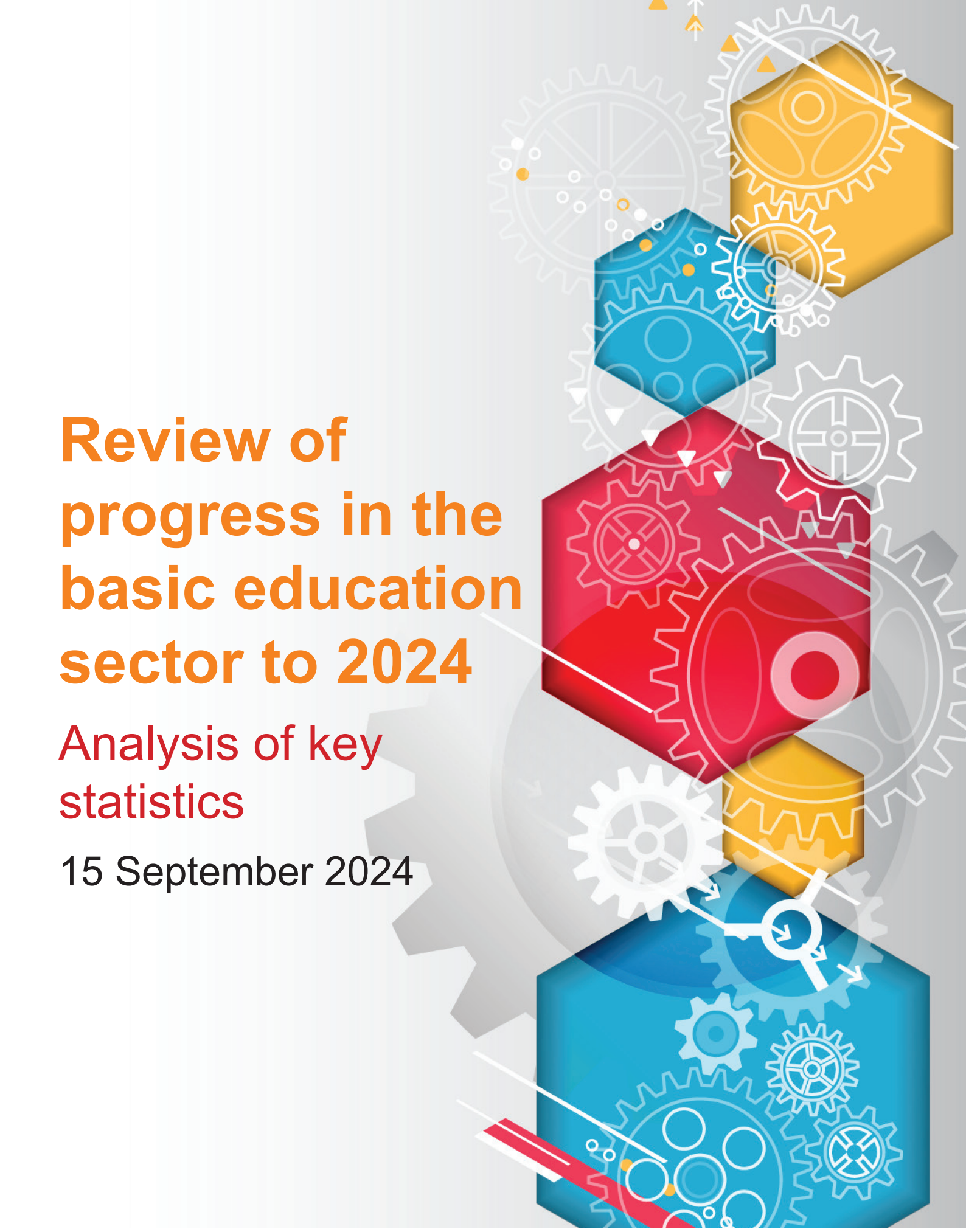
Review of progress in the basic education sector to 2024

Analysis of key statistics

15 September 2024



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DG FOREWORD

This review takes stock of key trends affecting and reflecting the delivery of basic education in recent years. Significant improvements in learning outcomes, according to the international assessments South Africa participates in, are a phenomenon the Department of Basic Education has been reporting on for over a decade. It is pleasing to note that increasingly analysts from beyond our country are taking note of this trend, and pointing to South Africa as one of a handful of exemplary improvers in the developing world. The current report provides fascinating details behind these trends. Rural parts of the country often out-perform urban areas. Where rationalisation of schools was most vigorously pursued, survival to Grade 12 improved fastest. South Africa achieves levels of participation at the secondary level which exceed those of almost all other developing countries. There seems to be a complex trade-off between providing large numbers of grades 10 to 12 learners with access to mathematics, as opposed to mathematical literacy, and producing enough Grade 12 matriculants with levels of mathematics achievement required by our universities.

The review brings together analyses which are currently informing the plans of the Seventh Administration. They have already been widely discussed with provincial departments, sister departments at the national level and key non-government stakeholders. Inputs obtained during these discussions have informed the interpretation of the data.

Importantly, the review reflects efforts over many years to improve the coverage and quality of data on our schools, and our capacity to analyse large datasets at the national, provincial and district levels.

I look forward to seeing this review being used as yet another tool contributing to continued improvements in the quality of basic education received by young South Africans.

HM Mweli
Director-General: Department of Basic Education

EXECUTIVE SUMMARY

Access to **quality schooling is vital for any country's development**. This is emphasised in the Sustainable Development Goals of the United Nations, the strategies of the African Union, and South Africa's own national policies. The current sector review draws from a range of data sources to examine trends relating to the demographics, participation levels, efficiency, learning outcomes and subject choices of the South African schooling system. Where relevant, the analysis extends back to the dawn of democracy in 1994. The aim of the review is to inform debates around past successes and challenges, and to facilitate planning for future progress.

The review examines in some depth what has been noted previously, by analysts in South Africa and beyond, namely that **South Africa's learners learn more and better now than they did 20 years ago**. But it also emphasises that despite improvement trends which are steep by global standards, **the schooling system still under-performs** relative to schooling systems in other middle income countries. If improvements of the kind seen over the two decades preceding the pandemic can be sustained, the country's indicators of learning outcomes could match those of successful middle income countries as early as 2030.

The pandemic had a clearly negative impact on the trajectory of quality improvements in South Africa. Yet **the evidence suggests the pandemic-related school disruptions and learning losses were similar to those experienced in the rest of the world** (section 5.1). The challenge of mitigating the harm of the pandemic is thus similar in South Africa to what it is elsewhere.

The review's analysis of learning outcomes draws from the results of the three international assessment programmes South Africa has participated in (section 5.1). These results provide essential information on where South Africa is heading, and the confidence the world can place in South Africa's trends. These results are behind the conclusion of the 2024 McKinsey report on education that **South Africa can be considered one of seven exemplary improvers of educational quality around the world**.

Though the Grade 12 national examinations are not designed to monitor national quality trends, careful analysis of these results can provide insights into South Africa's quality improvements (section 5.2). Grade 12 **youths who qualify for Bachelors studies at a university improved from 100 000 in 1994 to 280 000 in 2023**. Youths qualifying for any university-based programme in 2023 was as high as 470 000. Given that in recent years universities have only been admitting around 180 000 first-year students annually, these figures suggest that the schooling system has been performing well.

The challenge in terms of university-readiness now clearly lies in improving subject-specific marks in Grade 12. In particular, the **achievement of critical mark thresholds in the two subjects mathematics and physical sciences**, thresholds applicable to around two-thirds of first-year university students, needs to improve. These two subjects are strongly prioritised in government's five-year plan. Improvements have occurred, as should be expected given improvements over the years in Grade 9 mathematics, according to the international testing systems. To illustrate, the number of Grade 12 candidates in the public examinations obtaining at least 60% in mathematics increased from 32 000 to 41 000 between 2016 and 2023, and the evidence suggests this under-estimates the improvement due to increasing difficulty levels in the mathematics examination. Yet further improvements are necessary if a situation is to be avoided where universities admit students who have not met the formal admission requirements, in order to pursue enrolment targets in the university sector. Such a situation is clearly not ideal if the necessary engineering, scientific, financial and others skills needed by the economy are to be developed.

Section 2 deals with the size and composition of the school-age population. This has not been static, and has changed in unexpected ways, with far-reaching implications for the schooling system. If population trends are not taken into account, it is for instance possible to interpret a decline in the number of National Senior Certificate (NSC) passes as a failure of the system, when in fact this is due to a decline in the number of youths aged 18. Careful analysis of the various data sources point to **an ongoing increase in the school-age population between 2011 and 2028 totalling around**

20%. About half of this increase had already been realised by 2023. A key factor behind this increase is a 2003 to 2005 births surge, which has been moving through the grades of the schooling system. From around 2028, the school-age population is expected to level off, or even decline. Growth in the school-age population, despite earlier projections pointing to a decline, has contributed to less spending per learner and larger classes.

Demographic trends have differed markedly across provinces, the most noteworthy cases being **Gauteng's doubling of the school-age population between 1994 and 2024**, and a decline of around 20% in Eastern Cape over the same period.

Up to 2021 the basic education sector accounted for around 75% of all enrolments in education institutions for the population aged 0 to 29. In 2021 this figure increased to 93% with the official transfer of early childhood development (ECD) centres from the social development sector to the basic education sector. The **current review focusses on schools**, partly because policy changes in relation to ECD have resulted in several separate in-depth analyses of that sub-sector.

Levels of participation in schools are exceptionally high in South Africa (section 4.1). South Africa's participation levels of close to 100% for children up to age 15 are not exceptional, but what is exceptional is high participation beyond age 15. Participation in schooling for youths aged 20 and above, which can be considered over-aged enrolment, has been on the decline. But for youths aged 15 to 19 participation levels exceed what is seen in almost all other middle income countries. Schooling remains largely public, with only 5% of learners being enrolled in independent schools in 2023, though this was an even lower 2,5% in 1999.

Despite many opportunities for participation among youths beyond age 15, **the percentage of youths successfully completing twelve years of education in South Africa is on a par with that seen in economically similar countries** (section 4.5). This statistic has been improving, from 45% in 2008 to 62% in 2022. South Africa's combination of exceptionally high participation and average completion of twelve years of education reflects the fact that learning outcomes are still lower than they should be, which translates to considerable grade repetition and dropping out. Yet dropping out in South Africa is not exceptionally high in an international context. If anything, the situation is less critical in South Africa than elsewhere as youths who do drop out, do so at a relatively high age, given relatively good opportunities for participation.

The pandemic had the surprising effect of increasing the number of NSCs obtained in 2021 and beyond (section 4.5). This was largely due to the **unintended effect of changes to promotion rules below Grade 12**, which improved promotion rates and lowered repetition rates. However, the 2021 increase in the number of NSCs was also in part due to the fact that the earlier births surge began reaching age 18 in that year. Grade repetition decreased not just at the secondary level during the pandemic, but also at the primary level. The percentage of learners in ordinary schools, whether public or independent, repeating their grade declined from 12% in 2019 to 8% in 2021 (section 4.3).

The question of which factors contributed to learning improvements since around 2002 is not easy to answer with certainty. Three **factors which are likely to have contributed to the trends, and could also do so in future**, are dealt with in the current report: government spending, class sizes, and keeping learners in school as long as possible (or grade survival). Other sources, such as the reports of the Department of Basic Education's School Monitoring Survey, run in 2011, 2017 and 2022, should be consulted for a broader analysis of school-level factors influencing learning.

There is currently renewed interest in ensuring that **a strong focus on effective mother tongue teaching** facilitates learning, in particular at the primary level. Statistics on the language situation are provided in section 4.2, partly to inform current work on expanding the Mother Tongue-based Bilingual Education (MTbBE) approach.

Public spending per learner declined by 3% between 2017 and 2022, 2022 being the last year for which final audited financial figures were available. This undesirable trend is largely due to serious budget constraints in government, though the increasing demand for schooling associated with a rising school-age population has also played a role. The manifestations of the budget constraints include a substantial drop in infrastructure spending, and a decline in

the purchasing power of educators. Moreover, the learner-educator ratio has been lower in earlier years. While these patterns are clearly concerning, they should be viewed in a historical context. For instance, with effective planning it may be possible to prevent the LE ratio from reaching the peak seen in 2003. The purchasing power of educators saw substantial improvements in earlier years and current data suggest it is not likely to dip below the level seen in 2013.

The review provides new insights into to **class sizes** (section 4.4), made possible by better data collected from schools. The emphasis is on the primary level, where class sizes are easier to calculate, given the absence of subject choices, and where over-sized classes can have a particularly detrimental effect on learning. Around half of learners at the primary level in public schools in the last decade or so have been in classes exceeding 40, even though policy suggests 40 should be considered a ceiling. Moreover, around 15% of these learners have been in classes exceeding 55. Trends in recent years have been sensitive to shifting sizes of the birth cohorts in the population. Thus, in grades 1 to 3 the percentage of learners in classes exceeding 40 has declined between 2015 and 2023, while it has risen somewhat for learners in grades 4 to 7.

Grade survival has important effects on the opportunities youths enjoy (section 4.5). An over-emphasis on Grade 12 pass rates has detracted attention from the important and rather different matter of the extent to which learners in lower grades 'survive' to Grade 12 and succeed in obtaining the NSC. In fact, the three provinces with the highest NSC pass rates – Free State, Gauteng and Western Cape – are different from the three provinces with the highest Grade 12 survival rates, namely Limpopo, Mpumalanga and KwaZulu-Natal. Better survival rates can have surprising effects on the probability of achieving a high mathematics mark in the Grade 12 examinations. In particular, though Limpopo fares poorly on measures of learning at the primary level, it does well when it comes to ensuring that youths achieve a mark of at least 60% in mathematics. Perseverance, even if it involves grade repetition, appears to be important here. The review presents new analysis of this phenomenon, using learner-level data which allow inter-provincial movements to be taken into account. A striking pattern is that among black African and coloured learners, achievement of 60% in mathematics is more common in rural areas than urban areas. There are clearly opportunities to learn from successful rural schools and districts, while urban areas ought to look into why black learners do not fare better. Urban areas do emerge as more successful when all four population groups are counted, but this pattern is reversed when only black learners are considered.

Section 4.7 examines where learners go when they leave school. **Household data suggest around 60% of youths get to experience no education other than in a school**, and the data are clear that only 18% of youths obtain a post-school qualification. This underscores the immense importance of schools in equipping learners with skills for the difficult world of work. It is clear that more learners should move into post-school settings, and succeed in those settings. More education, and especially post-school education, is clearly associated with better employment prospects. Yet the patterns suggest that for many years the school will account for virtually all the education received for millions of youths. While obtaining the NSC from a school comes with better employment prospects than successfully completing only Grade 11, or less than this, the importance of the education of the latter group should not be under-estimated. Currently, around 32% of the employed among youths aged 15 to 35 have a Grade 11, or less than this, as their highest level of education. While these employed youths would be in occupations requiring relatively low skills, their opportunities would be sensitive to what occurred in grades 9, 10 and 11.

Subject choices made in Grade 10 are critical for individuals, but also influence how the schooling system as a whole produces skills needed in the country. Despite considerable public concern around the decline in the percentage of Grade 12 examination candidates taking mathematics, as opposed to mathematical literacy, the evidence suggests this phenomenon is often misunderstood. The percentage of candidates taking mathematics has indeed declined, from 49% in 2010 to 39% in 2023. However, with around half of mathematics candidates not passing mathematics, even at the 30% level, it is clear that many learners miscalculate their chances of passing. Provincial patterns, especially those of KwaZulu-Natal, point to **mathematics participation declining while the percentage of all candidates (not just mathematics candidates) obtaining high marks in mathematics has increased**. It is likely that having fewer struggling learners in the mathematics class has made it easier for teachers to focus on better performing learners. Future expansion in mathematics participation can occur, but this should be line with improvements in the mathematics

competencies of learners in the grades below Grade 10.

Increasing participation in practical subjects at the secondary level has been a priority in the sector for many years, the aim being to equip youths with a wider range of skills for which there is a demand in the labour market. **Grade 12 trends point to practical subjects, in the sense of subjects with a practical assessment task (PAT), being taken by many more learners**. Much of the trend is driven by three subjects: tourism, consumer studies and hospitality studies. While this is positive, participation in smaller technical subjects offering skills in short supply, particularly the computing and engineering subjects, needs to be more vigorously promoted.

Contents

Tables and figures

1. INTRODUCTION

Providing relevant and quality basic education to all young people is a high-priority global, continental and national goal. Globally, the migration after 2015 from the Millenium Development Goals to the Sustainable Development Goals came with an important shift of emphasis towards how effectively children learn in schools, as opposed to just participation in schooling. A 2014 UNESCO report provides an important outline of the evidence supporting the idea that education of a sufficient quality is a major contributor to poverty reduction, a healthier population, economic growth, greater equity, environmental sustainability, and peace between nations. Quality education is a 'basis for progress in every country'[1].

At the continental level, the African Union's *Continental Education Strategy for Africa 2016-2025* (CESA) recognises the importance of focussing on both access to schooling, and improving learning outcomes[2]. It also underlines the importance of some specialisation at the secondary level to support specific industrial and economic needs in the country.

Information on access to schooling and the quality of this is vital. Information is needed for proper debates around how strategies and external factors, such as population trends, have influenced educational progress in recent years. But information also facilitates planning through more accurate projections of what the likely and possible future scenarios are. South Africa is relatively well-endowed with information and data. Among developing countries, the South Africa is a particularly active participant in the international learner assessment programmes[3]. Public spending data is of a high quality, which facilitates tracking the equity of resourcing in the schooling system – South Africa has for many years received good ratings in the Open Budget Survey, especially as far as the transparency of spending statistics is concerned[4]. Partnerships such as that between the Department of Basic Education (DBE) and DataFirst at the University of Cape Town[5] facilitate work by a wide range of researchers on education issues. During the pandemic, South Africa was among the first developing countries to make information on the impacts of the pandemic publicly available[6].

Much of this review focusses on two indisputable facts about schooling in South Africa. Firstly, while access to schooling is exceptionally high in an international context, the quality of schooling in the country remains below that of middle income country peers. Secondly, for around two decades after around 2000 there were relatively steep improvements in the quality of schooling, according to reliable international assessment programmes. In other words, while there have been impressive improvements, further improvements are necessary and, judging by past achievements, possible.

The education indicators put forward in government's 2019 to 2024 development plan, the Medium Term Strategic Framework[7], shape the specific areas of emphasis of the review. Moreover, the review updates several elements from the background analysis presented in the DBE's five-year education sector review, *Action Plan to 2024*[8].

This review focusses largely on measurable past trends. The main body of the report focusses particularly on national trends, with references to provinces, and in some cases districts, appearing where this was particularly relevant. A comprehensive set of graphs disaggregating all key statistics by province appears in an appendix. The period covered depends in part on the availability of data, and in part on the issue in question. Population and educational quality trends require a longer-range analysis given that shifts occur gradually. The review's analysis of spending, on the other hand, focusses largely on trends since 2017 given the very serious budget constraints that have emerged since then and which require special attention.

1 UNESCO, 2014.
2 African Union, 2016: 15-17.
3 UNESCO Institute for Statistics, 2018: 36.37.
4 internationalbudget.org.
5 www.datafirst.uct.ac.za.
6 Moscoviz and Evans, 2022.
7 Department of Planning, Monitoring and Evaluation, 2021.
8 Department of Basic Education, 2020a.

The review should be read in combination with other reviews on trends in South Africa's education system which follow a somewhat different approach. Of great importance are the reports emerging from the DBE's School Monitoring Survey, run in 2011, 2017 and 2022. This survey, involving a representative sample of around 2 000 schools, gathers information relating to key indicators, especially where this information is not easily available from alternative sources.

It is noteworthy that a 2024 McKinsey report on educational quality around the world pointed to South Africa as an exemplary improver, drawing from data also used in the current review[9].

While there is some emphasis in the current review on early childhood development (ECD) centres outside schools, the review focusses mainly on schools. The budgets for ECD centres were transferred to the basic education departments in 2023, after several years of planning for this move, and have been the subject of several recent reports[10].

The report draws from many data sources. Key sources, and the last point for each source available when this report was prepared are the following:

- International test data available up to mid-2024. This means that TIMSS[11] 2023 data are not considered.
- National Senior Certificate (NSC) examinations data up to 2023.
- EMIS[12] enrolment data up to 2023.
- National Treasury's consolidated Estimates of Provincial Revenue and Expenditure (EPRE) statistics up to the 2024 release of the relevant Excel tool.
- Persal payroll data for the nine provincial education departments up to November 2023.

For analyses of critical importance to the report, analyses were taken to the last point permitted by the data source. However, where the most recent trends were likely to be of lesser interest, analyses were brought in to the report even if they were not updated. Lastly, the important 2022 Systemic Evaluation data of the Department of Basic Education were not analysed – at the time when the current review was being produced, the Systemic Evaluation report and data were not yet available.

