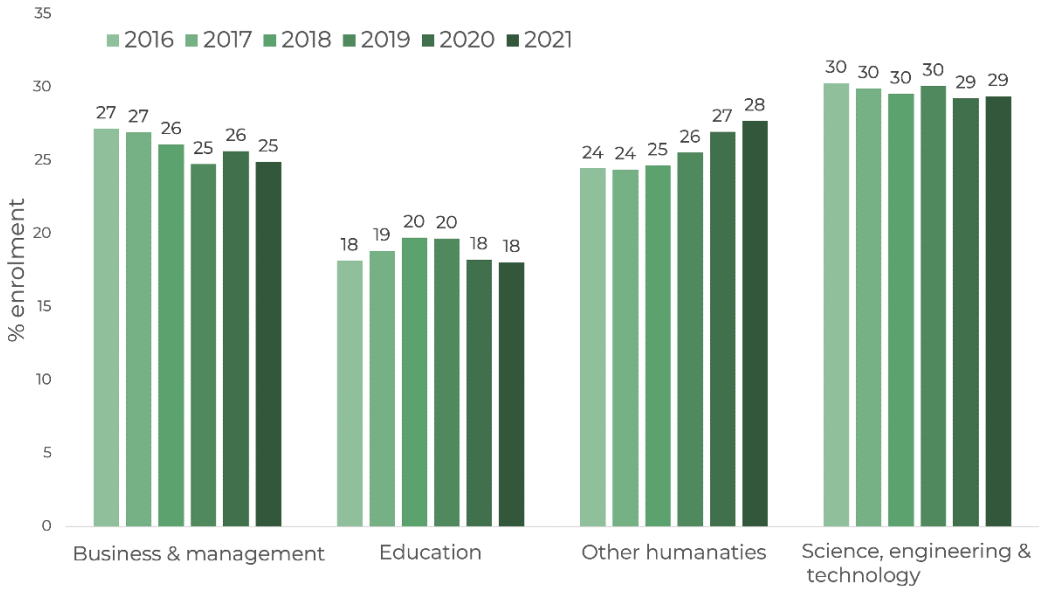
Source: author's illustration based on DHET (2023).

Funza Lushaka (education bursary) recipients enjoy a much higher rate of graduation. After five years, 66 per cent have graduated. However, there are concerns about assurance of teacher qualification and content standards across institutions. External moderation of education programme outcomes and teacher entrance readiness assessments would address these concerns.

Breakdowns between the main categories of university enrolment from 2016 to 2021 are illustrated in Figure 16. Approximately a fifth of university students were enrolled in education programmes. Declining shares were enrolled in business or management courses and in science. Engineering and technology and humanities (other than education) took up a rising share. This is arguably not a trend that accords with South Africa's skills and vocational needs—the returns on investment in

science, engineering, and technology are higher than in other fields. More detailed analysis is called for here, taking into account market trends and recent findings of South Africa's Labour Market Intelligence project.[5]

Figure 16: Percentage university enrolment in CESM categories, 2016–21



Source: author's illustration based on DHET (2021).