2. DEMOGRAPHIC TRENDS

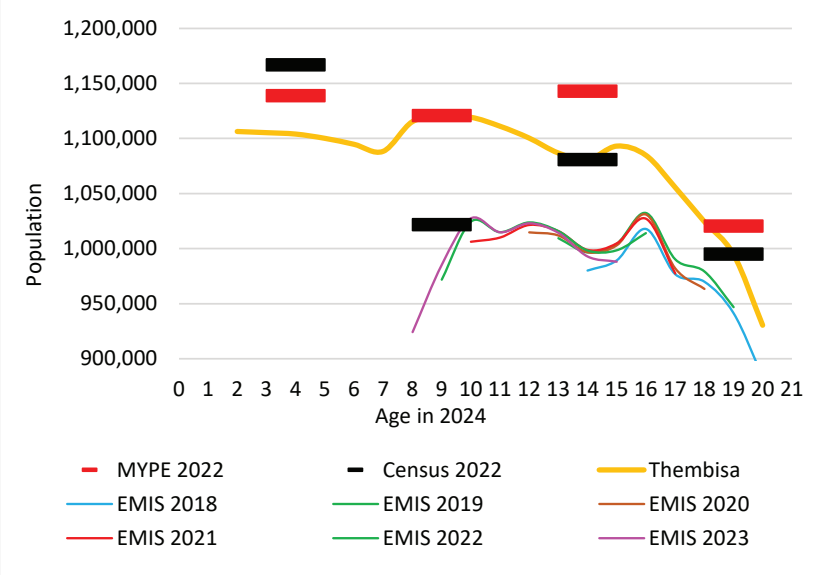
The demographic factors that affect the demand for schooling have been complex for two reasons. Firstly, school-age population estimates based on data collected from schools consistently point to lower values than population estimates produced by demographers. It appears very likely that the latter are over-estimates. Secondly, expectations around future school-age population figures have shifted radically: around ten years ago it was predicted that numbers of school-age children would decline substantially, yet some years later it became clear that numbers were increasing. Current estimates point to a continuous 20% increase in the school-age population between 2011 to around 2028, after which numbers plateau. The enrolment figures suggest around half of this increase, or around 10%, had already been realised by 2023. The sizes of the demographic shifts can be considered large, and would explain many of the resourcing pressures experienced by the schooling sector.

Much of the discussion of participation and attainment in this review uses population statistics as a point of reference. Figure 1 illustrates a phenomenon that is common in developing countries[13], namely noteworthy disparities between population numbers suggested by school enrolment data, and official population numbers. Household data indicate that essentially all children in the age range 7 to 14 are in school[14], and schools and provinces have a strong incentive to ensure that no learners are left uncounted in the annual reporting processes, as learner numbers drive the funding of provinces and individual schools. The EMIS[15] curves in Figure 1 for 2018 to 2023 each draw from learners aged 7

9 McKinsey & Company, 2024.
10 See for instance World Bank, 2022.
11 Trends in International Mathematics and Science Study.
12 Education Management Information System.
13 Stukel and Feroz-Zada, 2010.
14 Department of Basic Education, 2023a: 8. Here it is explained that according to the General Household Survey,
15 Education Management Information System.

to 14, and would be shifted horizontally to reflect the age in 2024. They can be considered accurate and essentially 'census-based' values. These curves point to there being just over a million people per birth year aged around 10 to 17 in 2024, and never more than 1 050 000. Statistics South Africa estimates, on the other hand, point to considerably higher population numbers, for instance around 7% higher for ages 12 to 16 in 2024, using Census 2022 findings published in 2023. The gap between the two sources for around age nine is much smaller. Stats SA's Mid-Year Population Estimates (MYPE) for 2022, published in 2022, produce an even larger gap between official population numbers and what the EMIS data suggest. It is important to take these discrepancies into account when, for instance, calculating statistics such as the percentage of the population obtaining the National Senior Certificate (NSC).

Figure 1: Population estimates by single age in 2024



Sources: Official 2022 MYPE publication; Statistics South Africa (2023: 9); Thembisa 4.6 2022 estimates available at www.thembisa.org; analysis of learner-level data described in Department of Basic Education (2023b).

Note: MYPE and Census 2022 bars represent five-year age bins (beginning with age 0 to 4) divided by 5. However, because ages in 2024 are used in the graph, age 0 to 4 in 2022 becomes 2 to 6 in 2024, and so on. Similarly, EMIS totals were shifted to correspond to the age that learners would turn in 2024.

Population estimates from the Thembisa Project, also illustrated in Figure 1, are closer to Stats SA estimates than to EMIS-based estimates, which is to be expected given that Thembisa uses sources and methods similar to those of Stats SA.

The striking decline between age 10 and 8 and between age 16 and 20 in the EMIS curves is roughly compatible with the Census pattern, which points to considerably more people in the 12 to 16 age range than in either the earlier 7 to 11 range or the later 17 to 21 range.

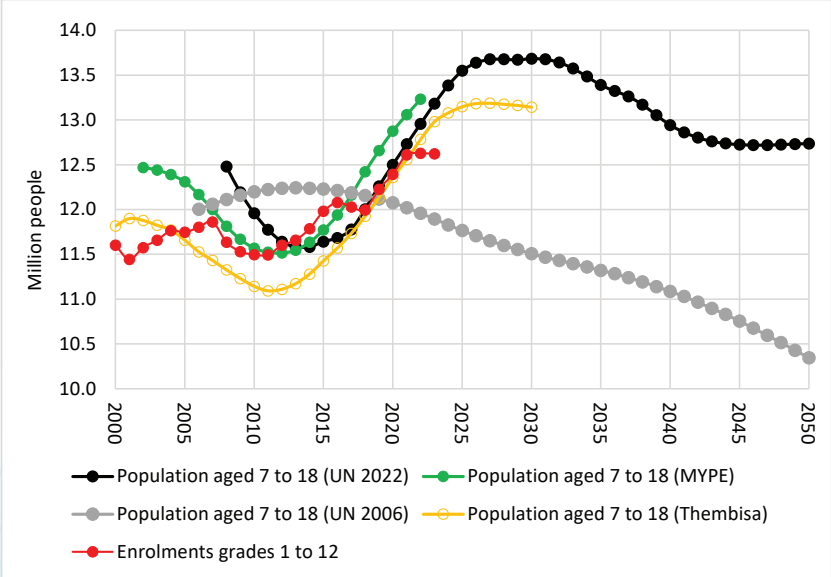
Appendix A breaks down the disparities by province. MYPE and Thembisa are each compared to EMIS – at the time of the current analysis age-specific breakdowns by province for Census 2022 were not available. The discrepancies vary across provinces, with North West's school-age population estimates being 20% higher for non-EMIS sources compared to EMIS, and Limpopo's figures being only around 2%, meaning the discrepancies are small. These inter-provincial differences have implications for the funding system, as explained in section 3.

There are two widely used sets of future population projections for South Africa. The one is the World Population Prospects of the United Nations, the other the Thembisa dataset, compiled by a team of South African demographers[16]. Thembisa projections go as far as 2030, and are broken down by single age and province. The UN projections stretch to 2100, but are broken down only by five-year age categories. Figure 2 illustrates the trends published by the two

16 Johnson and Dorrington, 2023.

sources. In the case of the UN projections, both the 2006 and 2022 World Population Prospects figures are illustrated to indicate how extensively expectations relating to the school-age population[17] changed for South Africa. Around ten years ago there was still an expectation that the school-age population was about to enter a period of decline. Pressures in relation to rising enrolments in South Africa currently are largely due to an unexpected and steep rise in the school-age population, linked in to an initially undetected surge in births between 2003 and 2005[18]. This surge explains the large difference between age 20 and around age 18 seen in the EMIS-based estimates in Figure 1.

Figure 2: Projections of the school-age population



Sources: UN future estimates are the 'medium variant' in the World Population Prospects series – 2006 and 2022 used (https://population.un.org/wpp). Sprague algorithms were used to convert five-year age groups to single ages. Stats SA values are historical values included in the MYPE 2022 package. See Figure 1 for Thembisa. Grades 1 to 12 enrolments are from official public ordinary school publications and include independent schools.

Historical MYPE and enrolment figures in Figure 2 both point to sharply rising numbers of school-age children and youths since around 2011. The flattening of the trend with respect to enrolments seen in 2022 and 2023 is likely to be mostly attributable to declines in grade repetition during the pandemic discussed in section 4.3 below. In short, Figure 2 points to the school-age population increasing by around 20% in the period from around 2011 to around 2028, after which numbers plateau. The enrolment figures suggest around half of this increase, or around 10%, had already been realised by 2023. Put differently, the remaining half of the increase lies in the future.

There is insufficient certainty around what is in the 'population pipeline' of recently born children about to enter schooling. Census 2022 estimates illustrated in Figure 1 point to substantial increases in this pipeline: children aged 0 to 4 was 14% higher than children aged 5 to 9 in 2022. The Thembisa figures, on the other hand, do not point to a substantive increase in the sizes of age cohorts about to enter school.

It is important to consider the distribution of the school-age population across the two categories ages 7 to 13 and 14 to 18, as these sub-ranges correspond to primary and secondary schooling[19]. Changes in the distribution of demand for schooling are in theory dealt with by the enrolment-based formulas of the post provisioning norms and the school

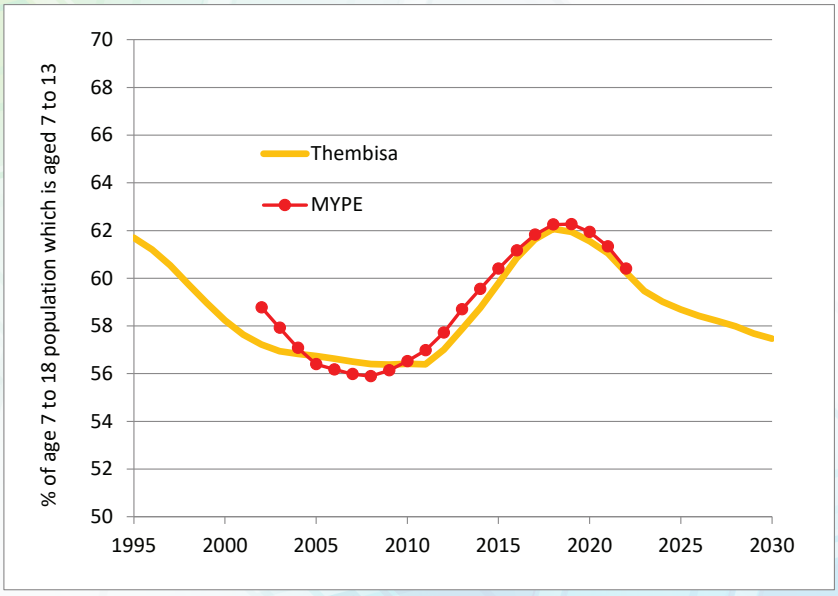
17 Ages 7 to 18 are used here, which correspond to grades 1 to 12. This range is particularly important as historically it is grades 1 to 12 which had to be resourced with university-trained teachers, who carry relatively high costs. The gradual alignment of Grade R with the higher grades in terms of, for instance, resourcing, will make the age range 6 to 18 increasingly important. It should be noted that expanding the age range by a year makes very little difference the general patterns and hence, for instance, each province's share of the total. See Figure 40 in Appendix A.

18 Gustafsson, 2018; Schmidt, 2017.

19 Van der Berg *et al*, 2021: 9.

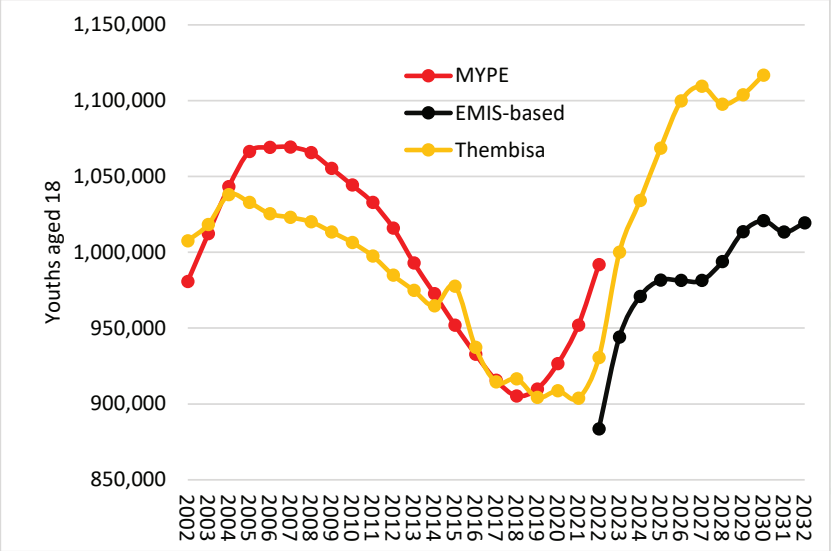
funding norms, but such changes may bring about unintended challenges, such as infrastructure pressures. As seen in Figure 3 below, the percentage of the age 7 to 18 population which is aged 7 to 13 has fluctuated between 56% and 62% over the years. After a decade of an increase in the statistic, which would have added a layer to the demographic pressures experienced by primary schools, there is currently a decline in the comparative size of the primary-aged population, which provides some relief at the primary level. The upturn in 2010 essentially corresponds to the entry of the earlier births surge into Grade 1 while the downturn some years later roughly corresponds to the movement of the demographic incline from the primary to the secondary level. As shown in Appendix A, the patterns are similar across provinces.

Figure 3: Percentage of the school-age population that is primary-aged



Of special interest in the education sector is the number of youths aged 18, and future trends in this regard. These trends are one important determinant of the number of full-time Grade 12 learners obtaining the National Senior Certificate (NSC). As can be seen from Figure 4, demographics would have exerted mostly downward pressure on the number of NSCs over the period 2002 to around 2018. Thereafter, demographics would have assisted in increasing the number of NSCs. Roughly, the three data sources used for the graph are in agreement with regard to trends, though it is noteworthy that future increases in the number 18-year-olds are much smaller using the relatively reliable EMIS-based source than the Thembisa projections.

Figure 4: Population aged 18 per year



Note: EMIS-based projections into the future use the assumption that, for instance, youths turning 18 in 2028 would have turned 13 in 2023, 12 in 2022, and so on. Only children turning 7 to 14 in each school year were considered in these calculations. Where there was more than one year of data, for instance aged 8 in 2022 and 9 in 2023, the average across the years was calculated.

There are major and ongoing population shifts across provinces. Table 1 provides the mean annual values for all inter-provincial movements seen in the EMIS data, for all school grades, including Grade R, from 2018 to 2023. To illustrate, the largest inter-provincial migration figure has been for learners moving from Limpopo to Gauteng. The 16 848 value here is the average across five transitions: 2018 to 2019; 2019 to 2020; 2020 to 2021; 2021 to 2022; and 2022 to 2023.

Table 1: Mean annual inter-provincial migration figures 2018 to 2023

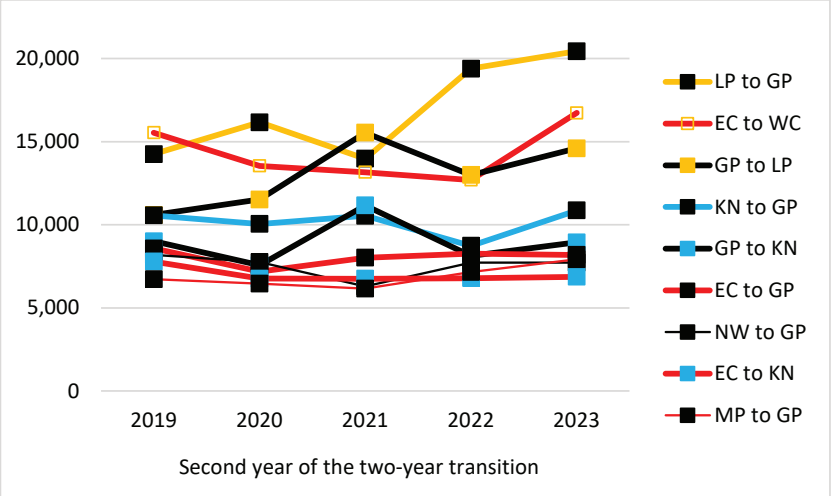
	EC	FS	GP	KN	LP	MP	NC	NW	WC
% from outside	1.3	1.3	2.5	0.8	1.2	1.7	1.7	1.7	1.7
EC	1,621,658	1,314	8,044	6,993	385	770	345	1,431	14,334
FS	956	646,487	4,278	752	330	562	604	1,218	382
GP	5,897	3,871	2,199,302	8,965	13,050	6,713	750	6,698	2,300
KN	4,841	837	10,151	2,554,188	559	2,847	116	407	689
LP	301	308	16,848	505	1,591,940	4,780	125	1,699	196
MP	577	496	6,883	2,261	3,343	981,073	123	574	236
NC	306	603	773	128	117	110	270,618	1,513	841
NW	954	1,103	7,538	453	1,592	602	1,721	772,540	278
WC	6,744	267	1,310	407	100	156	774	173	1,100,086

Note: Row headings indicate the province of origin, column headings the destination province, for learners present in two consecutive years. The '% from outside' values are calculated from the other values in the same column and indicate learners coming from outside the province as a percentage of all learners counted in the column.

Figure 5 below analyses the trends over time of the nine largest migrations, in part because earlier analysis pointed to the pandemic disrupting typical migration flows[20]. Specifically, the graph demonstrates that between 2020 and 2021, the first transition during the pandemic, the flow from Gauteng to Limpopo exceeded the flow from Limpopo to Gauteng, confirming anecdotal evidence that many people left Gauteng during the crisis. However, by the following transition, of 2021 to 2022, the regular pattern of a net positive flow towards Gauteng had resumed.

20 Department of Basic Education, 2023b.

Figure 5: Trends in key inter-provincial migrations



3. FINANCING THE BASIC EDUCATION SECTOR

Budget pressures arising in recent years, while posing serious challenges for the basic education sector, should be viewed in the broader historical context. The challenges are not all new. While per learner spending has declined by 3,0% in real terms between 2017 and 2022, spending per learner in 2016 was 130% higher in real terms than what was seen in the early 1990s, in the final apartheid years. Per learner current spending in South Africa remains the highest in Sub-Saharan continental Africa, is about on a par with that in Brazil, and over twice the level seen in India, all in purchasing power terms. While there is a risk that the learner-educator ratio will worsen in the years leading to 2030, due to a combination of budget constraints that limit hiring and a growing school-age population, with careful planning it is possible that the ratio will not exceed what was seen during its last peak, in 2003.

In terms of economic categories, worst affected has been capital investments in school infrastructure, which are expected to be 30% lower in 2025 in real terms, compared to 2017. Non-capital non-personnel spending, which is easily crowded out by personnel spending, yet is vital for the proper functioning of schools, has been well protected, and is expected to grow at least in line with inflation. However, the real value of the school allocation, which represents funds flowing directly to schools, is expected to decline by 4,0% in real terms between 2017 and 2025, according to official targets. This is concerning and raises important questions around how budget lines within NPNC are prioritised.

While personnel spending trends point to further declines in the purchasing power of educators, this purchasing power is not expected to be worse in the coming years than it was in 2013, given pre-2017 improvements.

The evidence suggests South Africa's public education expenditure continues to be relatively equitably distributed, both across provinces and within provinces. However, there are legitimate concerns around whether the formula distributing funding to provinces could go further to advance across-province spending equity.

Table 2 below provides statistics on the financing of the basic education sector, for the period 2017 (or 2017/18) to 2025 (or 2025/26). The starting point of 2017 permits six years of historical values which are final audited figures, meaning up to 2022. This explains why much of the focus on trends is from 2017 to 2022. Clearly, pre-audited or expected expenditure figures, shown in grey, could change. The table reflects the situation across the nine provincial education departments, which account for almost all of the sector. The spending of the national Department of Basic Education (DBE) comes to just 2% of provincial education spending, after transfers to provinces have been subtracted[21], to avoid double-counting. Just under half of the DBE's 2% goes to two items: learner and teacher support materials directed at schools in provinces; and Funza Lushaka bursaries for prospective teachers.

The increasing burden for government of debt repayments has made it important to gauge education spending relative to both the economy, or gross domestic product (GDP), as is typically done, and relative to government's non-interest

21 These transfers account for around 8% of provincial revenue.

spending. What stands out in the table is that basic education spending relative to what government has to spend on investments and services, in other words non-interest spending, has declined from 18,1% in 2017 to 17,3% in 2022. The reason why basic education spending over GDP displays a slight upward trend over this period is that non-interest spending over the economy as a whole has grown, in large part because of the emergency of the COVID-19 pandemic. Education's share of non-interest spending is expected to be slightly higher in 2024 to 2025, relative to 2017 to 2022. This in part reflects the fact that provincial education departments have taken on the additional responsibility, from the departments of social development, of subsidising early childhood development (ECD) centres. Further details regarding this are discussed below.

In line with common practice in the sector, three categories of spending are identified in the table: compensation of employees; payments for capital assets (or infrastructure spending); and everything else under the label 'non-personnel non-capital', or NPNC. Furthermore, in education it is important to separate educators from other employees within the compensation of employees category.

The sharp decline in infrastructure spending is the most striking result of the budget pressures being experienced in the sector. This spending is expected to decline in real terms by 30% between 2017 and 2025, with most of this decline already realised by 2021. Up to 2016, there had been a more or less continuous real increase in infrastructure spending for more than a decade. The post-2016 decline reflects the fact that infrastructure spending is easier to cut, without causing immediate service delivery problems, though the longer-term effects are serious. Though the 30% 2017 to 2025 decline is serious, the decline for all of government infrastructure spending is worse, at 44%[22].

Compensation of employees is expected to be 1,0% below the 2017 level in 2025, in real terms. This is in line with government's strong emphasis on reversing some of the large real increases in public wage spending seen over the last 15 or so years. Spending on compensation of employees for all of national and provincial government declines by 15% in real terms between 2017 and 2025, making basic education's 4,4% decline relatively low. Despite the expected overall decline up to 2025, the 2022 level of spending equals that of 2017 in real terms. This constancy of real spending has been accompanied by limited growth in the publicly employed educator workforce of 2,3% between 2017 and 2022, and 4% between 2017 and 2022, due to real declines in the average cost of an educator, as discussed below.

The sharp real decline in the average annual basic salary, excluding benefits, of educators seen across 2017 to 2022 reflects in part the 2021 agreement to move, on a temporary basis, a portion of educator earnings to a non-pensionable cash allowance, which is outside the basic salary. This agreement expired in 2023, and a new agreement will revert to the traditional emphasis on the basic salary, putting the expected average basic salary in 2024 5,5% below the 2017 level in real terms. This decline should be seen against the background of an 8% rise in the average purchasing power of educators seen in the earlier 2013 to 2017 period[23]. The general pattern has been that public sector wage growth exceeded that in the private sector up to around 2018[24], after which cutbacks in public wages resulted in better wage improvements in the private sector[25].