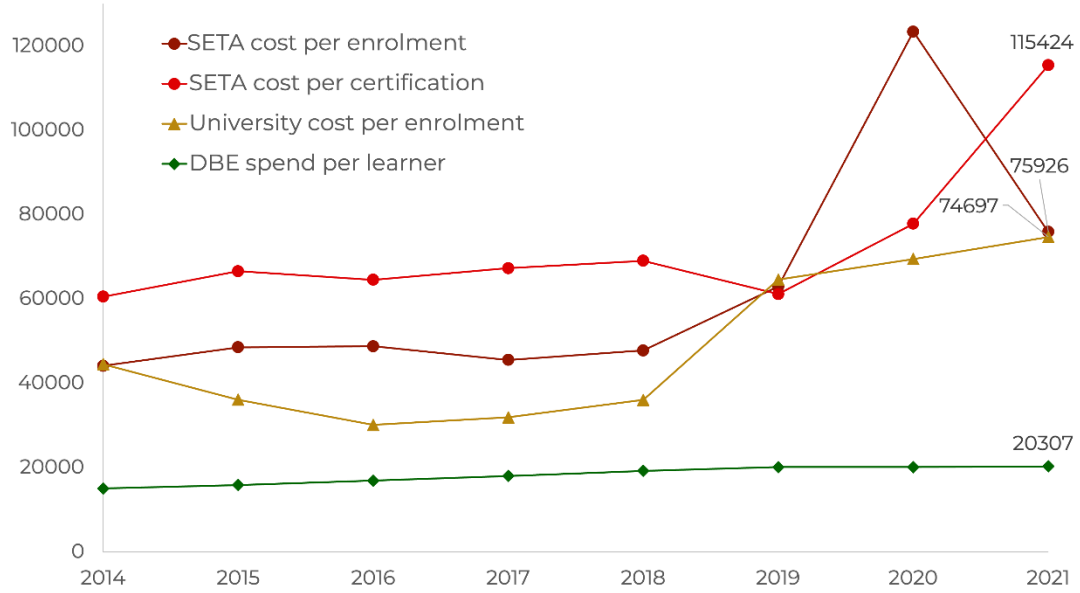
Figure 17 compares the costs of learners in SETAs, funded by the SDL, university students, and basic education learners from 2014 to 2021. It shows that a year of university education is typically less costly for the country than a year of learning in an SDL institution. In 2021, the cost per learner enrolled in a SETA was R75,926 while the cost for university enrolment was R70,174. This discrepancy is notable, given that SETA courses generally consist of fewer full-time equivalent units than university or college programmes. Moreover, SETAs rely on a diverse range of training institutions which lack the costly institutional and research responsibilities of universities.

Although the SETAs and the NSF account for substantially larger expenditure than the TVET college sector and training courses are subject to the regulatory oversight of the QCTO, there are widespread concerns about their effectiveness, the administrative overhead costs, and the quality of SDL-funded programmes (DNA Economics et al. 2016). Although SETA and NSF funds have been diverted to train unemployed work-seekers in recent years, there is little evidence of positive employment benefits. With 21 SETAs organized across sectors rather than regions or occupational groups, there are extensive overlaps in their activities and the system appears deeply inefficient. Additionally, the tracer studies proposed by the DHET to follow SDL learners and determine their employment outcomes have not materialized. An in-depth reconsideration of the skills development funding system and the role of SETAs appears to be warranted, considering the

[5] Under the auspices of DHET's Labour Market Intelligence project, a biennial National List of Occupations in High Demand is published. The most recent publication in this series (Khuluvhe et al. 2024) lists 350 occupations (out of a total of 1,410) together with their associated qualification requirements.

constrained resources of TVET colleges and the need to deepen the quality of vocational education programmes and improve their relevance and effectiveness in relation to the needs of employers.

Figure 17: SDL and university cost per enrolled and certified learner (R per year)



Note: values are in nominal rands.

Source: author's illustration based on DHET (2021b).

SETAs and the NSF are funded through the SDL, paid by employers and calculated as 1 per cent of remuneration. The public service, religious and charitable organizations, and businesses with a payroll of less than R500,000 a year are exempt. This is, in effect, a tax on earned income that is administered outside the national budget and expenditure planning system. Although it is paid by almost all employees, few benefit. As a tax on earnings even below the personal income tax threshold, not offset by accompanying social security benefits, it is hard to reconcile the skills levy with its employment-disincentivizing effect. To place this in context, the employment tax incentive provides tax rebates for certain forms of employment, yet it only incentivizes employment by R6 billion a year (2021/22). In contrast, the SDL disincentivizes employment by R19 billion a year (2021/22) (National Treasury 2021). Consideration should be given to comprehensive reform of the vocational education and training financing arrangements.

4 Education reforms and policy options

The DBE and the DHET have long histories of ambitious policy goals. This section consolidates the policy proposals that are best suited to unleashing economic growth and employment, in line with Operation Vulindlela's ambitions.[6] The proposals additionally draw on local and international education research. These policies are aimed at increasing university throughput (focusing on foundational literacy and numeracy) without jeopardizing broad-based learning improvement.

[6] Operation Vulindlela is a joint initiative of the Presidency and National Treasury to accelerate the implementation of structural reforms and support economic recovery. It was involved in the commissioning of this report.

They carefully consider the fiscal envelope within which education must be budgeted for, with several proposals for rationalization. This report particularly draws on eight notable national education policy reviews: DBE (2015, 2020a, b); Dell Foundation (2013); Deloitte (2013); DHET (2021); National Planning Commission (2012); OECD (2008); and van der Berg and Gustafsson (2017).

4.1 Basic education

National Diagnostic Assessments

Assessment of national learning achievement has been a focus of education reform proposals for many years. Indeed, the NDP (National Planning Commission 2012) set national assessments as a cornerstone policy that would provide parents and communities with the information they needed to empower their children in their learning journey. Since 2011, assessment reform has featured, among other places, in the following:

- DBE Strategic Plan 2011–2014 (DBE 2011);
- National Development Plan (2012);
- Action Plan to 2019 (2015);
- Action Plan to 2024 (2020);
- Revised Strategic Plan (2020).

For several years, ending in 2015, the DBE managed a series of ANAs, comprising standardized literacy and numeracy tests. There were several shortcomings to these assessments, including testing at too high a level, leading to inadequate psychometric validity (DBE 2016). Further, there was substantial union resistance to the assessments. This was potentially due to the fear that accountability measures would be inappropriately attached to the performance of an educator's learners in the ANAs. The lessons of the premature termination of the ANAs must be carefully considered in revising national assessment policy. Nonetheless, in the 2017 SMS, three-quarters of teachers and principals supported the introduction of national examinations in Grade 6, demonstrating greater educator demand for assessments than may be widely accepted.

The ANAs have been discontinued in favour of the NIAF, though implementation of this updated framework has been slow. Institutional constraints suggest that South Africa is not yet ready for a comprehensive summative assessment programme like the ANAs, though the recently introduced GEC at the end of Grade 9 is effectively a pilot. Diagnostic assessments are the first step towards implementing the NAIF.

Diagnostic assessments, also known as formative assessments, provide educators with CAPS-aligned, quality-controlled, and centrally produced assessment instruments. The DBE should create these high-quality assessment instruments to enable educators to assess their learners, in order to better understand learning deficiencies and learner alignment with the appropriate grade and curriculum. These assessments would provide formulaic feedback such as 'this Grade 5 learner is reading at a Grade 4 level' to provide plain-language feedback to the learner, the educator, and the parents, as suggested by the NDP (2012).

Importantly, centrally produced diagnostic assessments would reduce the burden on educators to create unique yearly assessments for their learners, meeting the dual policy imperatives of improving education efficiency while maintaining educator and union buy-in. This would follow the widely lauded successes of the DBE's Rainbow Workbooks in providing national, high-quality learning and teaching support materials.

Through providing a bank of assessments structured for detailed feedback, aligned to the national CAPS, and focused on the key subjects of language and mathematics, the burden on teachers of drafting test instruments would be eased. Learners, educators, and parents stand to benefit from information on learning levels achieved and learning needs, assisting in syllabus-focused lesson planning while providing information to guide learning and future study or career choices. Diagnostic assessments at regular stages of the school year would provide learners with feedback at a topic level.

Systemic evaluations: A systems-wide performance thermometer

Rigorous assessments are an important 'performance thermometer' to inform planning and policy for the education system. Systemic evaluations assess a nationally representative random sample of learners in Grades 3, 6, and 9 in language and maths using assessments that are psychometrically comparable between provinces and over time. One cannot improve that which is not being measured. South Africa currently has no high-frequency measurement of learning performance in the key subjects of language and maths. The Western Cape has had significant success in implementing such assessments. Although there is currently no political scope for universalizing systemic evaluations to all learners since the discontinuation of the ANAs, systemic evaluations provide an important stepping stone towards summative assessments.

South Africa participates in a number of international large-scale assessments: TIMSS in maths and science, PIRLS in reading, and SACMEQ in maths and reading, recently extended to include understanding of HIV. These provide useful measures of progress, but South Africa needs a higher frequency of anonymous assessments across the Grades (3, 6, and 9) to better understand the health of the education system. Importantly, these assessments would allow the education system to refocus on foundational literacy and numeracy, where the current Grade 12 NSC receives almost all of the attention as the indicator of the performance of the education system. The systemic evaluation could be coupled with current school-level data collection, such as the School Monitoring Survey, to reduce the burden on schools and to minimize the costs of implementation.

In the longer term, the aim should still be to implement comprehensive summative assessments earlier than the Grade 12 NSC. These would assist in tracking progress towards equity by highlighting disparities within and between schools and at all basic education levels. They would provide more objective benchmarks for progress for all learners and would catalyse parental and community engagement while providing a framework for accountability at all levels and grades. System-wide assessments also assist in aligning educators with the syllabus and providing the information infrastructure for school report cards and selective school placements. They would serve to motivate student achievement at younger ages and support streaming and other improvements towards 'teaching at the right level'.