In short, publicly paid educators are still better off in 2024 than they were in 2013. The compensation of employees line in Table 2 suggests it will be possible to maintain at least 2013 real income levels up to 2025, while also allowing for some growth in the workforce. One mitigating factor is that the retirement of a bulge of older educators is resulting in a decline in the average age of educators, which in turn exerts downward pressure on wages, given that younger educators are placed lower on the system of salary notches. However, this effect is not large enough to provide significant relief to the budgetary situation[26].

It is important to distinguish between year-on-year trends in the average salary of educators, and the year-on-year

22 From *Budget Review 2024*.
23 Department of Basic Education, 2020b: 18.
24 National Treasury, 2019: 58.
25 Sachs *et al*, 2023: 6.
26 Gustafsson (2023) indicates that the age-related dividend essentially offsets the annual notch progression of 1,5% for all educators. Put differently, the demographic shifts permit educators to continue to receive the 1,5% increase in purchasing power, while the average cost of an educator remains constant in real terms.

increases experienced by individual educators. In a context of a declining average age, the former appears worse than the latter. The former could display no improvement while the latter does display improvements. If many older, and better paid, educators are leaving, and being replaced by younger and less paid educators, the funds thereby released could contribute to better year-on-year increases experienced by educators, or more workforce growth. A crucial factor is the experience-linked 'annual notch progression' applicable to virtually all educators, separately from inflation-linked increases. This experience-linked increase changed from 1,0% to 1,5% a year after 2018[27].

An important and worrying trend has been reductions in the number of better paid educators with management responsibilities. Budget pressures within the compensation of employees line have prompted provinces to leave vacated management positions, particularly those of schools-based heads of department and deputy principals, unfilled. The percentage of educators who are level 1 teachers has continued to rise during 2017 to 2023, from 77,5% to 78,5%, after a steep rise in the pre-2017 years. This figure was 75,4% in 2012[28]. As seen in Appendix A, effects in this regard are particularly large in certain provinces, such as Limpopo.

Of the three economic categories, the non-personnel non-capital (NPNC) category experiences the least adverse effects over the 2017 to 2025 period. This reflects government's commitment to ensuring that personnel spending does not unduly crowd out non-personnel current spending, leaving educators without the tools to perform their duties. This commitment partly reflects a desire to avoid the serious under-spending on NPNC experienced in the late 1990s and even early 2000s: in the 2003 to 2006 period, within the public ordinary schools (POS) budget programme, NPNC as a percentage of personnel spending was 12%, against 18% in 2022[29].

But the large increases in NPNC for provincial education as a whole in recent years also reflect the introduction of two new financial responsibilities during the period: the Presidential Youth Employment Initiative (PYEI), with budgets extending to 2023/24; and the permanent transfer of the funding of ECD centres to the basic education sector. The early childhood development budget programme across the nine provinces sees spending rise from R6,9bn in 2019 to R11,2bn in 2025, shifting this programme as a percentage of all provincial education spending from 2,7% to 3,4%.

NPNC spending within the public ordinary schooling budget programme does not flow to the new responsibilities to any significant degree. Even with a 1,6% growth in public ordinary school enrolments, from grades R to 12, between 2017 and 2022, per learner NPNC funding was able to increase by 8% in real terms[30]. However, growth in the per learner school allocation, which accounts for just under half of NPNC spending on public ordinary schools, has been slow and the allocation is expected to be worth 3.8% less in real terms in 2025 compared to 2017[31]. This is concerning, as although the school allocation accounts for only 7% of spending on public ordinary schools, it is a strategically important funding source that facilitates the purchasing of educational and non-educational materials schools need to function. It is moreover a funding source that has grown in the past as a result of its importance: the average official school allocation amount in 2023 is 6% higher than the value for 2011 in real terms, largely because quintiles 2 and 3 targets were raised to match the higher quintile 1 target in 2013. The quintile 3 real improvement in the value of the school allocation as a result of this process was particularly large, at 29%.

NPNC spending on public ordinary schools outside the school allocation is mostly non-transfer spending, which includes spending on educational materials procured directly by the provincial department. Moreover, a quarter of NPNC in this programme is accounted for by the National School Nutrition Programme (NSNP). The abovementioned 8% real increase in per learner spending between 2017 and 2022 is fairly evenly spread across provinces, sub-programmes and economic categories.

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27 Public Service Co-ordinating Bargaining Council (PSCBC) Resolution 1 of 2018.
28 Department of Basic Education, 2017a: 21.
29 Department of Education, 2006: 68.
30 In this section, special school enrolments, which account for around 0,9% of all school enrolments, are not taken into account, due to uncertainties around the special school statistics. This is very unlikely to influence the trends reported here, though to a very small extent certain per learner spending statistics would be affected. Public special schools fall under a different budget programme to POS.
31 Values in the line 'Average value of school allocation target' are the averages across the five published quintile amounts.

Turning to overall spending per learner, defined here as total provincial education spending divided by all enrolments in public and independent ordinary schools, this declines in real terms by 0,3% between 2017 and 2022 if the increase in ECD spending and spending on the PYEI are included, and declines by 3,0% if they are excluded. This decline is concerning. Yet South Africa's public spending per learner is not low, in purchasing parity terms, in the global context. It remains the highest reported value for continental Sub-Saharan Africa, is approximately on a par with Brazil, and over double what is seen in India[32]. In the historical context of South Africa, present spending levels remain good. Per learner non-capital spending was around 2,3 times higher in real terms in 2016, compared to 1991, and 3,8 times higher if only black African learners are considered[33]. In practical terms, the implications of this includes smaller class sizes, better access to materials among learners, and learners who are better nourished.

Table 2: Key basic education financing indicators 2017 to 2025

	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total provincial education spending (Rm)	225,235	241,166	257,837	266,048	280,907	293,822	311,925	316,462	328,824
Index of above in real terms	100.0	102.3	105.1	105.0	106.0	103.8	104.0	100.6	99.9
Total provincial education spending over GDP	4.4	4.4	4.5	4.7	4.5	4.4	4.4	4.2	4.2
Above over non-interest spending (%)	18.1	18.2	17.3	17.1	17.3	17.3	18.5	18.0	17.9
Compensation of employees	177,444	189,501	202,812	205,363	215,308	223,036	235,658	244,834	256,631
Index of above in real terms	100.0	102.0	104.9	102.8	103.2	100.0	99.7	98.8	99.0
% of compensation of employees to non-educators	89.5	89.7	89.6	89.1	88.6	89.5	89.6		
Payments for capital assets	10,488	9,639	9,500	6,873	9,030	10,014	10,056	11,319	10,662
Index of above in real terms	100.0	87.8	83.2	58.2	73.2	76.0	72.0	77.3	69.6
Non-capital non-personnel (NPNC)	37,303	42,026	45,525	53,812	56,569	60,773	66,211	60,309	61,531
Index of above in real terms	100.0	107.6	112.0	128.2	128.9	129.6	133.3	115.7	112.9
NPNC over all current (%)	17.4	18.2	18.3	20.8	20.8	21.4	21.9	19.8	19.3
Basic education function over non-interest spending		16.9	16.1	15.9	16.2	16.2	17.2	17.1	17.0
All education over non-interest spending		19.6	19.1	18.8	19.7	20.0	21.6	21.1	20.9
Publicly paid educator count in Nov.	391,735	391,555	396,008	401,327	400,892	400,551	407,349		
Level 1 teachers as % of above	77.5	77.0	77.3	78.0	78.6	78.0	78.5		
Average basic salary of an educator in Nov. (R)	303,149	323,753	343,388	343,068	343,602	351,596	382,110	400,069	
Index of above in real terms	100.0	102.0	104.0	100.6	96.4	92.3	94.6	94.5	
Learner-educator ratio	29.8	29.2	29.4	29.3	29.8	29.8	29.3		
Average value of school allocation target	913	965	1,022	1,071	1,077	1,129	1,177	1,229	1,284
Index of above in real terms	100.0	100.9	102.7	104.2	100.3	98.3	96.8	96.3	96.2
NPNC in POS per learner	1,982	2,229	2,358	2,491	2,537	2,686	2,927	2,859	2,975
Index of above in real terms	100.0	107.4	109.2	111.7	108.8	107.8	110.9	103.2	102.7
% of enrolment in independent schools	3.1	4.6	4.9	5.1	5.2	5.5	5.7		
% of current spent on independent schooling	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Note: In the case of official financial figures, to illustrate 2017 would refer to the April 2017 to March 2018 2017/18 financial year. Values in grey are financial values which are not final audited outcomes. Where enrolments are the denominator, 2023 enrolments apply for 2024 onwards (official 2024 enrolment statistics were not finalised at the time of writing).
Sources: Source for financial values is Treasury's EPRE Excel files, available on the National Treasury website, going up to the 2024 file published in 2024. Moreover, the national Budget Review up to 2024 is used. The learner-educator ratio is grades 1 to 12 enrolment in public ordinary schools divided by full-time permanent and temporary educators, whether based in schools or not, in Persal in November. Average salary values use November Persal payroll data (see also note to Figure 49), though the 2024 value is based on the 4.7% increase agreed on for that year. Details relating to enrolments are from official School Realities reports. The 2017 value for '% of enrolment in independent schools' of 4.5% is the average of the 2016 and 2018 values given that there were clearly independent school learners incorrectly classified as public school learners, specifically in Gauteng, in the official 2017 statistics.

A key reason why ratios such as per learner spending and the learner-educator ratio are worsening is that the school-age population has experienced large, and to some extent unexpected, increases, as described in section 2. Some relief in terms of public provisioning has been brought about by an increase in the percentage of learners enrolled in independent schools. Between 2017 and 2022, 1,0% of overall enrolments moved from the public to independent sectors. This trend has been accelerating: between 1999 and 2017 independent school enrolments over all enrolments increased at a slower rate, moving from 2,5% to 4,5%.

32 UNESCO, 2023: 351.
33 Buckland and Fielden (1994: 17) and Department of Basic Education (2018a: 18).

However, the predominant factors with respect to the demand for public schooling services have been, firstly, population pressures and, secondly, improved participation rates, linked to higher survival rates to Grade 12. Establishing reliable population trends can be difficult, in part because of the high reliance on modelling between census years. However, various sources point to a peak in the population aged 7 to 18 of around 12 million in 2001, followed by a dip, before a steep and continuous incline beginning in around 2011, taking the school-age population to 13,5 million around 2028, after which a slow decline sets in (see section 2). The post-2011 incline has come with serious service delivery challenges, including rising class sizes. Over the years 2017 to 2022 enrolments in public and independent schools increased by 4%, while real overall spending increased by just 1,0%, after new responsibilities are deducted. One mitigating factor is declines in grade repetition, which results in lower enrolments in the longer term. Repetition patterns declined significantly during the pandemic. For instance, in Grade 10, a grade with historically the highest levels of repetition, the percentage of learners repeating the grade dropped from 20% in 2018 to 8% in 2021[34].

The percentage of government spending directed towards schooling should be sensitive to the school-age population as a proportion of the total population. The extent to which the 18,1% to 17,3% decline in basic education's share of non-interest spending between 2017 and 2022 seen in Table 2 is justified by changes in the age distribution of the population is not clear. Statistics South Africa mid-year population estimates point to the population aged 5 to 19 declining slightly from 27,3% to 27,1% between 2017 and 2022, a smaller decline than the decline in the spending percentage. The Thembisa projections, on the other hand, point to the percentage of the population aged 7 to 18 increasing from 20,9% to 21,7% over the same period[35].

The national demand picture conceals province-specific realities. The most striking province-level change has been the increase in Gauteng's enrolments, from 10% to 20% of the national total between 1994 and 2023, alongside Eastern Cape's decline from 23% to 13%. Details in this regard appear in Appendix A.

The learner-educator (LE) values in Table 2 display an increase of 0,06 a year, using a linear trend, for 2017 to 2022, though growth in the educator workforce in 2023 results in a less steep trendline increasing by just 0,01 points a year over 2017 to 2023. The increase was steeper before 2017. In 2011 the LE ratio was 27,4, compared to 29,8 in 2017. It has been estimated that without substantial further growth in the number of educators, and given the context of growth in the school-age population, the LE ratio would reach 31,6 in 2030. To provide a sense of the impact of changes to the LE ratio, a rise of 1,0 translates to approximately 200 000 additional grades 1 to 3 learners being in classes exceeding 40 learners[36]. However, the expected worsening of the LE ratio does not take the schooling system into completely new territory. The possible rise in the LE ratio by 4,2 between 2011 and 2030 is not very different from the 3,0 decline in the ratio in the earlier 2003 to 2011 period[37]. Yet service delivery would be negatively affected if schools were to return roughly to the situation seen in 2003.

Turning to private spending by households on schooling, school fees across public and independent schools contributed around R6,7bn to the sector in 2017, or 3% of total public spending by provincial departments[38]. The percentage of learners not paying fees has declined considerably and continuously over the longer term, from 50% in 2009 to 76% in 2022[39].

A 2007 UNESCO report on education financing in developing countries found South Africa to have among the most equitable systems[40]. The basic elements of school funding in South Africa have, if anything, become more equitable since then. Yet there remains room for improvement. The education component of National Treasury's equitable share formula is driven by enrolment and school-age population statistics, and thus promotes across-province equity, even if ultimately the provincial government decides how much to spend on schooling, relative to other sectors. At one end of the spectrum, Gauteng's education component in the formula came to 20,7% of the national total for the 2024/25

34 Department of Basic Education, 2023: 10.
35 www.thembisa.org.
36 Department of Basic Education, 2020a: 30.
37 Department of Basic Education, 2020a: 30.
38 Department of Basic Education, 2017b.
39 Department of Basic Education, 2023: 29.
40 Sherman and Poirier, 2007.

financial year, while the province accounts for 19,5% of national enrolments. This puts Gauteng at an advantage. Least advantaged is Limpopo, whose education component is 12,5% of the national total, while enrolments are 13,4% of the total[41]. Some of these types of discrepancies are linked to the population element in the education component, which among other things rewards provinces with lower levels of grade repetition. Taking account of differing burdens of poverty across provinces, and consequently different impacts of the school allocation targets, is a matter that is currently receiving attention. To illustrate, taking into account the school allocation would raise Limpopo's education component from 12,5% to 12,6%. The changes would thus not be that large, though they would enhance across-province spending equity.

In terms of within-province public spending equity, formulas for distributing educator posts and the school allocation funds remain vital for maintaining equity. A study of within-province equity with respect to per learner funding in 2016 confirmed that the system of policies largely work as they should: total current per learner spending in quintiles 1 to 3 schools was around 5% higher than for historically more advantaged quintiles 4 and 5 schools[42]. At the province level there are a few concerning deviations from this pattern, but these deviations are small, and do not detract from the overall equity of the system. What has not been systematically calculated is the extent to which public spending on intervention programmes, such as those of the National Education Collaboration Trust (NECT), and which are not driven by legislated formulas, improve the overall pro-poor pattern of spending. The extent is likely to be noteworthy.

41 All four values obtained from Annexure W1 of *2024 Budget Review.*
42 Department of Basic Education, 2018a: 18.

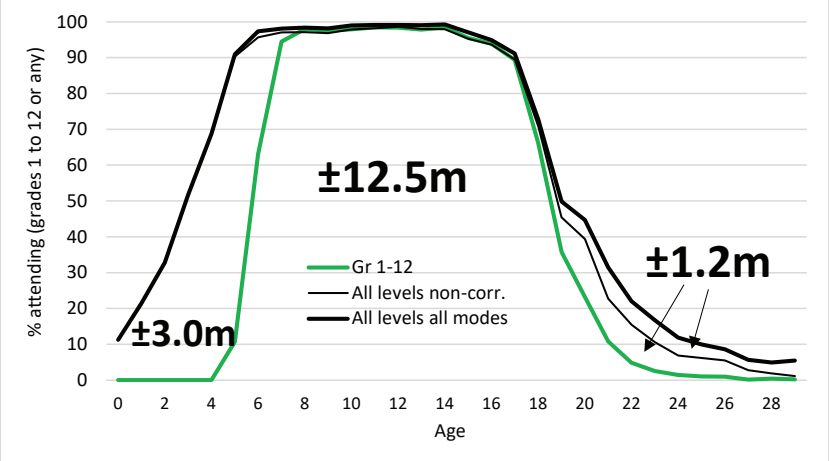
4. PARTICIPATION AND ATTAINMENT IN BASIC EDUCATION

4.1 Participation in ECD and schooling by age

With the 2021 proclamation that all early childhood development centres should become the responsibility of the departments of basic education, this sector became responsible for 93% of all education participation in the country. The sector is large in part as it is exceptionally successful, in the global context, of retaining learners at school beyond age 15, the maximum compulsory school age. At the same time, the presence of clearly over-aged learners has been reduced: in 2003 9% of youths age 20 to 29 were still in school, a figure that had dropped to 4% by 2022.

Figure 6 below illustrates participation in various forms of education according to the 2022 General Household Survey (GHS). Grades 1 to 12 schooling accounts for 75% of all education participation for ages 0 to 29, the figures for pre-Grade 1 participation and post-school participation being 18% and 7% respectively. All this means that since Proclamation Notice 21 of 2021, which transferred all early childhood development centres to the basic education sector, this sector has accounted for 93% of educational participation (75% plus 18%). This 93% translates to around 15.5 million children and youths (3,0 plus 12,5 from Figure 6).

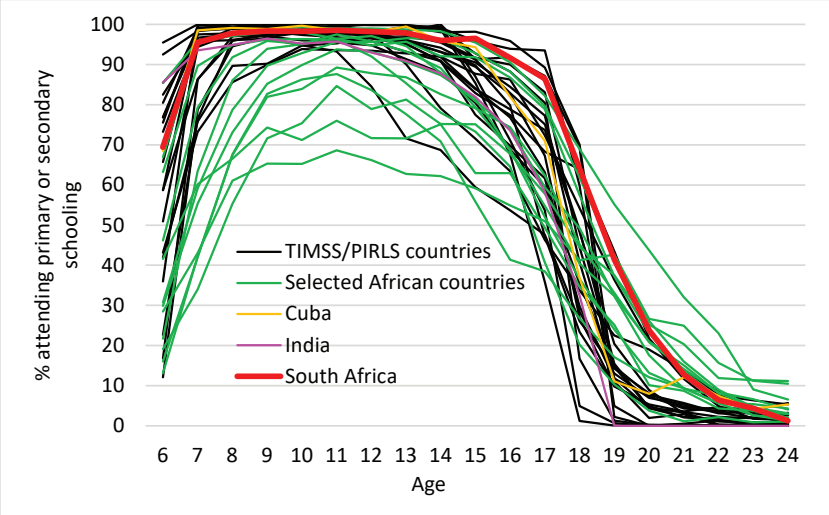
Figure 6: Educational participation by age in 2022



Source: General Household Survey 2022 microdata. 'All levels non-corr.' is any participation in any education that is not *through correspondence. 'All levels all modes' includes correspondence. The 'Gr 1-12' curve includes a small correspondence element: there is virtually no correspondence mode below age 18, but from age 18 upwards, 1.3% of grades 1 to 12 participation is through correspondence. Estimates of number of children and youths in millions are GHS weights deflated to produce values in line with the numbers in the EMIS data. The education system's EMIS data points strongly to the need for such a deflation – see section 2.*

Figure 7 below compares South Africa's primary plus secondary school participation to that in other comparable countries, mostly developing ones. South Africa's participation rates are high. In the age 15 to 19 bracket, when school participation begins to decline substantially in many countries, South Africa's rate remain relatively high. Just three of the 33 countries other than South Africa in the graph have better participation rates for ages 15 to 19 as a group. The three are all European countries originally a part of Yugoslavia. The remaining 30 countries, which include Cuba, Colombia, Mexico, Philippines, Thailand and Turkey, all display lower participation rates.

Figure 7: School participation by age across 34 countries



Source: The 'Education Attainment and Enrollment around the World' database of the World Bank. This source in turn draws from household surveys.
Note: Of the 87 countries (mostly developing) with enrolment data for 2013 to 2019 in the database, 33 were selected, these being (a) 19 developing countries participating in TIMSS or PIRLS, (b) a selection of 12 important African countries not in (a), and then also India and Cuba. The median source year for the 33 countries was 2017. For South Africa (not among the 87, as the World Bank data did not include South Africa), GHS 2019 data were used. There are thus 34 countries represented.

Despite concerns that the pandemic would have lasting negative impacts on participation, South Africa's 2022 participation patterns are very similar to those of 2019, just before the pandemic. In both 2019 and 2022, according to GHS data, grades 1 to 12 enrolment over the population aged 5 to 19 remained at 84%. This statistic has been relatively constant over the longer term: in 2003 it was 82%[43]. However, youths aged 20 to 29 still in grades 1 to 12 has steadily declined: from 9% in 2003, to 6% in 2012, to 5% in 2019, and 4% in 2022. This reduction in over-aged participation has been achieved while attainment of the Grade 12 National Senior Certificate (NSC) has steadily improved – see section 4.5 below.

In terms of legal obligations, it is important for the schooling system and society as a whole to ensure that children are in school from the year in which they turn seven, to the year in which they turn 15. For ages 7 to 15, participation was 97% in 2022, and for ages 7 to 14 it was 98% (it is legally permissible to be out of school when aged 15, if the last birthday was in the previous calendar year). The Basic Education Laws Amendment (BELA) Bill would extend the minimum compulsory attendance range by one year, to age six. Data on age six in the 2022 GHS reveal that 97% of children attend some education institution, though only 85% attend a school. This points to a BELA challenge, namely one of shifting more Grade R enrolment into schools, from pre-schools, or converting pre-schools into schools.

The reason why participation rates at the compulsory ages fall slightly short of 100% is not well understood, and could in part be due to problems when the household data are collected. The rate for many years, of around 98%, barely differs by province, gender or even population group[44].

Two noteworthy changes in participation in the last two decades stand out: increases in participation both below Grade 1 and in the post-school sector. Pre-Grade 1 participation among children aged 0 to 6 improved from 19% in 2003, to 40% in 2012, reaching around 43% in 2019 and 2022[45].

43 Pre-2022 statistics quoted here are also calculated from the GHS microdata.
44 Department of Basic Education, 2023.
45 Wills *et al* (2021) provide a detailed breakdown of the ECD participation improvements, which takes into account changes in the GHS questionnaire over time. That breakdown is broadly in line with the figures provided here, and confirms that

The percentage of youths aged 19 to 29 participating in some form of post-school education improved from 5,4% in 2003, to 7,9% in 2012, to 8,4% in 2019, and to 11,6% in 2022. In the couple of decades preceding the pandemic, post-school education via correspondence has accounted for around a fifth of all post-school participation. This has doubled, to 40% of all post-school education in 2022, which probably reflects the greater reliance on hybrid approaches prompted by the pandemic[46].

4.2 Access and the use of the eleven official languages

Mother Tongue-based Bilingual Education (MTbBE) requires a focus on the use of the mother tongue for teaching and learning at the primary level, in order to provide meaningful access to schooling for learners. In several respects the system has embraced the approach. In Grade 3, 75% of learners are taught using their mother tongue. The data suggest that much of the challenge lies in improving how the mother tongue is used up to Grade 3, particularly for the historically marginalised African languages, and greater use of mother tongue teaching beyond Grade 3.

The 1997 language policy for the schooling system[47] emphasises two things. Firstly, it promotes historically marginalised languages as part of the process of bringing about a more equitable society. Secondly, it protects individual freedoms as far as is practically possible when it comes to the choice of language of learning and teaching (LOLT). LOLT is a critical matter given that research, including South African research[48], suggests strongly that the use of the learner's mother tongue as a LOLT facilitates learning. The renewed emphasis on language in schooling, specifically Mother Tongue-based Bilingual Education[49] (MTbBE), introduces new research imperatives and underscores the importance of analysing the available data on the home languages of learners, and their LOLT. This section presents an overall picture of the current situation, using 2023 EMIS[50] data. The focus is on Grade 3, presently the last grade at which all eleven official languages are widely used as the LOLT.

Figure 8 below draws from both public and independent schools, and reflects the home languages of learners as reported by the school. The numerically largest language among Grade 3 learners in each area is shown. The absolute numbers by province and language are shown in Table 4 in the appendix.

particularly steep improvements occurred in the decade preceding 2012.

46 The GHS question is 'The student studies by post/through the internet (e.g. UNISA) in a correspondence/distance/online institution'. It is possible that a 'yes' response will be given in the case of a hybrid approach.

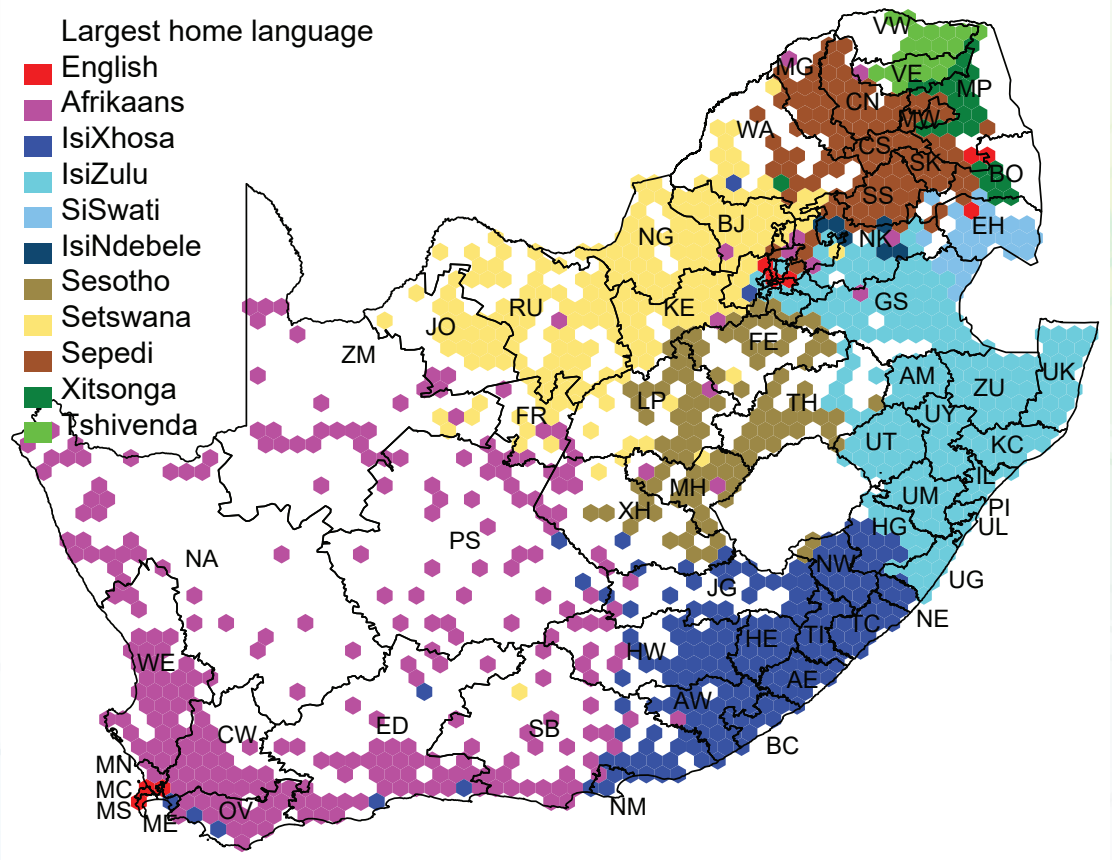
47 Notice 1701 of 1997.

48 Taylor and Von Fintel, 2016.

49 Mbude, 2019.

50 Education Management Information System.

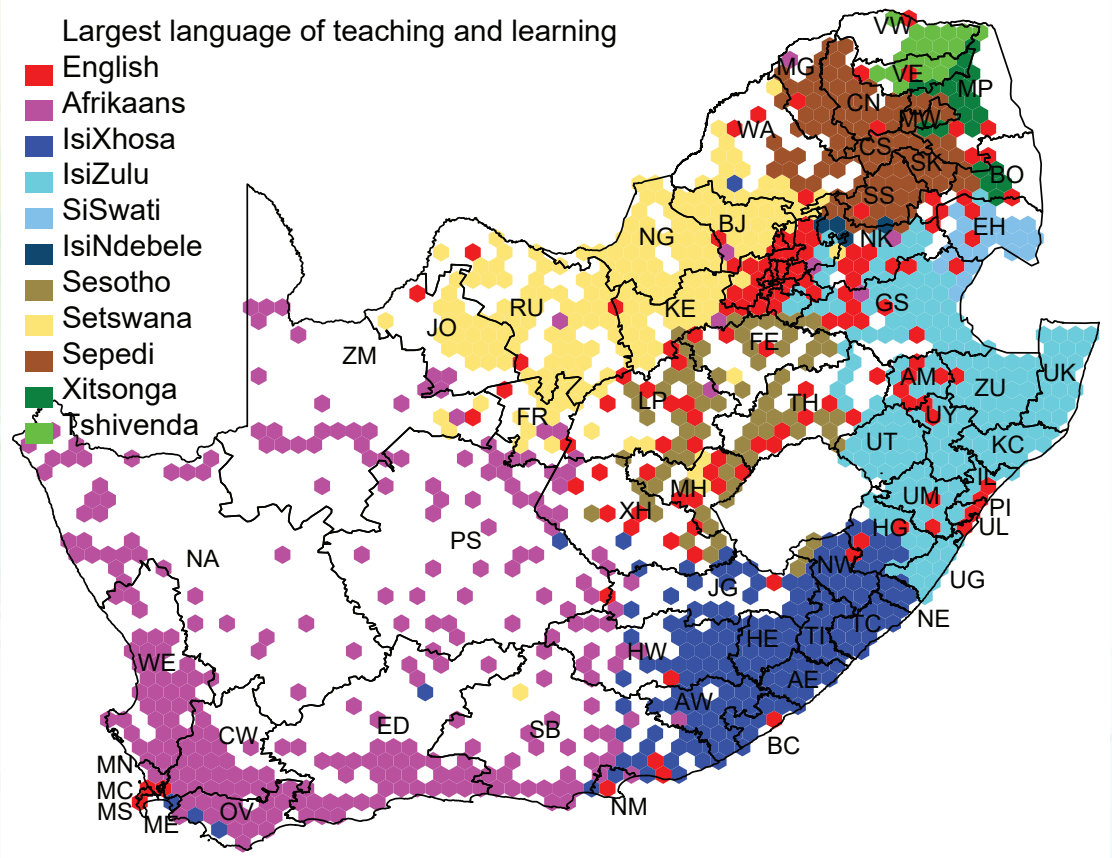
Figure 8: Home language in Grade 3 in 2023



Source: EMIS data.
Note: All types of schools are included in this analysis, and that of the next two maps. For the maps, the country has been divided into hexagons around 24 km wide, with schools at the perimeter of the country assigned to the closest hexagon. Blank spaces represent areas with no school with Grade 3 enrolment.

Figure 9 below is similar to the previous map, except here the largest LOLT is reflected. The key change is the stronger presence of English. While 8% of Grade 3 learners have English as their home language, 32% of all Grade 3 learners are taught using English as a LOLT. The figures if only public schools are considered are 5% and 28%.

Figure 9: Language of learning and teaching in Grade 3 in 2023

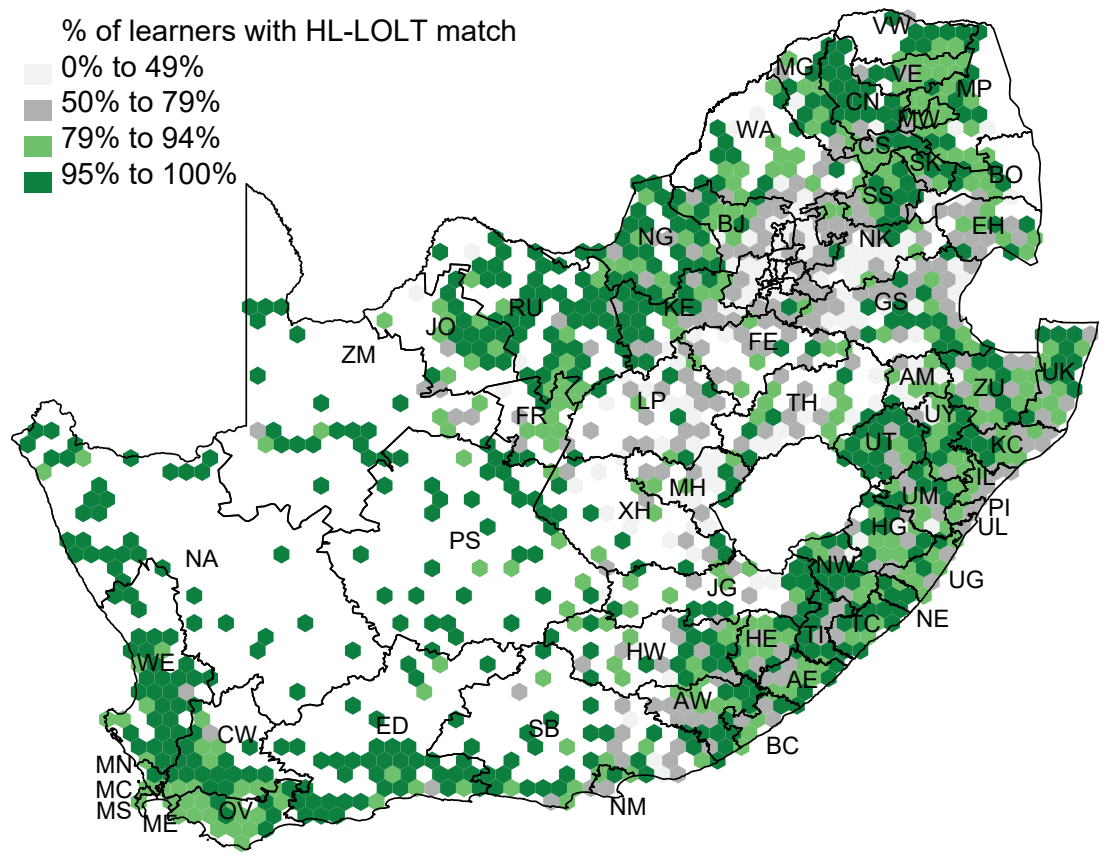


While the above two maps provide a general picture of the home languages of learners for whom English is the LOLT, exact statistics are provided by Table 5 in the appendix.

Across all schools, 73% of Grade 3 learners were taught in their home language in 2023[51]. Almost all learners whose home language is English also experienced English as their LOLT. One relatively small language, namely IsiNdebele, saw just 50% of speakers of the home language enjoy IsiNdebele as their LOLT. Details are provided in Table 5 in the appendix. What stands out is that for one relatively large home language, namely Sesotho, a rather low percentage of learners experienced the home language as the LOLT, specifically 52%. And 39% of Sesotho home language learners in public schools had English as their LOLT. These figures are 70% and 23% if the other eight African languages are combined. Closer analysis of the data revealed that two factors explain the Sesotho situation. Firstly, Sesotho home language learners are the most likely to be in Gauteng, among all nine African languages. The linguistic diversity of urban Gauteng lowers the probability that an African home language will be the learner's LOLT. Secondly, even within Free State, the province with most Sesotho home language speakers, linguistic diversity is relatively high. Yet when controlling for these and other structural factors, the data suggest that Free State pursues strategies which reduce the probability of a home language-LOLT match somewhat. Figure 10 illustrates the degree of this matching across the country. The relatively low levels of language matching in Free State, Gauteng, but even Mpumalanga, are visible.

51 For public schools the figure is 75%.

Figure 10: Percentage taught in home language



The data point to how large the scope for different forms of action in terms of MTbBE is. For the 58% of Grade 3 learners in the public system for whom the mother tongue is one of the nine African languages and the LOLT matches the home language, what is needed is better use of the African LOLT in the classroom, in particular for the teaching of literacy and numeracy. The schools of these learners are moreover clear candidates for better use of an African language beyond Grade 3, in a manner that draws lessons from work in the Eastern Cape. The data point to 5% of Grade 3 learners in public schools being African language home speakers experiencing English as the LOLT, although at least 95% of learners speak the same African language. Of the around 47 000 learners concerned, around 21 000 are learners in KwaZulu-Natal with isiZulu as the home language, 6 000 are isiXhosa-speaking learners in Eastern Cape, and 5 000 are Sesotho-speakers in Free State. For these learners, it is important to investigate why English and not the mother tongue is used for teaching, and whether learning could be enhanced through effective use of the mother tongue.

4.3 Enrolments in grades R to 12 over time

Enrolments in ordinary schools increased by 17% between 1994 and 2023, largely due to a larger secondary (grades 8 to 12) level. Though independent ordinary enrolments tripled over the period, by 2023 public schools still accounted for 95% of enrolments. At the province level, remarkably large changes in enrolments over the 30-year period were seen, from increases of 89%, 46% and 43% for Gauteng, Northern Cape and Western Cape respectively, to a reduction of 28% for Eastern Cape – here grades 1 to 12 are considered.

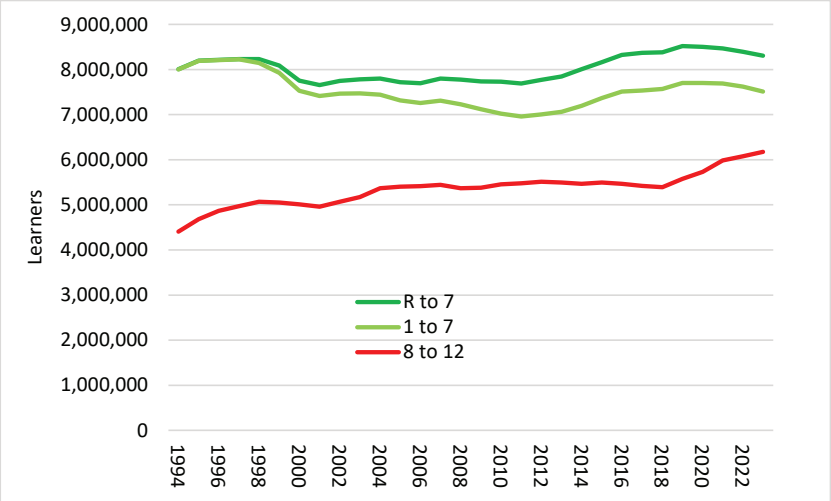
The COVID-19 pandemic shifted grade repetition patterns substantially: in 2019 12% of learners were repeating their grade, against 8% in 2021, a change mainly attributable to changes in the promotion rules during the pandemic.

As can be seen from Figure 11 below, over the last three or so decades the secondary level (grades 8 to 12) has expanded relatively quickly, while moderate expansion at the primary level is largely due to growth in Grade R[52]. Overall,

52 This section discusses trends for ordinary schools only. This means that special schools, which have comprised around 0.9% of total school enrolments over the period, are not included. Special school enrolments, in particular by grade, have not been as systematically reported on as enrolments in ordinary schools.

grades R to 12 enrolments in ordinary schools grew by 17% between 1994 and 2023. The secondary level comprised 35% of all ordinary school enrolments in 1994, and 43% in 2023. The great majority of the schooling system remains public, even though a fairly continuous increase in the independent school sector has resulted in a tripling of independent enrolments over the 29-year period. In 2023, 94% of grades R to 7 enrolments were in public schools, while the figure was a slightly higher 95% for grades 8 to 12[53].

Figure 11: Enrolment in all ordinary schools by level since 1994



Source: Official enrolment publications for 1999 onwards. For 1994 to 1997, an Excel file provided by Luis Crouch, who worked in the DoE at the time, was used. For 1998, no values seem available, and hence the average across 1997 and 1999 was used. For 1994 to 1997, independent school enrolments were excluded. A small upward adjustment was made using the assumption that the proportions of 1999 applied.

Provincial total enrolment trends, discussed in Appendix A, have differed vastly. Increases for grades 1 to 12 enrolments between 1994 and 2023 range from highs of 89%, 46% and 43% for Gauteng, Northern Cape and Western Cape respectively, to reductions of 28% and 13% for Eastern Cape and Limpopo respectively.

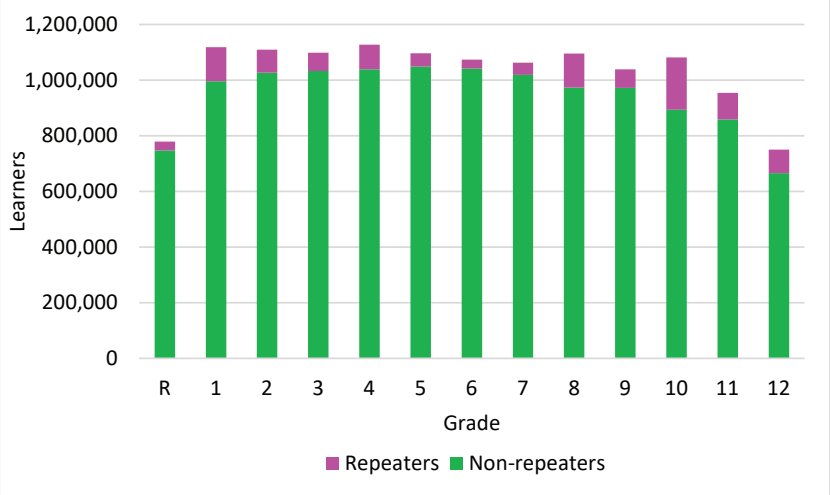
The ability of the education departments to monitor how learners move through the schooling system from one year to the next has improved vastly in recent years. The publication in 2023, by the Department of Basic Education (DBE), of a comprehensive report on promotion, repetition and dropping out in recent years, based on the sector's EMIS[54] data, marks an important milestone and is the culmination of many years of investment in systems development[55]. In short, the migration from a system of school surveys collecting totals to a system based on individual learner records has been a success. While household data will remain an important source for gauging phenomena such as grade repetition, EMIS data is increasingly seen as the most reliable source for several key indicators.

53 For all grades, the figure is 95%.
54 Education Management Information System.
55 Department of Basic Education, 2023b.

In 2021, the last year for which verified repeater statistics are available, 8,0% of all learners in ordinary schools were repeating their grade, counting grades R to 12, and including independent schools. As shown in Figure 12, in 2021 repetition was particularly high in grades 1, 8 and especially 10. This reflects difficulties experienced by learners as they embark on a new phase or level of the schooling system. The 8% aggregate figure was a considerably higher 12% in 2019. This reflects policy changes[56] during the pandemic aimed at avoiding unacceptably high levels of repetition resulting from the school disruptions. In fact, the system responded by reducing repetition relative to what it had been before the pandemic, though even before the pandemic there had been a gradual decline. Specifically, there was approximately a three-percentage point decline in the percentage of learners repeating, between 2013 and 2018[57].

Preliminary analysis of post-2021 enrolment data point to the percentage of learners repeating their grade, across grades R to 12, rising slightly above the aforementioned 2021 level of 8,0%. By 2023, the figure was 8,7%, still considerably below the 12% seen just before the pandemic.

Figure 12: Repeaters and non-repeaters in ordinary schools 2021



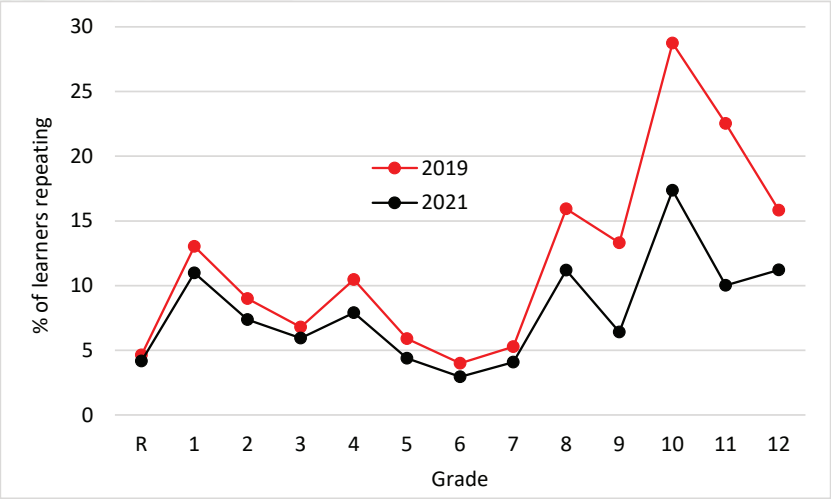
Source: Official enrolment reports and Department of Basic Education (2023b). Note this latter source reports learners who repeated across 2020 and 2021, which together with official enrolment figures for both years allows for the analysis of this graph.