Professional licensure of educators: A commitment to competence

It is widely recognized that inadequate teacher content knowledge is a central problem of South Africa's education system. A robust and centrally administered entrance exam should be a requirement to become an educator. This would either complement the BEd and PGCE or replace these requirements in limited circumstances. In the case of replacing an education qualification, those wishing to become educators would need a university qualification relevant to the subject they are to teach. Requiring an educator entrance examination would place top-down pressure on education degree quality.

Careful consideration needs to be given to the focus of such a professional examination, taking into account the fact that educator mastery of maths and language is likely a more binding constraint than educator pedagogical knowledge.

The NDP calls for competency assessments prior to principal appointments (Action 59). The DBE reiterates this commitment in the Action Plan to 2024. The political appointment of principals is particularly pernicious. Professional examinations would mitigate the harms of this problem.

Teacher entrance examinations are practised by about a fifth of all countries (UNESCO Institute for Statistics 2023). Examples include India's Central Teacher Eligibility Test, Nigeria's Professional Qualifying Examination, and Ghana's Teacher Licensure Examination. The importance of educator content knowledge has been widely demonstrated by domestic and international evidence (Shepherd 2015).

Aligning educator pay and performance: Enhancing teacher performance, incentivizing excellence, and attracting top talent

Although educator compensation comprises 10 per cent of the South African budget, there is little political scope to reduce it. The OSD pay progression notches were introduced to incentivize educators to perform and to retain the best-performing educators. However, the status quo is near-universal notch progression, which has, in part, led to the 66 per cent increase in average educator compensation above inflation since 2007.

Older educators have the lowest content knowledge (van der Berg et al. 2016). Consequently, universal notch progression has the opposite of its intended effect; it incentivizes the least competent educators to remain—those who have taught the longest. Content knowledge is the significant capability shortfall, and it is unclear whether teacher training can improve this. As such, notch progression must be tied to performance.

This should be done either through measured learner performance (which can have unintended consequences) or through performance reviews by principals or district officials (where there is a fiscally proscribed scope for notch progression). Pay progression is important, but it is also important that the OSD entrance notch should be sufficient to attract capable candidates into education. Other aspects of the conditions of employment and the work environment are important elements in attracting and retaining the best possible teaching force.

Expanding the capacity and accessibility of high-performing schools

To strengthen the quality and depth of South Africa's through-flow from schools to higher education and colleges, consideration should be given to the role of high-performing focus schools—both to expand the numbers they enrol and to provide merit-based access paths from neighbouring community schools. This aligns with 'teaching at the right level' and should be complemented by formalizing streaming within schools (the practice of grouping learners by learning level).

While the case for focus schools is not limited to this, constraints in the availability of maths teaching capabilities are a key underlying pedagogical assumption:

- Advanced subjects such as robotics, coding, and entrepreneurship, emphasized in the DBE Action Plan (2022), are predicated on a level of maths proficiency that is unattainable in the short term.

- Universities experience high dropout rates in technical subjects in part due to inadequate maths and science skills.
- Mathematics remains the learning foundation of the Fourth Industrial Revolution, as evidenced by the focus on maths in leading industrial nations.

Various approaches could be taken to expanding access to both public and independent high-performing school opportunities, drawing on models adopted in other countries.[7] Selected schools could serve as magnet schools of excellence, admitting gifted learners from local communities identified by their educators and admitted through appropriate assessments. This accomplishes several goals by providing learners who may otherwise have fallen just short of ultimately completing university with the basic education skills required to do so.

This process additionally incentivizes learner performance by giving learners a mid-point goal in their education journey: admission to a focus high school. With the NSC exam far in the future for many learners and with weak employment prospects upon completion of the NSC, providing incentives for learning performance could have a multiplier effect beyond the learners who are ultimately selected.

Lastly, although selective schools are unlikely to have substantial benefits at the middle or the bottom of the learning distribution, they may still have an outsized equity impact. Providing gifted learners from poorer communities with access to South Africa's centres of educational excellence can lead to prosperity for their families and serve as a model for other learners in their communities. This is particularly important in South Africa, where both political and private sector employment must legally be sensitive to the country's history of discrimination. Developing a pool of exemplary candidates in areas where human capital constraints exist is a crucial complement to affirmative action.

ECD quality assurance should precede ECD universalization

Currently, Grade R is being universalized and the addition of a Grade R-1 year is under consideration, though evidence supporting this expansion is limited and there is no reliable quality assurance mechanism in place.[8] Taking into account the costs involved, it is important to improve the evidence base for expanding pre-school enrolment and progressively measure outcomes as ECD is universalized. Working back from the evidence and from pilot programmes is likely to be more productive than mimicking policies adopted elsewhere.

Many countries have school readiness assessments, administered by Grade 1 educators. Tracking these results and staggering the rollout of pre-school programmes could provide vital information (including on the prevalence and effects of stunting, for example, and on different needs in different community settings). While norms and standards are clearly desirable, consideration must be given to the capacity available to monitor ECD and pre-school programmes appropriately.

Schools should not expand into Grade R without receiving certification that the school meets minimum requirements. This should include, among other things, teacher ECD knowledge verification, infrastructure standards, and adequate learning and teaching support materials. Universalizing Grade R reduces the time that young children have with their primary caregivers.

[7] Countries with focus school models of interest include Vietnam, Singapore, South Korea, and Kenya.

[8] The impact of universal or expanded pre-school programmes has sometimes been found to be negative, even in developed countries (Baker et al. 2008). Reduced caregiver exposure is a substantial risk factor.

Without comprehensive and time-tested quality assurance mechanisms for Grade R educators and ECD practitioners, there is inadequate evidence that replacing caregiver contact with ECD practitioner (or educator) contact will improve learning and life outcomes.

Implementing the comprehensive literacy plan

The comprehensive literacy plan set out in van der Berg et al. (2016) aims for all learners to read fluently and with comprehension by the end of Grade 3. This four-stage plan—Prioritisation, Preparation, Implementation, and Sustainability—targets six key dimensions: Beginning, Collaboration, Capacity, Accountability, Alignment, and Budget. Initially, it focuses on establishing a Directorate of Primary Literacy and branding the national reading strategy. Teachers receive specialized training on 'how to teach reading' and regular bi-annual feedback is provided to monitor progress. Collaboration with the DHET addresses system weaknesses and introduces new training courses. Independent assessments ensure that Grade 3 reading proficiency meets national standards.

Capacity-building involves auditing the education system to effectively teach early grade learners and training teachers to track reading fluency using the SA-SAMS. The plan emphasizes the importance of shared standards for reading in English and mother tongue languages, monitored through the SA-SAMS. Public awards are given to districts and schools that successfully implement reading strategies. Reformulating a national early grade reading strategy, training new reading specialists, and launching a public awareness campaign on early reading competencies are also crucial components. The budget analysis ensures adequate resources, the deployment of reading experts, and manageable class sizes. This structured approach aims to achieve near-universal reading proficiency by the end of Grade 3.

4.2 Post-secondary education and training

Recommendations for PSET are primarily drawn from the *National Plan for Post-School Education and Training 2021–2030* (DHET 2021a).

Higher education student finance reform

Against the background of the steep rise in budget allocations for student financial assistance over the past decade, consideration should be given to the recommendations made by the Davis Tax Committee (DTC). The DTC recommended that the capacity of South Africa's banking and financial services sector should be leveraged to ensure the sustainability and fairness of an expanded higher education funding model (Davis et al. 2016).

The proposed approach would take advantage of the administrative capacity of SARS for the repayment of income-contingent loans. Interest charges or capital reserve requirements on student loans could be subsidized to assist in ensuring affordability and fairness, with higher-income students paying full tuition fees supported by loans on commercial terms. A streamlined NSFAS would continue to support the poorest learners wholly.

Viewed more broadly, there is scope for blending general student financial assistance with industry or vocationally targeted support, recognizing the specific needs of sectors such as healthcare, education, financial services, municipal utilities, and construction. A more diversified approach to student finance is called for, recognizing the limitations of fiscal resources.

Post-school education: System integration and clarity of institutional roles

Several related institutional reform projects should be pursued over the period ahead. These are discussed under the numbered 'outcomes' of the PSET Plan (DHET 2021a).

Outcome 1.1: Clear streamlined roles and responsibilities of all key stakeholders. Though Community Education and Training (CET) College networks have been formally established in each province, their funding, enrolment planning, data systems, and curricular programmes are under-developed. Stronger engagement with local business and community organizations is likely to be a critical success factor, if community colleges are to contribute to employment and economic development. How CET colleges can utilize the existing infrastructure of PSET institutions must be explored. Lastly, as with all other PSET institutions, tracer studies post certification must be employed to ensure these qualifications add value.