Figure 13 illustrates at which grades the largest declines in repetition occurred. Though the policy changes focussed particularly on the secondary level, even at the primary level there was some decline, across all grades, between 2019 and 2021. The fact that even after these declines, in 2021, the percentage of Foundation Phase (R to 3) learners repeating was 7%, is noteworthy. There are both pedagogical and class size arguments that would favour less, even zero, repetition in the Foundation Phase. If repetition were abolished, roughly class sizes would decline by around 7%, which would significantly address the serious problem of over-sized classes at a critical point in the schooling process where as much individualised attention as possible is needed.

56 See DBE Circular S7 of 2020, titled 'Revised promotion requirements for Grade 10 and 11 for the 2020 academic year', also DBE Circular S17 of 2021.

57 Department of Basic Education, 2019a. The decline in this report is from 11.8% to 8.8%. These values are low, most probably because households are somewhat reluctant to admit that children have repeated. However, the downward trend over time almost certainly reflects an actual decline. The repeater statistics behind Figure 9 and Figure 10, which are based on learner-level records collected from schools, can be considered highly reliable.

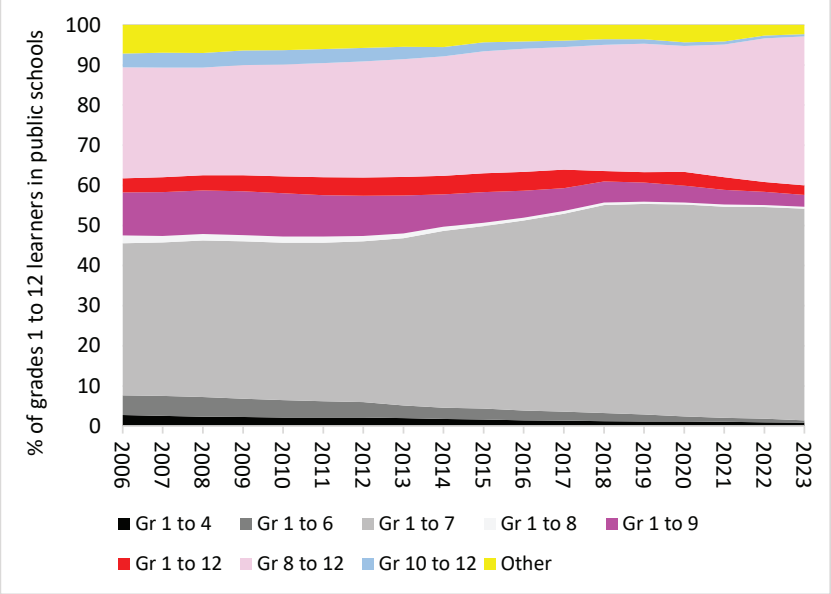
Figure 13: Percentage repeating in 2019 and 2021



Source: Department of Basic Education, 2023b.

What grades each school offers has implications for participation, but also teaching and learning. For instance, if a school extends to Grade 9 only, and learners require enrolment in another school to complete schooling to Grade 12, then the risks are higher than youths will drop out of school after Grade 9. Figure 14 illustrates that the percentage of learners enrolled in either typical primary schools, with grades 1 to 7 (and possibly Grade R) or typical secondary schools, with grades 8 to 12, has increased. In 2006, 66% of learners were in these two types of schools, with this rising to 90% in 2023. This change is largely accounted for by a major restructuring process in Eastern Cape, described in Appendix A.

Figure 14: Grade configurations 2006 to 2023



Source: Up to 2016, 'SNAP' enrolment dataset available through UCT's DataFirst. For 2017 and beyond, individual-level LURITS data of the DBE.

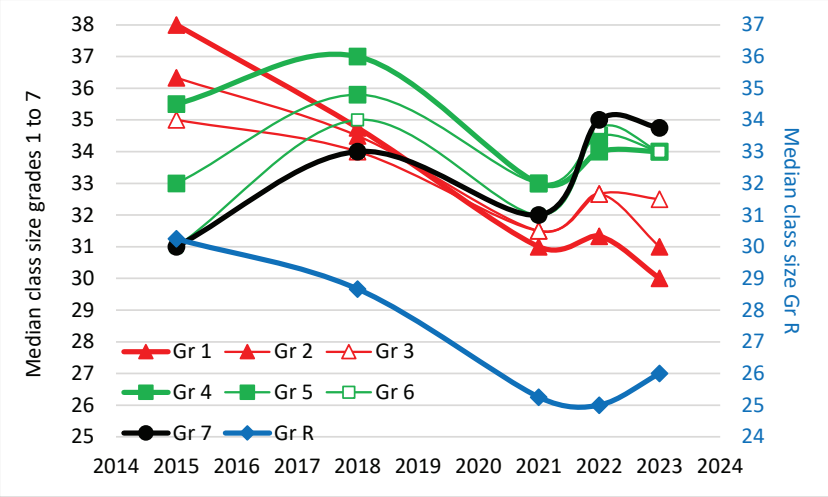
4.4 Class sizes

Learners in classes exceeding 40, in particular at the primary level, is a concerning phenomenon. Improved data on class size point to around half of primary learners being in classes exceeding 40 in the years since 2015, and around 15% being in classes exceeding 55. The data also suggest that despite learner-educator ratios remaining roughly static, the prevalence of excessive classes has declined very slightly. Yet the problem remains large. Arguably the least difficult approaches to easing the situation are reducing grade repetition, adding classrooms to schools where needed, and improving the utilisation of teaching time through better timetabling.

Excessive class sizes remain a serious concern in the South African schooling system. Reasons for this problem include high learner-educator (LE) ratios across the system, poor use of teaching time in schools, and classroom shortages. With regard to the first of these three factors, the evidence suggests that at the primary level the LE ratio is higher than the middle income country norm by around 5 learners. Put differently, it should drop from around 30 to 25 to be in line with what is found in other countries[58]. There are two key ways of addressing this: hiring more teachers and lowering grade repetition. With regard to how the use of teacher time and classroom availability affect class sizes, the exact nature of the problem, and how to resolve it, have been the subject of some research but are still insufficiently understood[59].

Given the need for smaller classes among younger learners, who are less able to manage their own learning, and given that the data on class size are less complex at the primary level compared to the secondary level, where subject choice is common, this section focusses on the primary level. Figure 15 below illustrates class sizes experienced by the median primary learner per grade over the 2015 to 2023 period. The trends are influenced by the 2003 to 2005 births surge (see section 2). To illustrate, those born in that period would have been in around Grade 7 in 2018, which explains the Grade 7 peak in 2018 in the graph. Grades 1 to 3 class sizes were on the decline after 2015 as the births surge had already passed through those grades.

Figure 15: Class size changes nationally 2015 to 2023



Note: This graph draws from the data of 11,771 public ordinary schools. For each year, the same 11,771 schools underlie the statistics. Schools with missing data for any year were thus excluded, to improve comparability over time. The exception was Western Cape, where the class variable was missing for all schools in 2018. Here the means per school across 2015 and 2021 were used.

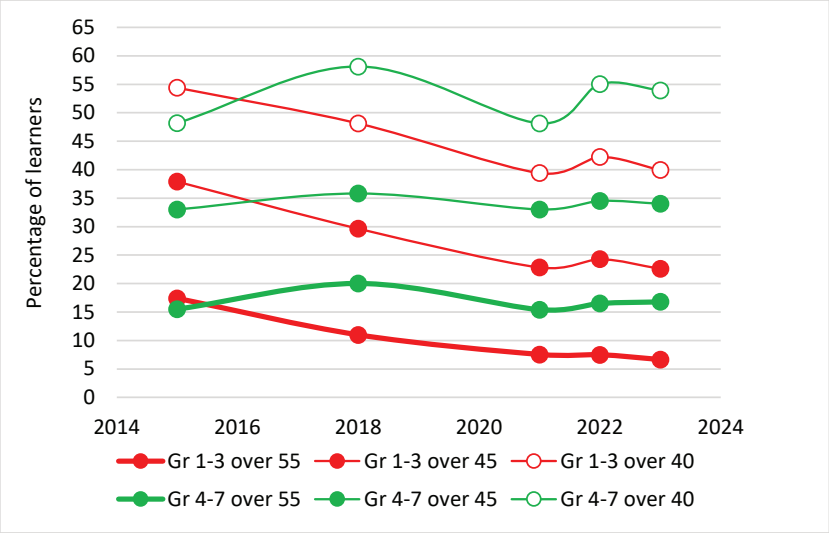
It has been speculated that a worsening class size situation could explain the lack of progress in Grade 5 mathematics between 2015 and 2019, according to TIMSS[60]. The TIMSS data point to the percentage of assessed learners in classes

58 Department of Higher Education and Training, 2020: 44.
59 See for instance Wills (2023).
60 Trends in International Mathematics and Science Study.

with over 50 learners increasing from 16% to 34% over the period[61]. That would be in line with the above graph, which indeed points to a worsening of the class size situation for Grade 5 learners between 2015 and 2018. However, the graph also points to an easing of the class size situation for Grade 5 after 2018 – TIMSS was again run for Grade 5 in 2023.

Figure 16 below should be understood in the context of policy which stipulates that classrooms are built to accommodate up to 40 learners[62]. Around half of grades 1 to 7 learners have in recent years found themselves in classes with over 40 learners. Between 5% and 20% of learners were in classes with more than 55 learners, depending on grade and the year examined.

Figure 16: Learners in over-sized classes by school phase

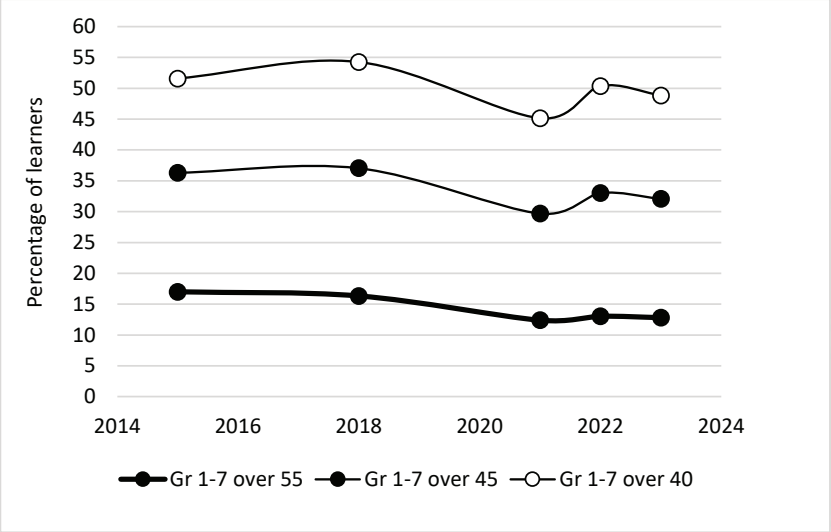


Note: The grades 1 to 3 statistics are based on 14,564 schools covering 89% of official public school enrolments in these grades. The figures for the grades 4 to 7 trends in the graph are 12,802 schools and 79% of learners. These coverage levels are arguably sufficient. There is no reason to believe that schools without all the required data, or which do not comply with the grade configurations used for the analysis, would display trends substantially different to those in the graph. To illustrate the grade configuration requirement, for the grades 4 to 7 statistics, only schools which offered all grades in the range 4 to 7 were considered.

Figure 17 aggregates the primary grades 1 to 7. There has been a slight improvement with regard to excessive class sizes insofar as the three curves display a downward slope. This is despite the fact that the trend for the LE ratio for the public schooling system as a whole has remained more or less at the same level – see Table 2. This serves as a reminder that although the LE ratio and class sizes are closely related, other factors, such as the management of time in schools, also play a role. A priority should be to reduce the prevalence of the very largest classes, of more than 55 learners. As seen in Figure 17, this remains at around 15%, even if the statistic has dropped slightly.

61 Spaull *et al*, 2022.
62 Regulation 920 of 2013.

Figure 17: Learners in over-sized classes at the primary level



4.5 Attainment of grades 9 to 12

Household data indicate that a young South African who is likely to obtain a Grade 12 or equivalent qualification will have obtained it by age 25, and that in 2022 62% of youths reached this level of education. Before the pandemic, South Africa was a little behind other comparable countries with respect to the successful completion of twelve years of education among youths, but a large improvement during the pandemic put South Africa on a par with its international peers. This improvement, driven largely by changes to the promotion rules for grades 10 and 11, saw the 2022 number of National Senior Certificates (NSCs) achieved reach a level that was 21% higher than pre-pandemic trends would have predicted. A question that is now easier to answer, given better sharing of data between the two national education departments, is how many youths obtain a qualification from a TVET college that is equivalent to the NSC, without already having the NSC. The figure is low, with only around 3% of such qualifications obtained for the first time being from a TVET college.

Turning to successful completion of Grade 9, this was around 90% in 2022. Successful completion of grades 9, 10, 11 and 12 has steadily improved over the years. For instance, attainment of Grade 12, or something equivalent, rose from 45% in 2008 to the abovementioned 62% in 2022. Eastern Cape saw the steepest improvement in the number of NSCs obtained by youths, though this province also experienced the steepest enrolment declines, due to demographic factors. This would have been facilitated by a major restructuring process whereby the proportion of Grade 9 learners needing to move to another school to complete Grade 12 was substantially reduced.

Improvements in the availability of EMIS data at the individual learner level have greatly facilitated the monitoring of who obtains the NSC, and the crucial matter of learners who migrate while in school and obtain the NSC in another province. The provinces with the highest NSC attainment figures are Limpopo, KwaZulu-Natal and Mpumalanga. None of these three provinces are among the top three provinces with respect to the Grade 12 pass rate. This underscores the importance of not focussing narrowly on just the pass rate.

The percentage of South Africans who attain specific levels of education, in particular successful completion of twelve years of education, is a matter of great public interest, but has also been a source of considerable confusion. A percentage is obtained by dividing a numerator by a denominator, and both of these can give rise to difficulties. However, South Africa's data are good enough to obtain a sufficiently accurate picture of the situation.

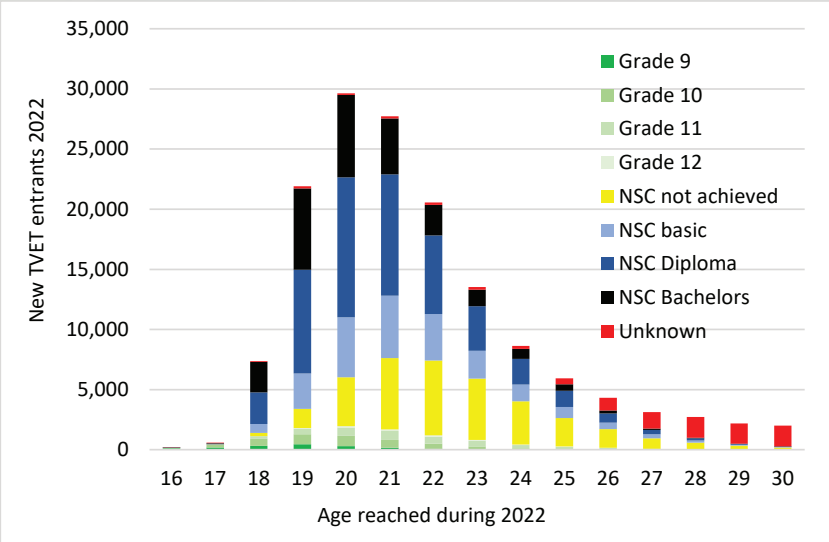
With regard to the numerator, it should be kept in mind that the commonly referred to number of National Senior Certificate (NSC) passes obtained after the year-end examinations does not account for all National Qualifications Framework (NQF) level 4 qualifications. What is excluded are some 39 000 NSCs obtained by part-time candidates outside the year-end process[63], around 10 000 NSCs obtained through the Independent Examinations Board (IEB), and

63 Department of Basic Education, 2019b.

around 6 000 Amended Senior Certificate (ASC) qualifications obtained through a separate public route[64]. In addition, of the approximately 65 000 NQF level 4 qualifications issued by public and private TVET colleges each year, around a third are accounted for by youths who do not already have the NSC or ASC[65]. Further complicating the picture is the fact that each year around 4 000 NSCs are not obtained for the first time, but in a repeat exercise aimed at improving subject marks in the qualification. If all these figures are viewed against the 2020 total number of public year-end full-time candidate NSCs, of 440 702, then it is clear that the year-end figure should be raised by around 18%.

Figure 18 is the outcome of new analysis made possible in 2024 through a new data-sharing agreement between the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET). It points to 30% of first-time public TVET college students in 2022 not already being in possession of the NSC. This analysis is in line what household surveys have suggested for some time, namely that a very low percentage of youths who obtain an NQF level 4 qualification for the first time do so at a college – the figure is around 3%.

Figure 18: What 2022 TVET first-time students left school with



The comparison of DBE and DHET data moreover confirm that many learners enter a programme in a TVET college which is, in terms of the National Qualifications Framework (NQF), below the last level they experienced at a school. This was true for 49% of TVET college first-time entrants over the 2017 to 2022 period. A common example would be a learner holding an NSC from a school (NQF level 4) entering NC(V) Level 2 training in a college. This represents a movement down two NQF levels.

Turning to the denominator, Stats SA mid-year population estimates (MYPE) are clearly over-estimates as far as the school-age population is concerned – see section 2 above. Significant discrepancies between enrolment and population figures are common in developing countries. One solution is to use EMIS[66] data on learners at an age where virtually all learners are in school as a basis for a denominator. This has been done in for instance Department of Basic Education (2016: 61).

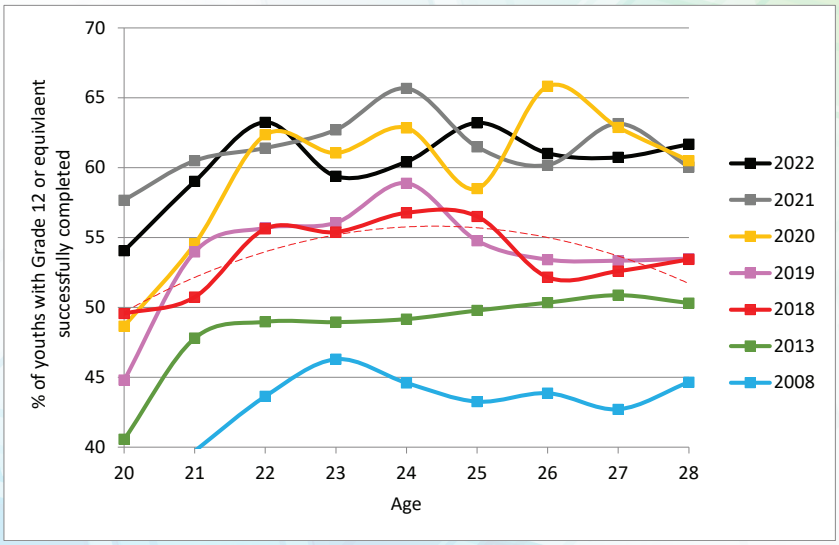
64 In the 2019 May/June examinations, of 100,825 ASC candidates writing the examinations, only 6,952 took 'the full complement of subjects', and only 700 of these candidates obtained the certificate (SAnews, 2019). Thus, around 94,000 did not take the full set of subjects. To obtain a rough idea of how many of the 94,000 obtained the NSC as a result of their participation in the 2019 mid-year examinations, one can use the ratio of NSC recipients to candidates among *part-time* NSC students. This has in recent years been around 6%. This suggests around 5,632 of the 94,000 obtained the ASC, and if one adds the 700, this gives about 6,000 certificates a year in total.

65 In 2020 public colleges issued around 13 000 NC(V) qualifications, and a further 35 000 N3 qualifications, all at NQF level 4, as is the case with the Grade 12 NSC (Department of Higher Education and Training (2022a). Qualifications issued by private colleges are not clear, but DHET reports and Stats SA household data point to private colleges accounting for around 30% of all TVET college enrolment. Around one-third of NQF level 4 qualifications in *public* TVET colleges are obtained by youths who did not previously obtain such a qualification. This is according to new analysis conducted in 2024 involving the merging of college and schools data at the level of individual (see Figure 15). The corresponding figure for private colleges is not known, but was assumed to also be one-third.

66 Education Management Information System.

Household data are advantageous as they involve drawing both the numerator and the denominator from the same data source. Figure 19 displays the percentage of youths by age who, according to General Household Survey (GHS) responses, have successfully completed Grade 12 or something equivalent. The general pattern is a slight rise, and then a drop. Younger youths, around age 20, are often in the process of obtaining a qualification, and have therefore not obtained it yet. Older youths on the other hand, for instance at age 28, are too old to have benefitted from the ongoing improvement in Grade 12 attainment. The pattern can clearly be seen for the 2018 points, for which a red dotted trendline appears[67]. The trendline assists in smoothing bumps in the curve due largely to the fact that the nationally representative data are sample-based. The top of the trendline, situated at age 24, is 55,8%. It can be concluded that 2018 patterns point to around 55,8% of youths successfully obtaining the NSC or something equivalent[68].