The DHET recognizes that its existing education and training data systems (Higher Education Management Information System, HEMIS; Technical and Vocational Education and Training Management System, TVETMIS; SETA Education and Management Information System, SETMIS Higher Education Quality Committee Information System, HEQCIS; etc.) are highly duplicative and need to be overhauled and standardized. The overlapping responsibilities of coordination bodies or councils (the Council on Higher Education, CHE; QCTO; SETA; Umalusi; the South African Qualifications Authority, SAQA; the National Skills Authority, NSA) need to be addressed, particularly in respect of quality assurance functions. This may require amendment of the NQF Act.

The DHET seeks to support open education resources (OER), perhaps through a licensing framework through which learning materials funded by public money would be made available. The procurement and sharing of software licences to support and extend access to educational infrastructure should be nationally coordinated. There is also a need to re-evaluate and align the DBE's three-stream educational model with the structure of TVET qualifications overseen by the DHET.

To facilitate comprehensive tracer studies of students and their career progression, standardized records that include ID numbers have to be kept by PSET institutions. A CAS is proposed, together with systematic research on education and training results and employment outcomes.

Outcomes 1.3, 1.4, 2.1, 2.4: Inject clarity into the complex of PSET institutions. The DHET PSET Plan calls for a simplified NQF, with improved articulation for students between and within the NQF sub-frameworks and between and within institutions. This implies an integrated quality assurance and data system across quality councils.

The DHET plans to operationalize a CAS by 2025. This system is aimed at increasing and streamlining enrolment while improving the match between applicants and the PSET institutions best suited to enhancing their employment prospects. Implementing this system could necessitate radical transparency within the PSET sector, such as the CAS reporting the percentage of graduates who secure employment within a year of certification to the applicant during the application process. Achieving this requires harmonizing the CAS with the renewed and centralized information management system and a standardized learner post-certification tracer process.

Outcomes 2.7, 3.2, 3.3: PSET diversity and expansion and technology advances. Partnerships—for example, with local and international technology companies and science councils—are the key to preparing for and driving progress in the Fourth Industrial Revolution. The recruitment of expert teaching staff, optimal student–educator ratios, and continuous modernization of curricula are critical. Foundational maths and a diverse range of technology applications need to be supported, aligned to the country's growth and global positioning.

A responsive PSET planning system is needed, supported by research, as has been initiated in the DHET's Labour Market Intelligence project. Collaboration with centres of excellence in local and international universities and research institutions is vital and should also aim to turn South Africa's 'brain drain' into a 'brain gain'.

Systematic improvements are needed to TVET course offerings and academic staff capabilities, and so expansion has to be sequenced responsibly, beginning with fields such as nursing and agriculture in which teaching capacity can readily be sourced. Educational offerings can be gradually expanded to include advanced certifications as institutional capacities develop, meeting the evolving needs of both public and private sector employers. Once more, these offerings must be supported by evidence that the qualifications are demanded in the labour market.

To meet the evolving demands of the job market, a diverse range of programmes is essential, responsive to both evidence-based planning and research and direct engagement with employers. While public TVET and CET colleges form the backbone of South Africa's vocational education and training system, the country also boasts a wide array of private and independent training institutions closely linked to specific industries or professional bodies. Quality assurance councils play a crucial role in accrediting these institutions. However, greater focus on the labour market outcomes of the institutions could provide applicants with the necessary information to make informed decisions about where to seek certification. Expanded funding and opportunities for vocational education and training are needed across both public and private institutions.

Effective collaboration between the DHET and the Department of Science and Innovation and National Research Foundation is needed to identify and promote centres of excellence in research and innovation and to foster institutional differentiation and growth. A diverse range of mechanisms can contribute to improving research, innovation, commercialization, and entrepreneurship in higher education.

Outcome 4.1: Improved interface between education and training institutions and skills levy institutions. Responsiveness to labour market conditions is a key attribute of effective training and skills development systems. The DHET recognizes that this has several aspects, including:

- gathering and reporting on occupational skills needs (the Labour Market Intelligence project) to inform enrolment planning and curriculum development;
- active engagement between employers, labour, and government to ascertain future industry trends and skills needs;
- partnerships between educational institutions and industry to promote workplace-based learning (WPBL).