Figure 19: Successful completion of 12 years of education 2008 to 2022



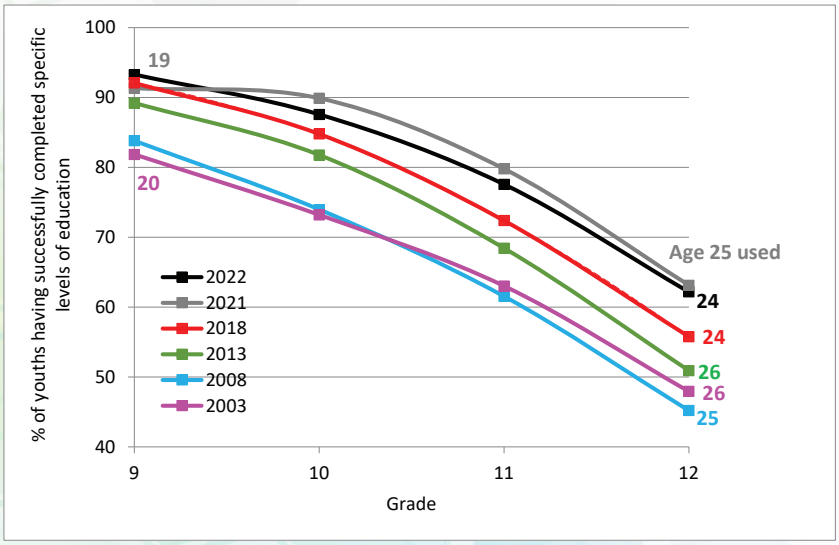
Source: Analysis of General Household Survey microdata.

Figure 20 below illustrates successful completion of grades 9, 10, 11 and 12, using the approach described above. To illustrate, in the case of 2018 the relevant age used is 24, and the attainment statistic 55,8%. The improvement in attainment across all the four grades for the years 2008 to 2022 is clear. For Grade 12, the improvement was from 45% to 62%. Irregularities, such as the apparent 2022 decline in Grade 9 attainment, are likely to be the result of the sample-based nature of the statistics. What is most important is the general trends. The fact that 2003 to 2008 saw relatively little progress is likely to be related to the very strong emphasis on Grade 12 pass rates, as opposed to number of passes, at the time. Emphasising only pass rates as a measure of success easily encourages schools to make academically weaker learners repeat below Grade 12, which in turn can lead to dropping out. In more recent years, a wider range of Grade 12 indicators of success has been promoted in the system.

Appendix A presents provincial trends for Grade 12 completion which indicate that provinces saw a gain of between 8 percentage points (Eastern Cape) and 22 percentage points (North West) in the 2009 to 2022 period[69]. Provincial trends are of course influenced by inter-provincial migration. For instance, the relatively small gains in Eastern Cape would in part reflect the greater likelihood that Grade 12 graduates would exit the province to study or work in another province. In fact, Eastern Cape saw the steepest increase in the number of year-end NSC passes during 2009 to 2022, which is especially remarkable considering that Eastern Cape has seen the largest declines in the school-age population and in enrolments – see Figure 59 and Figure 52 in Appendix A. All this reflects the fact that relative to the population, Eastern Cape has seen an exceptionally strong increase in the number of NSCs, off the country's lowest base, even if many NSC-holders leave the province soon after obtaining the qualification.

67 In Excel, an order 2 polynomial, also referred to as a quadratic equation.
68 The method is explained in detail in Department of Basic Education (2016: 66).
69 These statistics are based on slopes using all data points in Figure 54, not just the first and last points.

Figure 20: Successful completion of 9 to 12 years of education 2003 to 2022



Source: Analysis of General Household Survey microdata.
Note: Numbers in the graph indicate the age on the quadratic trendline used. In other words, this is the age by which all youths who are likely to obtain this level of education, have achieved it.

Household data can present problems, in particular because respondents may be embarrassed to reveal weak educational outcomes, and may thus over-state the level of education successfully completed. An alternative approach involving the use of EMIS enrolment data reveals patterns which are on the whole compatible with the findings based on household data. The analysis of Department of Basic Education (2016: 61) uses the fact, known from household data, that around 99% of 14-year-olds are in school, and then projects birth cohorts into future years. It was found that 2013 NSC passes, including NSCs of part-time and IEB candidates, over the population aged 18, was 53%. The 2013 value for Grade 12 in Figure 20 is a lower 51%. Some discrepancy between the two approaches can be expected.

A more comprehensive analysis[70] of EMIS data for later years reveals that of those born in 2003, who would turn 20 in 2023, 51% had obtained the NSC in the year-end public examinations process, as full-time candidates, in 2023 or before 2023. In Figure 21 below, this 51% would be the 434 731 learners born in 2003 and obtaining the NSC up to 2023 – the green marker in the 2003 column – divided by the 859 838 learners born in 2003 and found anywhere in the 2017 to 2021 EMIS data used[71] – the height of the 2003 pink bar. The black portion of the 2003 bar represents the approximately 22 544 individuals probably born in 2003, but without the required individual identifiers, who could therefore not be linked across the EMIS and NSC data. Analysis of the likely composition of this set of learners suggests they are unlikely to change the 51% finding.

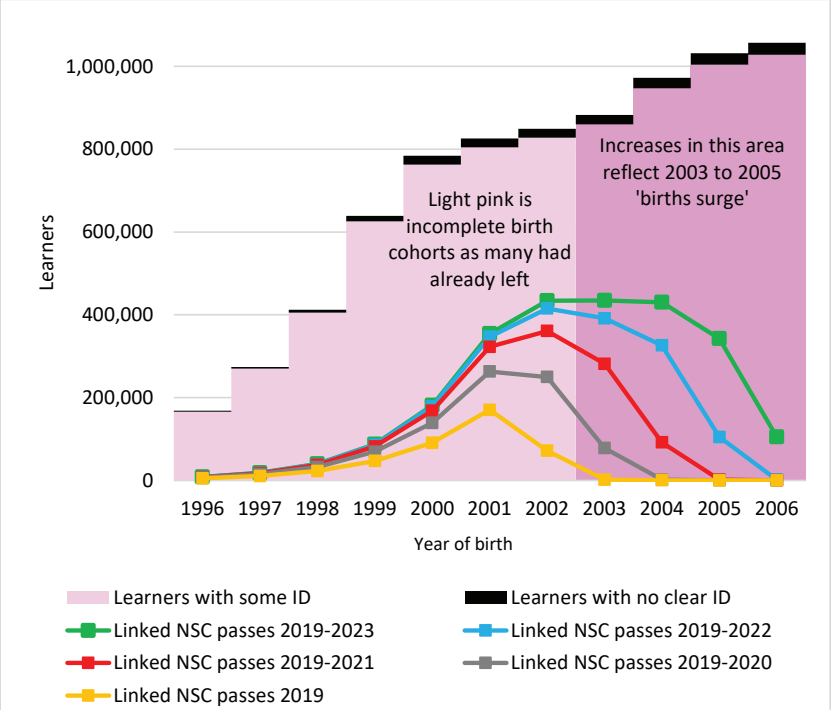
The analysis reflected in Figure 21 is more comprehensive than what has been undertaken previously as individuals have been traced over time across two different datasets. This represents a substantial improvement in the ability of the sector to monitor an important trend. However, further data work is needed to account for the full range of NQF level 4 qualifications using administrative data. Given that it is clearly common for youths to obtain this qualification as late as age 23 (see Figure 19), more years of EMIS and NSC data are needed. Moreover, data on private examination candidates and, within the public system, part-time NSC and ASC candidates who eventually obtain the qualification should be considered. Finally, school and college data need to be linked to clarify who obtains the qualification at a

70 Department of Basic Education, 2024b.

71 Learners born in 2003 would have been turning 14 in 2017, meaning around 99% of the birth cohort in the population would be covered. Learners in independent schools in the EMIS data are included. These learners are about twice as likely to write the public examinations as the IEB examinations. Special school learners are also included in the EMIS data which were used.

college without already having obtained it from a school[72]. Raising the 51% by the abovementioned margin of 12% to 23%, to take into account the different categories of the qualification, takes the 51% for the 2003 birth cohort to between 57% and 63%. This would roughly be in line with the evidence from the GHS discussed above.

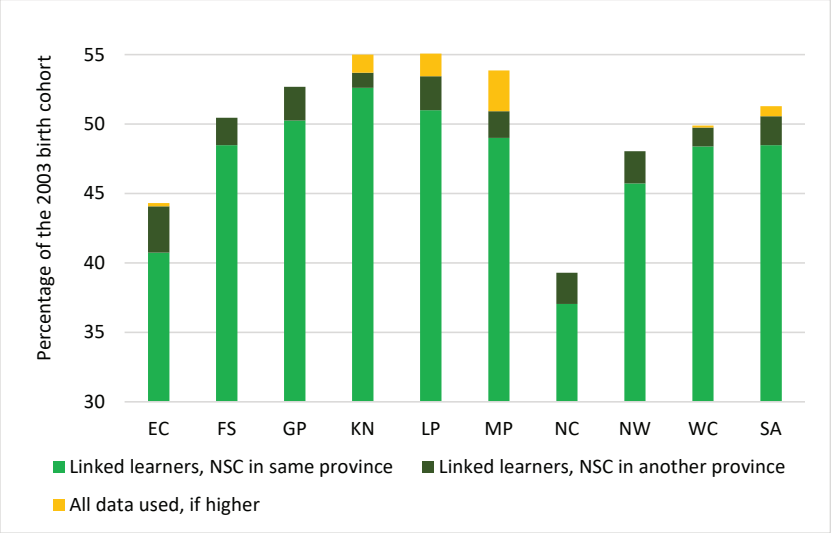
Figure 21: Enrolments linked to NSC achievers



The recent EMIS-NSC linking has also facilitated answers to a pressing question: to what extent do learners school in one province and then obtain the NSC in another province? Figure 22, which draws from the same approach as Figure 21, presents the picture. To illustrate, if learners born in 2003 whose earliest occurrence in the 2017 to 2021 EMIS data is in Eastern Cape are considered, then it is found that 44,3% of these learners obtained the NSC somewhere, in the public system and as a full-time candidate, in 2023 or before then. And it is found that 40,8% obtained the NSC for the first time in Eastern Cape. Put differently, one in 13 Eastern Cape learners obtain the NSC in another province. This figure would rise if EMIS data from before 2017 had been available for the analysis, as the migration of younger learners out of Eastern Cape would then have been taken into account. Figure 22 is important both for each province's total percentage of learners obtaining the NSC, and for the degree to which this occurs in another province. Yellow segments of the bars represent NSC achievers who could not be linked to the EMIS data. To illustrate, the yellow segment for Mpumalanga is most likely to represent learners whose schooling occurred mostly in that province, but some could have in-migrated from other provinces. The full bar for each province is the critical indicator for the extent to which learners obtain the NSC. The highest values are those of KwaZulu-Natal and Limpopo. Northern Cape clearly displays an exceptionally low figure. There is substantial out-migration from all provinces, but especially Eastern Cape.

72 Some analysis in this regard has been published. Department of Higher Education and Training (2022b) links 2019 NSC data from the schooling system to 2020 college enrolment data. Though the analysis provides important new insights, it is limited by using just one year of data from each source, which means it is not possible to identify, for instance, learners obtaining the NSC and waiting a year before enrolling at a college. New work commencing in 2024 has used a far wider range of years for this type of analysis – see Figure 15.

Figure 22: NSC survival rates (year-end, virtually all full-time) for 2003 birth cohort



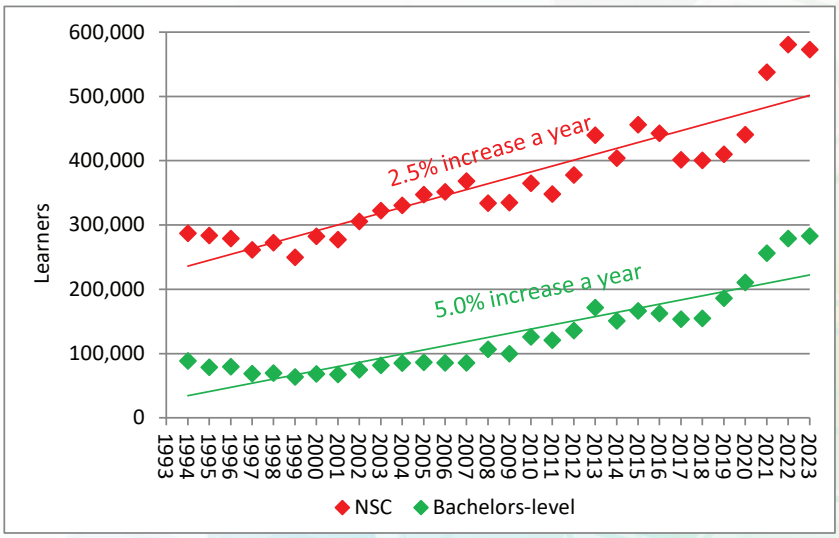
High values in Figure 22 would in part reflect the success of provincial systems in retaining learners and preparing them adequately for the Grade 12 examinations. At the same time, contextual factors would play a role. The greater proximity of TVET colleges to the homes of youths is likely to explain the lower values for the more urbanised provinces of Gauteng and Western Cape. Particularly low employment opportunities could moreover encourage learners to stay in school longer in certain provinces.

As shown in Appendix A, the ranking of the measures reflected Figure 22 differ substantially from the rankings of the widely used NSC pass rate. This underscores the importance of not focussing narrowly on this pass rate.

During the pandemic NSCs obtained increased substantially, as can be seen from Figure 23 below. It is important to understand why, and to see recent figures in the context of the longer-range trend. Year-end public NSC passes for 2021 and 2022 were 537 687 and 580 555 respectively. Taking a linear trend from 2008, when the new NSC was introduced, to 2019 produces expected passes of 447 363 and 451 998 for 2021 and 2022. This implies actual passes were 20% and 28% higher than expected for the two years. A key factor was the abovementioned relaxation of promotion requirements below Grade 12 during the pandemic, aimed at ensuring that learners did not repeat more as a result of the pandemic (see section 4.3). The unintended consequence of this was an increase in promotion rates beyond what had been seen previously. In particular, the percentage of Grade 11 learners promoted to Grade 12 increased from 67% in 2019 to 80% in 2020[73]. This was mainly due to lower repetition rates – see Figure 13 above.

73 Department of Basic Education, 2023b.

Figure 23: Year-end Grade 12 passes in the public system since 1994



Sources: Official year-end Grade 12 examination reports, with Taylor (2009) used for earlier years.

An additional factor that should be taken into account is that the pandemic years coincided with the arrival of a 2003 to 2005 births surge to age 18, meaning there was a surge in the number of youths. According to Stats SA mid-year population estimates, the number of 18-year-olds increased continually between 2019 and 2022, the increase across the three years being 9%[74]. A simulation that takes into consideration the age distribution of NSC passes suggests demographic factors alone would raise the number of NSC passes between 2019 and 2022 by 7%[75]. In Figure 24 below, the green curve is NSCs by age which could be expected in 2022 given, firstly, the general improvement in Grade 12 completion over time and, secondly, the effects of the births surge. The actual passes in 2022 (the red curve) are around 21% higher than what one might have expected on the basis of pre-pandemic data. Seen against the abovementioned 28%, the evidence suggests about a quarter of the higher-than-expected 2022 NSCs was the result of population effects, while three-quarters were due to changes in the promotion rules.

Figure 24: Age distribution of 2019 and 2022 NSC candidates

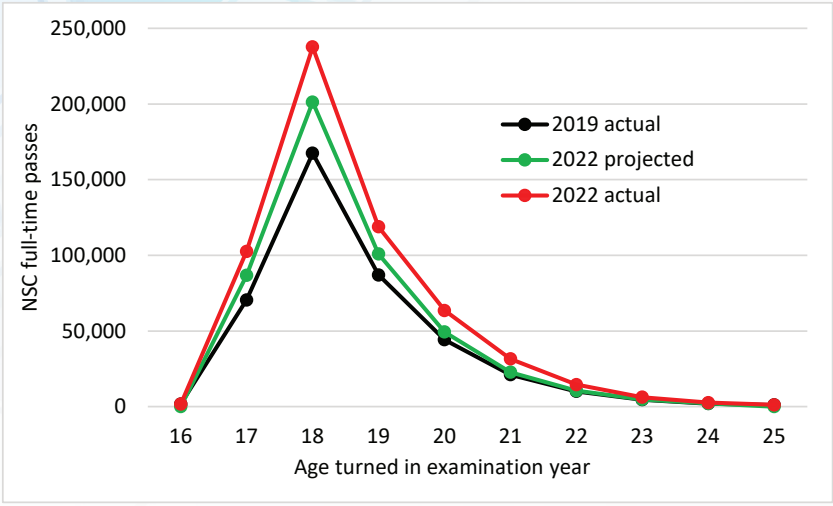


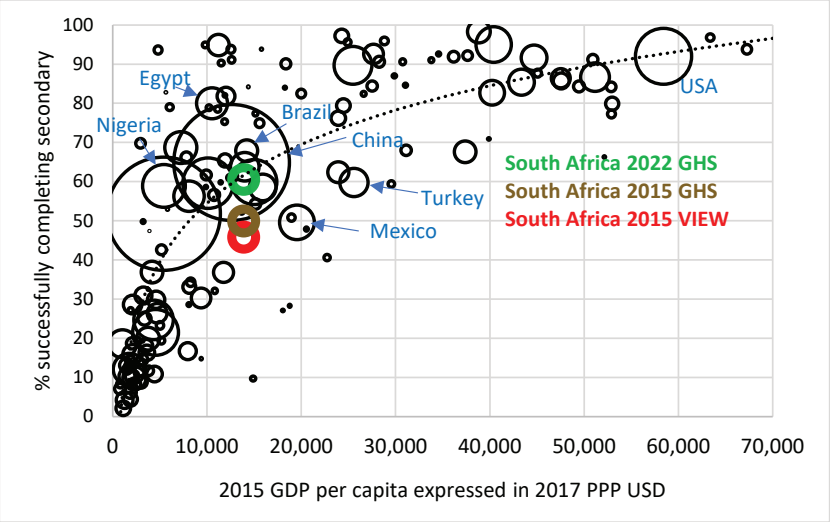
Figure 7 above indicated that in a global comparison, South Africa's participation rates at the secondary level are exceptionally high. How does South Africa compare internationally with respect to the successful completion of twelve

74 This calculation makes use of the Sprague tool Stats SA issues to convert published five-year age totals to single ages. Using registered births for earlier years produces a figure of 6%, not very different from the 7% referred to in this paragraph.

75 The gap between 7% and the aforementioned 9% is due to the fact that some learners reach Grade 12 one or more years after turning 18. Put differently, grade repetition would slow down the arrival of the births surge in Grade 12, and effectively 'flatten the curve'.

years of education? The best dataset for this covering a recent year is UNESCO's VIEW[76]. This has been used to generate Figure 25 below. Importantly, in the UNESCO dataset the approach is to measure the completion rates for youths three to five years older than the age youths should ideally be when in Grade 12[77]. This would, in the case of South Africa, mean measuring the completion rate of youths aged 21 to 23. There are two reasons why South Africa's 2015 VIEW completion rate in Figure 25 of 45.8% is relatively low. Firstly, in the case of South Africa VIEW relies heavily on the 2016 Demographic and Health Survey (DHS), which is less reliable for education statistics than the General Household Survey. Secondly, given how many South African youths complete Grade 12 at a relatively high age, the three to five year lag used by VIEW still misses many completers. Had the GHS-based approach explained for Figure 19 been used, an approach which is better at capturing late completion of twelve years of education, South Africa's 2015 value would have been 53%. The increase in South Africa's completion rate during the pandemic to 61%, using the VIEW ages rule (but with GHS data), roughly takes South Africa to the global trendline – see the green 'South Africa 2022 GHS' marker in Figure 25. During the pandemic South Africa's secondary completion rate became what one might expect, given what is seen in other countries with a similar per capita income. To illustrate, South Africa's 61% in 2022 compares with 54% in Botswana, 62% in Thailand, and 66% in both Brazil and China (the year being 2015 for these other countries). Before the pandemic, South Africa's figure was relatively low. Moreover, if youths currently completed twelve years of education a bit earlier in South Africa, the country's statistic would improve marginally: the abovementioned 61% becomes 62% (from earlier Figure 19).

Figure 25: Successful completion of secondary across the world 2015



Source: UNESCO VIEW data for completion of secondary, available at https://education-estimates.org. These data make use of household data indicating both highest level of education attained, and years of education successfully completed, meaning the completion statistics reported in the graph are likely to include TVET at the secondary level – see Dharamshi et al *(2021). The horizontal axis uses World Development Indicators statistics.*
Note: The trendline is based on a natural logarithmic function.

It is of course possible that other countries experienced surges in Grade 12 attainment during the pandemic similar to those in South Africa, which would worsen the relative standing of South Africa in 2022. The limited evidence suggests that this is unlikely to have been the case. A recent post-pandemic stocktaking of trends, including that of South Africa, points to other developing countries mostly being worse than South Africa at ensuring school participation levels did not drop during the pandemic, which in turn is likely to have affected attainment negatively in other countries[78].

76 Visualizing Indicators of Education for the World. See https://education-estimates.org. While the dataset did have values beyond 2015, 2015 was the most recent year for which a large selection of countries was available.
77 Dharamshi *et al*, 2021: 4.
78 Sabarwal *et al*, 2023: 66.

4.6 Subject specialisation in grades 10 to 12

Virtually all subjects saw increases in participating learners between 2011 and 2022, though two subjects saw declines: accounting and economics. This reflects the widely discussed decline in commercial subjects. Whether this is a problem depends in part on what subjects have gained. The largest growth was seen in history, geography and tourism.

Mathematics and physical sciences are prioritised in government's five-year plan, which sets targets for high achievers in these subjects. Participation in mathematics is clearly popular, with arguably too many learners without the necessary foundations taking the subject. The mathematics pass rate is exceptionally low: only around half of candidates obtain the minimum pass mark of 30% and only 15% reach the critical 60% mark threshold prioritised in the five-year plan. For over a decade, the percentage of learners taking mathematics, as opposed to the alternative mathematical literacy, has declined. While this is sometimes seen as a problem, it appears this trend has facilitated a focus on better performing learners, allowing the number learners with higher Grade 12 mathematics marks to increase.

Grade 9 mathematics results play a key role in informing learners about whether it is advisable for them to pursue mathematics in grades 10 to 12. Correlations between these results and subsequent Grade 12 mathematics marks point to several provinces, such as Free State, generating Grade 9 marks which would be informative for learners. However, one province, Eastern Cape, displays patterns which suggest assessment in Grade 9 is weak, making it more difficult for learners to take the right decisions.

Turning to more practical subjects, specifically those with practical assessment tasks (PATs), participation remains skewed, with black African participation being relatively low. However, the situation has been improving: black African candidates passing at least one practical subject rose from 115 000 in 2011 to 265 000 in 2022, or by 130%, exceeding increases in overall black African candidate numbers by far. Much of this reflects growth in three services-related subjects: tourism, consumer studies and hospitality studies. If similar increases in other practical subjects, in particular those relating to computing and engineering, could be realised this would broaden even further the opportunities for black African school-leavers.

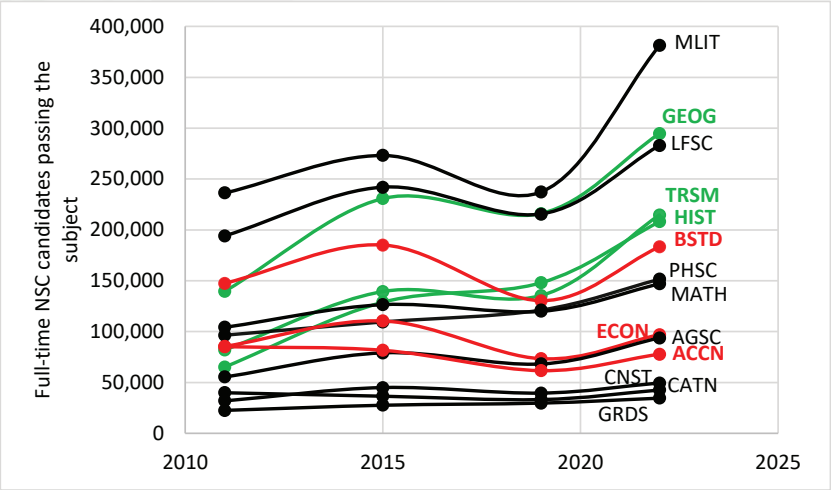
A noteworthy trend is KwaZulu-Natal's large expansion in access, particularly among black African learners, to the practical subject of dramatic arts. By 2022 the percentage of Grade 12 learners in a school offering this subject had risen to 26%, by far the highest figure among all provinces.

The year-end National Senior Certificate (NSC) full-time candidate results provide a reliable basis for examining what learners in grades 10 to 12 are specialising in[79]. In 2022, NSC candidates sat for 44 non-language subjects, with the largest 14 of these subjects accounting for more than 96% of the final marks for non-language subjects. The number of candidates obtaining at least 30%, the minimum pass mark, in these 14 subjects, regardless of whether they had enough credits to obtain the NSC, is illustrated in Figure 26 below. The increases seen in the graph should be understood in the context of considerable increases in the number of full-time candidates sitting for the examinations: around 510 000 in 2011, 610 000 in 2019, and 745 000 in 2022[80]. The growth in the overall number of candidates is, at the subject level, reflected strongly in greater participation in geography, history and tourism. These three subjects, represented by green curves in the graph, saw the largest increase in the percentage of candidates passing them. Three subjects saw a noteworthy decline in the percentage of candidates passing in them (but also participating in them): business studies, economics and accounting (red curves). Of these three, economics and accounting experienced trends representing an absolute decline in the numbers. These are manifestations of the widely discussed decline in participation in commercial subjects. Whether this is a problem is a matter for debate, and depends in part on which other subjects have gained prominence in their place.

79 In this section, unless otherwise stated, statistics reflect full-time candidates across all schools taking the public examinations. In 2022, 5% of candidates were from independent schools.

80 These values reflect any candidate in the year-end examinations data classified as full-time. Discrepancies between these values and number of candidates writing in the official reports are largely due to different dates of extraction of the data and, in the case of 2019, the way MEO (multiple examination opportunity) candidates were counted for the official report.

Figure 26: Passes in larger non-language subjects 2011 to 2022



Source: Analysis of NSC microdata for the years 2011, 2015, 2019 and 2022.
Note: Green signifies an overall annual increase in the percentage (not absolute number) of candidates passing the subject, based on a slope, that exceeds 0.4 percentage points a year, or 4.4 percentage points for the entire 2011 to 2022 period. Red means a decline exceeding 0.4 percentage points a year.

One noteworthy phenomenon is an increase in the percentage of full-time candidates taking more than that the standard number of seven subjects: between 2015 and 2023 this increased from 4% of candidates to 12% of candidates. In virtually all cases, this was a matter of candidates taking eight subjects. The explanation generally given is that an eighth subject reduces the risk of not qualifying for the NSC, even if this clearly increases the studying a learner must put in prior to the examinations. As shown in Appendix A, the upward trend was driven largely by Mpumalanga and KwaZulu-Natal.

The fact that history participation and passes have grown more than for any other subject, with passes more than tripling between 2011 and 2022 in Figure 26, should be seen in the context of a strong emphasis on increasing an awareness of history among young South Africans, in the interests of building greater social cohesion. The Ministerial Task Team report of 2018 in this regard is noteworthy[81]. What is also likely to have influenced growth in history is the fact that it is seen as relatively easy: in the 2011 to 2022 period it has mostly been the subject with the fifth-highest pass rate (passes over all those sitting for the subject examination) among the 14 large subjects, with only tourism and the relatively small subjects computer applications technology, consumer studies and engineering graphics and design displaying[82] displaying higher values. With respect to social cohesion effects, it is noteworthy that white candidates are particularly unlikely to take history – only 11% of white candidates did this in 2022, with similar figures for earlier years since 2011, compared to a 2022 figure of 32% for black African candidates.

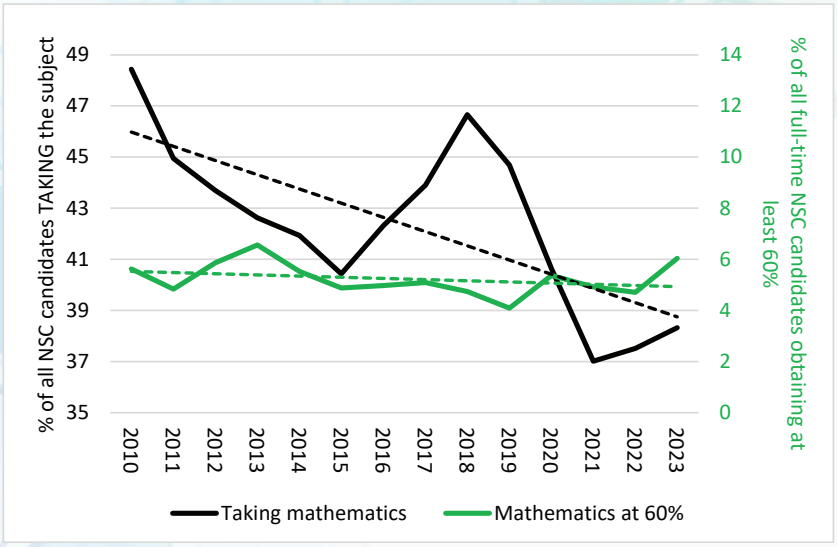
Two key subjects are mathematics and physical sciences, both specifically prioritised in the 2019 to 2024 Medum Term Strategic Framework (MTSF), and both commonly used by universities to gauge readiness for certain fields of study. Figure 26 under-states the presence of mathematics in Grade 12. In 2022 mathematics was the third most taken non-language subject after life sciences and geography (this is if one ignores mathematical literacy, the most taken subject, and a compulsory subject if mathematics is not taken). In 2022, around 270 000 full-time candidates took mathematics. However, this subject also displays the lowest pass rate – just 54% in 2022 – resulting in the low ranking of mathematics passes seen in Figure 26. In terms of population groups, relatively low mathematics participation among coloured candidates writing the examinations stands out: in 2022 18% of coloured candidates took mathematics, far lower than the 37% for black African, 46% for white and 53% for Indian. Participation rates for male and female candidates in 2022 were 33% and 39% respectively, but with mathematics pass rates being higher for males. The percentage of all full-time

81 Ndlovu *et al*, 2018.
82 CATN, CNST and GRDS in Figure 23.

candidates (whether taking mathematics or not) getting to pass mathematics at a mark of 30 was similar for the two sexes: 20% for females and 19% for males. Put differently, females were more likely than males to take mathematics, even if not ready to pass the subject.

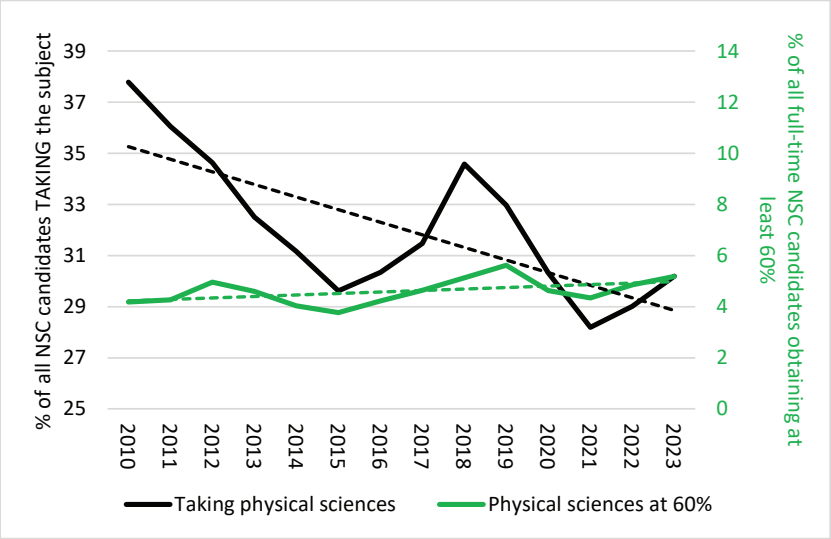
A critical and somewhat confusing question is the relationship between participation levels in mathematics, as opposed to mathematical literacy, and mathematics outcomes. It is sometimes assumed that having more learners take mathematics will result in more youth ready for mathematically-oriented programmes at university. The problem, described above, of around half of mathematics candidates not passing mathematics at the minimum 30 mark level needs to be taken into account. As shown in Figure 27 below, the decline in participation in mathematics, something which is often referred to as a problem, has over the years not been associated with a commensurate decline in the percentage of NSC candidates (not just mathematics candidates) obtaining a high mathematics mark, in this case 60%, a threshold prioritised in the MTSF. In fact, it is very likely that the percentage of candidates who excelled in mathematics in mathematics increased, as was the case for physical sciences – see Figure 28, which focusses on physical sciences. The likelihood of more difficult mathematics examination papers is discussed in section 5.2 below. At the provincial level, interesting patterns suggest that reducing participation levels in mathematics is generally associated with an increase in the percentage of all candidates obtaining high-level marks (see Appendix A). This would be consistent with the notion that too many academically weak learners in the mathematics class reduce opportunities for academically strong learners.

Figure 27: Participation and high-level achievement in mathematics



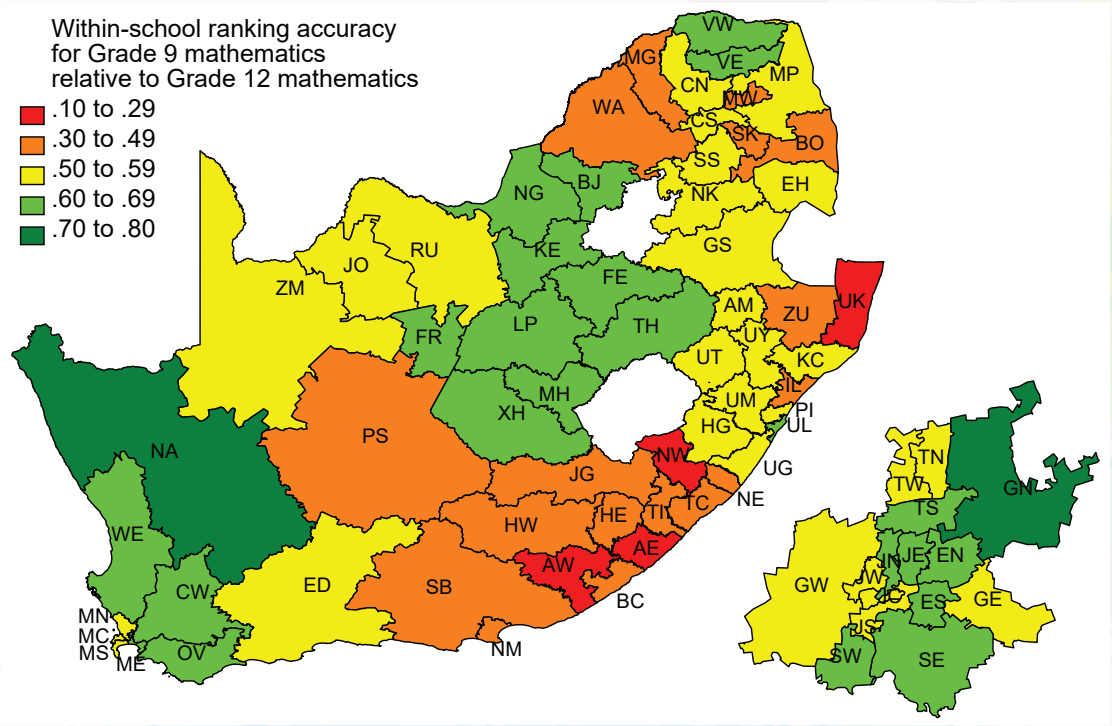
Note: In this graph and the following one, green curves should be read against the right-hand axis. Dotted lines are linear trendlines.

Figure 28: Participation and high-level achievement in physical sciences



The subject choices in Grade 10 are influenced by marks obtained at the end of Grade 9. These are school based assessment marks with only limited external moderation. If Grade 9 marks do not offer sufficiently reliable signals to each learner, the risk increases that learners will make poor decisions when choosing subjects. Figure 29 below provides a picture of how well Grade 9 mathematics marks at the end of 2018 correlated with mathematics marks in the Grade 12 examinations of 2021 within each school. The higher the correlation, the greater the chances that assessment in Grade 9 was sufficiently reliable to guide learners into the right subjects, in this instance mathematics as opposed to mathematical literacy. Correlation coefficients were calculated at the level of the school, as the aim was to examine the integrity of assessments within the school, not the comparability of Grade 9 results across schools. The district averages across the school-level correlation values are shown in the map. Correlations of 0.60 and above reflect relatively good Grade 9 assessment practices. At the provincial level, average correlations of at least 0.60 are found in four provinces: Free State, North West, Gauteng and Western Cape. As seen in the map, in Free State all five districts display values of at least 0.60. The map suggests the other five provinces should pay special attention to strengthening the integrity of assessments in Grade 9. This is especially so in Eastern Cape, where for the province the correlation is an exceptionally low 0.37.

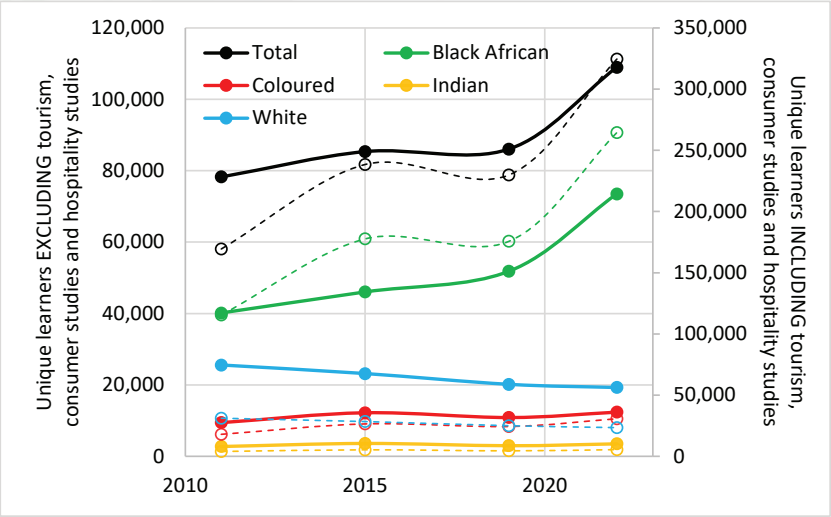
Figure 29: Grade 9 mathematics ranking accuracy by district



Note: This map draws from 589,704 learners across 5,687 public ordinary schools. Schools were not weighted by learners for this analysis. Only learners in the same school in 2018 and 2021 were included in the analysis. Learners taking mathematical literacy in the 2021 examinations were excluded from the analysis.

The MTSF, in dealing with Grade 12 outcomes, makes special mention of the following intervention: 'Increase access among historically disadvantaged learners to "niche" subjects such as those focusing on engineering and computing'. While there is no explicit definition of these subjects, roughly they can be said to correspond to the 24 non-language subjects, out of a total of 44 non-language subjects in 2022, requiring a practical assessment task, or PAT. These subjects tend to be more practical, and less theoretical, and often imply additional costs associated with smaller classes, special teaching materials, or more intensive forms of assessment. The 24 subjects with PATs accounted for 9% of all the final marks in non-language subjects in 2022, or 4% if three relatively large subjects in the organising field 'Services' are excluded, these being tourism, consumer studies and hospitality studies. Figure 30 shows trends for passes at 30% with and without the three services subjects. Learners are counted once only, so a learner passing two of the 21 (or 24) subjects would be counted just once on the vertical axis. If the three services subjects are counted, meaning there are 24 subjects in total, the average number of PAT subject passes per learner across the 324 449 candidates taking some PAT subject in 2022 is 1,4. With the three services subjects excluded, the number of learners drops to 108 951, and PAT subjects per learner becomes 1,6. Outside of the three services subjects, the largest subject with a PAT is computer applications technology (5,7% of all 744 470 NSC candidates passed this subject in 2022), followed by engineering graphics and design (4,7%), dramatic arts (2,5%), technical sciences (1,9%) and technical mathematics (1,6%) The last two subjects were introduced in Grade 12 in 2018 for the first time as part the broader effort to provide learners with more vocational specialisations.

Figure 30: Growth in 'niche' practical subject passes



Note: Dotted lines refer to counts where the three subjects tourism, consumer studies and hospitality studies are included. These curves should be read against the right-hand vertical axis.

Black learners remain at a disadvantage in terms of participation in 'niche' subjects, but the inequalities have been reduced. Focussing just on black African examination candidates, the number of full-time candidates in general increased by 53% between 2011 and 2022, while candidates passing at least one subject with a PAT increased by a higher margin of 130% (three services subjects included)[83] or 83% (services subjects excluded). These percentages draw from the absolute numbers of Figure 30[84]. Yet by 2022 serious inequalities remained: if the three services subjects are excluded, the percentage of candidates passing any PAT subject was 11% for black African, against 26%, 31% and 68% for coloured, Indian and white (if the services subjects are included, the figures are 40% for black African and 67% for the other three groups combined).

While the number of public ordinary schools offering the NSC increased from 5 995 to 6 480 between 2011 and 2022, an increase of 8%, the number of these schools offering any subject with PATs increased from 3 452 to 4 028, or by 17%. Slower progress was seen with respect to the number of public ordinary schools offering non-services PAT subjects, the number of schools increasing from 1 901 to 1 972, an increase of just 4%, less that the overall growth in schools. Subjects with PATs thus became more widely available across the system, though this was driven largely by the three services subjects. The percentage of black African candidates in public ordinary schools offering at least one PAT subject increased slightly from 67% to 70% between 2011 and 2022, but remained at around 34% if the services subjects are excluded – this last statistic was 77% for coloured and 97% for white and Indian combined in 2022. While expanded access to the services subjects for black learners is an important achievement, a key challenge is to ensure that more schools provide access to the other PAT subjects too, which often represent particularly scarce skills in the labour market, such as in the computer- and engineering-related fields.

Similar challenges exist with respect subjects in the creative arts field of learning, which all have PATs: dance studies; design; dramatic arts; music; and visual arts. Though the number of black African candidates passing at least one creative arts subject increased substantially, from 6 736 in 2011 to 21 779 in 2022, the 2022 value as a percentage of all black African candidates remained just 3% (against 5%, 8% and 13% for coloured, Indian and white respectively). Much of the credit for the improvement which has occurred must go to KwaZulu-Natal and the subject dramatic arts. In KwaZulu-Natal, between 2011 and 2022 the percentage of Grade 12 learners in the province in a school offering dramatic arts rose from 14% to 26%, with the 26% figure being easily the highest among the provinces. Moreover, in recent years over 90% of KwaZulu-Natal's dramatic arts candidates have been black African.

83 The underlying values from Figure 27 are 115 511 in 2011 and 264 466 in 2022.
84 The decline for whites seen in the graph is roughly in line with the decline in the overall number of white candidates.

Turning to languages, there was little change between 2011 and 2022. The percentage of all candidates taking English home language remained around 17%, and 12% if just black African learners are considered. Of all candidates, 75% took one of the nine African languages as a home language, while 8% took Afrikaans home language. The percentage of candidates taking an African language as a first additional language is low, at 3% in 2022. This figure is a much lower 0,8% if only white, Indian or coloured candidates are considered, though that was even lower at 0,3% for these candidates in 2011. Taking a second additional language is fairly rare, accounting for 3% of candidates in 2022 – this statistic becomes 0,03% if only the nine African languages are considered[85].

4.7 Attainment, post-school education and the labour market

The importance of skills acquired at school is highlighted by the fact that around 60% of young South Africans who are in the labour market experienced no formal education beyond school. Moreover, only 18% of young South Africans obtain a post-school qualification. These statistics should improve and are improving, yet for many years school will remain virtually the only education received by many young people.