To improve systems coherence and efficiency, it is proposed that the quality assurance functions of SETAs and the National Artisan Moderation Body (NAMB) should be integrated into the QCTO.

A review and reconsideration is needed of the SDL and the roles and activities of SETAs, recognizing that there are substantial funding requirements that are not adequately met at present. These include TVET colleges, the emerging CET institutions, and the envisaged expanded role of the QTCO. A shared services system might contribute to more cost-effective and accountable functioning of the SETAs, for example in IT services and human resource management.

Moreover, as discussed above, the SDL institutions tax employment at R19 billion (2021/22) per year through a 1 per cent tax on every employee's salary while the employment tax incentive only remunerates employment by R6 billion per year. Finding other channels by which firms can recoup their SDL levy, such as through higher youth employment, might place greater pressure on SETAs and other SDL institutions to provide qualifications that are net value adding for the firms funding the qualifications.

The planning and budgeting cycles of skills development institutions should align with broader national planning and resource allocation processes. The current bifurcation between publicly funded colleges and skills-levy-funded private training programmes should evolve into a more integrated system. This seamless landscape would blend state resources and employer funding to optimize quality and responsiveness to labour demand, ensuring that expanding access does not compromise the quality of vocational education and training. Local and regional coordination between industry and TVET institutions is essential to reinforce economic development and investment promotion links.

Outcomes 2.6, 5.5, 6.1: Infrastructure investment, quality assurance and increasing throughput. Increased investment in infrastructure and institutional capacity is needed in the vocational education and training sector, to expand and improve teaching, learning, and research. Improved timetabling should be sought across all PSET institutions, together with repurposing under-utilized facilities and conversion of under-utilized government-owned buildings. Many of these investments can be funded through the rationalizations outlined above.

Improved quality assurance is a critical requirement if both employers and learners are to have confidence that appropriate education and training standards are being maintained. Alongside the evolution of the 'Occupations in High Demand' list developed by the Labour Market Intelligence project, ongoing engagement between employers and colleges is needed to strengthen qualification development and enhance stakeholder involvement in curriculum design, especially in key sectors.

To sustain economic growth and productivity advances, South Africa needs to achieve increased education and training throughput, together with sustained improvements in the quality and occupational relevance of curricula and training programmes. Research, data, and analysis are key inputs into improved planning, and active quality assurance interventions are critical elements in successful implementation of system improvements. The implementation of needed reforms must rest on improved collaboration and coordination between government authorities, science councils, centres of excellence in higher education institutions, and the institutional representatives of stakeholders in education and training, locally and nationally.

Conclusion

This report underscores the pivotal role of education in supporting economic growth and employment in South Africa and the need to invest in efficiency-enhancing improvements, particularly during periods of fiscal consolidation. Foundational literacy and numeracy are critical both to broad-based educational progress and to improving outcomes in higher education, vocational education, and training. A special focus is needed on expanding and improving opportunities for learners at the margin—those likely to gain access to higher education but at risk of failing to complete tertiary qualifications.

The importance of education for economic growth cannot be overstated. International research highlights that improvements in maths and science skills account for a significant portion of the variation between countries in GDP per capita growth. For South Africa, achieving education outcomes on a par with those of upper-middle-income peers would substantially increase GDP. Furthermore, university graduates face significantly lower unemployment rates and higher incomes than those with only a senior certificate. Increasing university enrolment and completion rates is crucial to fostering economic growth and employment.

Despite some improvements in the lower half of the learning distribution, weaknesses persist in the through-flow to further education and in completion rates. This report argues for a strategic focus on foundational literacy and numeracy as the key to progress throughout the education system. This is also a critical foundation for lifelong learning and skills development, adaptation to technological change, and building a productive, growing economy. South Africa's weak foundational skills present an opportunity for high long-term returns on investment in education reform.

The legacy of apartheid has included deep-seated barriers to inclusive economic growth, and the education system reflects this. While there have been notable gains in educational equality, these have not been sustained at the higher end of the learning distribution, which is crucial for generating future university graduates and taxpayers. The pandemic exacerbated the imbalance, causing substantial learning losses and increasing educational inequality. To ensure sustainable economic development, targeted education policies must focus on improving foundational literacy and numeracy, supported by efficient resource allocation and enhanced administrative efficiency. In vocational education and training, stronger alignment between learning programmes and work requirements must be sought.

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