Though women are in a small majority among the employed population up to age 35 with a post-school qualification, among those with only Grade 12, or less than this, women are clearly less likely to be employed. This suggests there is scope for better ways of preparing female learners, within schools, for the world of work. With regard to learners who proceed to some form of post-school education, there is a clear need to prepare more black African learners for this route. Even if most learners do not get to experience post-school studies currently, in many ways the strong focus in the schooling sector on preparing learners for such studies is justified. The post-school sector remains too small and undynamic, a reason why South Africa continues to suffer from skills shortfalls in critical areas, according to the Department of Higher Education and Training's Labour Market Intelligence (LMI) programme. This problem slows down economic growth and hence employment opportunities for the entire spectrum of school leavers.

It is vital for education planning to be informed by recent patterns in the interface between the education system and the labour market. Figure 31 below provides a picture based on 2021 and 2022 General Household Survey (GHS) data. At age 14, almost everyone is in an education institution, hence there is almost no labour market participation at this age. But as age increases, participation increases, with less than half of the population still in the education system from age 19 onwards. If age 30 is considered, then 42% of the population have successfully completed only Grade 11 or less, another 42% have Grade 12 (which could be something equivalent from a college), 11% have a qualification from some post-school institution that is not a university, while the remaining 4% have a university qualification.

In considering who is in education, Figure 31 does not count individuals pursuing distance studies. Of those outside of any physical educational attendance (the white wedges of the graph), 4% were engaged in some distance education. The figures were 3% for the employed, and 5% for the unemployed[86].

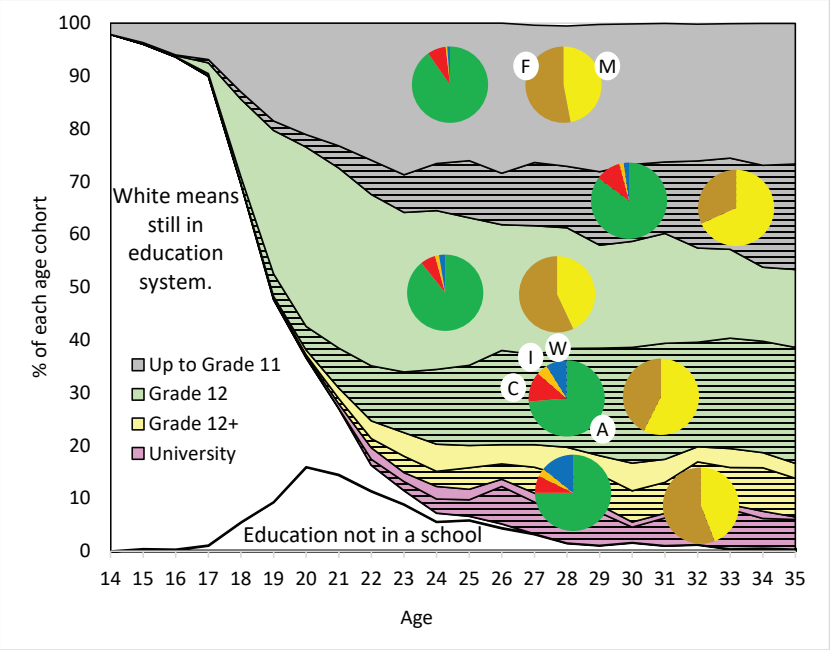
The chances of employment clearly rise with level of education. The employed are indicated by horizontal lines in the graph. The percentage of people aged 30 employed across the four groups represented in the graph is as follows: 35% for up to Grade 11; 52% for Grade 12; 53% for 'Grade 12+'; and 76% for university graduates. These percentage employed statistics represent the percentage of anyone not in education who is employed. This concept is different from the employment rate, which is the percentage of those available to work who are employed. To illustrate, some of the non-employed illustrated in the graph would be engaged in caring for their own children at home which, while clearly work, is not considered employment.

The widely quoted NEET category, meaning 'not in employment or education or training', would include those not looking for work currently, such as these individuals engaged in childcare. At age 30, 49% of youths are NEET, with this dropping a bit to 45% by age 35.

85 Put differently, only 218 candidates took one of the nine African languages as a second additional language in 2022. Of these 218, 184 were black African.

86 See also discussion of correspondence studies in section 4.2.

Figure 31: NEETs by age and highest education



Source: Pooled GHS microdata from 2021 and 2022, with each year weighted equally.
Note: Wedges with horizontal lines are the employed, using the derived GHS employed variable. 'Grade 12+' is any qualification not falling into the other three categories. This includes ten values, with the value 'DIPLOMA WITH GRADE 12/STANDARD 10/OCCUPATIONAL CERTIFICATE – NQF LEVEL 6' accounting for around half of the 'Grade 12+' category. Race pie charts use green for black African, red for coloured, orange for Indian and blue for white. Gender pie charts use yellow for male, brown for female. Pie charts describe the large top four wedges separately, and the combination of the bottom four wedges.

While the percentage employed among those who have only a Grade 11 or something less is low, at 35%, it is clearly not true that youths with a Grade 12 are always preferred above those with less than Grade 12 as employees in the labour market. Moreover, at age 30 the number of youths with Grade 11 or less who are working is 30% higher than the number of youths with a 'Grade 12+' or university qualification who are working. And 32% of the employed represented in Figure 31 are from the 'Up to Grade 11' group. These figures serve as a reminder of the fact that the schooling system plays a crucial role in directly preparing the least advantaged in society for the world of work.

There are important gender patterns. Among the less educated, with Grade 11 or less, those who find employment tend to be males. Among the more educated, with some post-school education, there are slightly more females than males. If just the employed in this more educated group are considered, females are also in the majority, but by a small margin.

Much of the emphasis in the schooling system is on preparing youths for further education in some post-school sector. The percentage of youths who take this route has in the recent past remained relatively low: based on Figure 31 only 18% of adults aged 31 to 35 successfully completed some post-school education. A strong policy emphasis here is justified by the fact that South Africa suffers from not just very high unemployment, but also critical skills shortages, something which slows down economic growth, and worsens the unemployment situation. Details in this regard are explained in an important 2022 report emerging from the Department of Higher Education and Training's Labour Market Intelligence (LMI) programme[87]. The post-school system should be producing more graduates overall – South Africa's statistics in this regard are poor in an international comparison, even if there have been improvements[88] – and should focus especially on skills in short supply in the labour market. The schooling sector can assist in this by ensuring that

87 Kuluvhe *et al*, 2022: 19.
88 Van der Berg *et al*, 2020: x.

more learners leave school with the skills required by post-school institutions.

A statistic of interest in the percentage of youths who do not access any education outside school. The higher this statistic, the greater the relative role of schools in preparing youths for the world of work. No national survey asks youths which education institutions they have ever attended, as opposed to which institution they currently attend. However, a rough estimate of the percentage of youths who have ever attended any post-school institution, regardless of whether they obtained a qualification from the institution, can be found using the available statistics. The figure is around 60% by age 30. Put differently, in recent years by age 30 only around 40% of South Africans had experienced formal education outside a school[89]. This statistic should rise, but also it points to the vital role played by schools currently and in the foreseeable future in preparing young people for the world of work.

5. The quality of learning outcomes

5.1 Evidence from international assessments

Clear evidence of improvements with respect to South Africa's learning outcomes, since around 2002, can be seen in the results of the three international assessment programmes South Africa has participated in: TIMSS, PIRLS and SACMEQ. Improvements have been steeper than in other countries, meaning gaps between South Africa and other similar developing countries have been closing. By 2019, South Africa was still a relatively weak performer in, for instance, lower secondary mathematics, but far less so than 20 years previously.

South Africa's achievements are acknowledged in the 2024 issue of McKinsey's report on education around the world. In that report South Africa is put forward as an example of good practices and identified as one of seven 'sustained and outsized improvers' in the world.

If past speeds of improvement are sustained, South Africa's educational quality could by 2030 be roughly on a par with that seen in Malaysia today.

However, continued steep improvements cannot be taken for granted. One of the three assessment programmes pointed to a plateauing of the trend immediately before the pandemic, and the pandemic itself has inflicted a serious and negative dent in the learning trends of all countries. The available evidence points to South Africa's pandemic-related school disruptions and learning losses being roughly similar to the world average. Reliable measurement of learning proficiency trends must continue, and should guide the policy discourse on where to concentrate efforts to sustain progress in future.

The 2024 McKinsey report on education identifies South Africa as one of seven countries from around the world which can be considered a 'sustained and outsized improvers', based on results in international assessments over the 15 years from 2005 to 2020[90]. The six other countries are: Singapore, Estonia, Poland, Norway, Peru and Morocco. In the case of South Africa, TIMSS[91] Grade 9 improvements in mathematics and science between 2011 and 2019 were

89 This 40% is high relative to the height of the wedge 'Education not in a school' in Figure 28 because not everyone who experiences some post-school education does so at the same age, and not everyone completes their post-school education. The 40% estimate was obtained by dividing first-year post-school participation numbers in some recent year by a birth cohort size of 950 000. The 380 000 number of first-year students is made up of around 150 000 public college students, 160 000 public university students, and an estimated 70 000 private students (mostly in colleges). It should be underlined that the 40% figure is a rough estimate, and that panel data would be needed to gain more certainty around this value. The 40% figure is likely to be an over-estimate insofar as there would be double-counting: some youths enter a college as a first-year student, and then subsequently enter a university as a first-year student. The 40% does not take into account an estimated 80 000 youths aged 15 to 30 who enter a community education and training college for the first time each year, mainly to pursue studies that would also be offered in a school. An indeterminate number of these 80 000 would already have been counted among the first-year students of other post-school institutions.

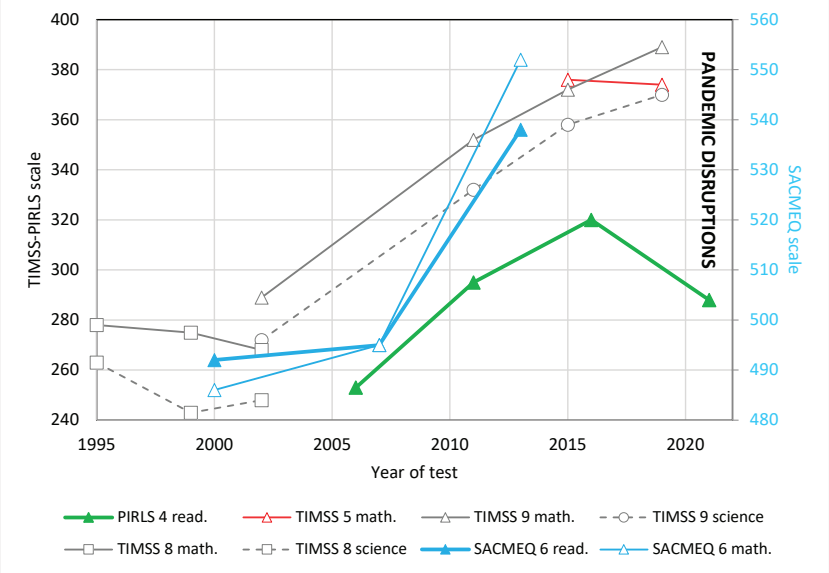
90 McKinsey & Company, 2024: 14.

91 Trends in International Mathematics and Science Study.

considered, as well improvements in PIRLS[92] Grade 4 reading between 2006 and 2016[93].

Beyond the statistics considered by McKinsey, several other statistics from the international assessment programmes confirm South Africa's trend of sharp improvements in learning. Figure 32 lays out this broader picture, which includes SACMEQ[94] results. Details regarding the trends in the three programmes – TIMSS, PIRLS and SACMEQ – up to 2016 are provided in *Action Plan to 2024*[95]. Virtually all trends beginning in 2002 or later, and not coinciding with the pandemic, display steep improvements.

Figure 32: South Africa's improvements in three international testing programmes



Sources: Published TIMSS, PIRLS and SACMEQ reports. The SACMEQ 2013 values in the graph, from Department of Basic Education (2017c), should not be confused with different and incorrect preliminary results circulated in 2016. The PIRLS 2011 score is the re-calculated score explained in IEA (2021), also in Van Staden and Gustafsson (2023).

Figure 33 below illustrates South Africa's (ZAF) lower secondary TIMSS mathematics trends, trends that inform McKinsey's conclusions, plus those of other developing countries. There has clearly been a 'catch-up' process since 2002. By 2019, South Africa was on a par with a few countries that were well ahead of South Africa in around 2002, in particular Botswana (BWA), Saudi Arabia (SAU) and Morocco (MAR). However, the fact that South Africa (and Botswana) have in recent years tested Grade 9, while all other countries have tested Grade 8, means the relative position of these two countries is somewhat over-stated – the extent of this can be seen by comparing South Africa's Grade 8 and Grade 9 results in 2002. Yet the countries in the graph are comparable in the sense that all results reflect the second year of secondary schooling – all countries except for South Africa and Botswana have only six grades at the primary level. An important consideration is the extent to which learners drop out of school before the TIMSS testing occurs. More dropping out would tend to inflate the scores. Roughly, survival to the end of lower secondary is similar across the countries seen in the graph. For example, between 85% and 90% of young people survive to the end of lower

92 Progress in International Reading Literacy Study.

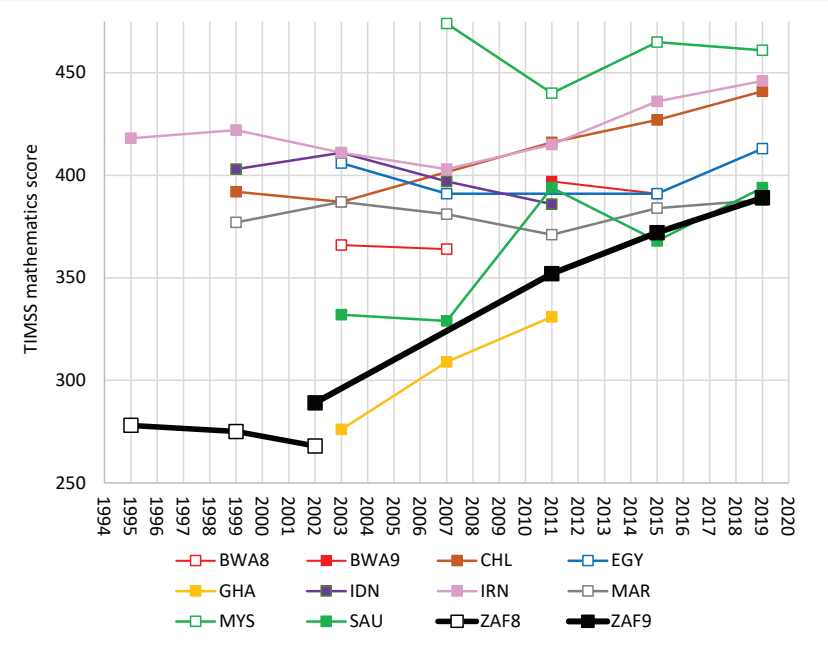
93 McKinsey & Company, 2024: 103. While the McKinsey report includes an acknowledgement of South Africa's improvements in PIRLS, it is not clear what original PIRLS values were used when translating to PISA points. Ideally, the Grade 4 results of 2006 seen in Howie *et al* (2008: 19) and the 2016 Grade 4 results seen in the official international PIRLS reports would have been used (as in Figure 29 in the current report), with the revised 2011 Grade 4 score used to confirm the trend. However, this 2006 PIRLS result has not been published in the international reports. The same applies to the revised 2011 score (see Department of Basic Education, 2020a: 133).

94 Southern and Eastern Africa Consortium for Monitoring Educational Quality.

95 Department of Basic Education, 2020a.

secondary schooling in South Africa, Egypt, Iran and Malaysia[96].

Figure 33: TIMSS mathematics at the lower secondary level



Source: International TIMSS reports, but Reddy et al *(2012) for the South Africa 2002 Grade 9 value.*
Note: South Africa (ZAF) and Botswana (BWA) both switched from testing Grade 8 to testing Grade 9.

In Appendix A, Figure 67 illustrates the rankings of South Africa's provinces over time with respect to the international assessments. On the whole, provincial rankings have not changed much. Western Cape and Gauteng have consistently emerged as strong provinces, while Eastern Cape and Limpopo have tended to perform worst. This is not simply a reflection of the effectiveness of specific provincial administrations. It has been repeatedly demonstrated[97] that there is a clear correlation between each province's poverty levels, and schooling outcomes. Each province's ranking is strongly influenced by its level of poverty.

Figure 34 below illustrates the distribution of TIMSS lower secondary mathematics scores in 2019 across several countries, and the percentage of learners obtaining at least the 400 score corresponding to the 'low international benchmark'[98]. What is noteworthy is the shape of each country's curve to the left of the 400 threshold. Countries with a bulge of learners just below the threshold, or in the 'pipeline', such as South Africa or Morocco can expect future improvements in the mean score to translate to particularly good gains when it comes to the percentage of learners passing the 400 threshold.

96 From the UNESCO VIEW data discussed in relation to earlier Figure 22.
97 See for instance Department of Basic Education (2020a: 90).
98 While in the case of PIRLS reading the low international benchmark is considered sufficient for the SDG indicators, for mathematics (at the primary or secondary level) the higher 'intermediate benchmark' is considered necessary – this corresponds to 475 TIMSS points. This is clear from metadata appearing in the UIS SDG portal at http://sdg4-data.uis.unesco.org.

Figure 34: TIMSS lower secondary mathematics distributions in 2019

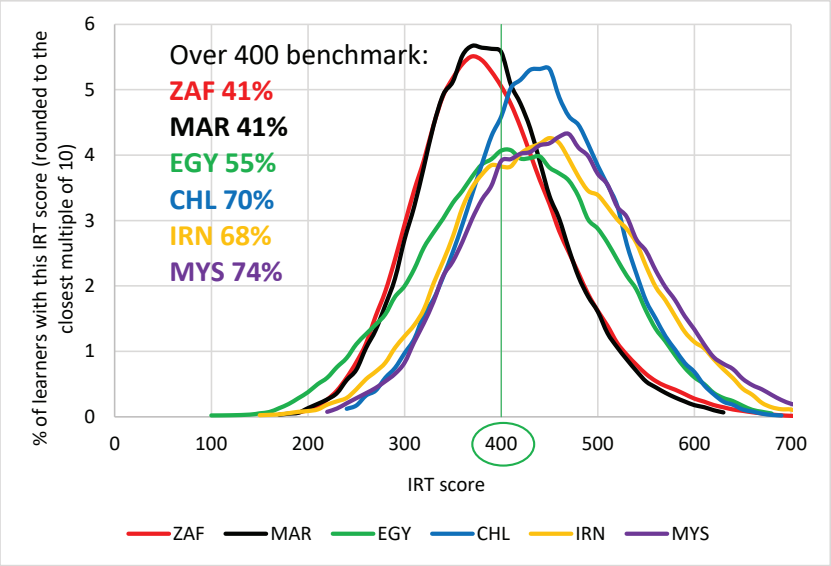
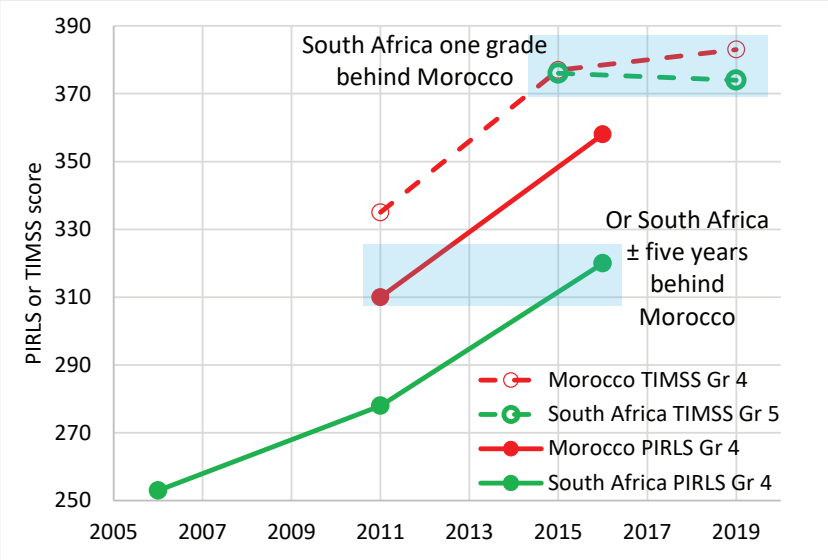


Figure 35 below provides another angle on South Africa's relative trends and levels. Morocco is an interesting country to compare South Africa to as it is the country displaying patterns closest to those of South Africa. Both countries have historically displayed relatively low levels of learning, but both are also relatively fast improvers. Figure 35 focusses on the primary level, where TIMSS results point to South Africa being a grade behind Morocco, while PIRLS results point to South Africa being five years behind South Africa. Within the global context South Africa needs to do even more catching up, beyond the catching up that has already occurred. Yet the extent to which South Africa is behind is not as worrying as is sometimes portrayed in the public media.

Figure 35: South Africa and Morocco pre-pandemic primary trends compared



Sources: Relevant TIMSS and PIRLS reports available at timssandpirls.bc.edu. See also notes to earlier Figure 33.
Note: South Africa performs TIMSS testing one grade higher than is the norm in TIMSS (Grade 5, not Grade 4).

Yet another way of viewing South Africa's trends is to consider improvements in terms of a fraction of South Africa's standard deviation in each assessment programme. This is one way of standardising improvements and dealing with the fact that, say, a 30-point improvement in SACMEQ is not the same as a 30-point improvement in TIMSS. South Africa's improvements across the three abovementioned programmes have been between 0,05 and 0,09 standard deviations a year[99]. Improvements steeper than this are essentially not found in recent times across the world, implying that there is

99 Department of Basic Education, 2020a: 33.

in a sense a 'speed limit' relating to how change happens[100]. Targets in the five-year plans of government[101] have been informed by this and are thus realistic, while ambitious.

Though progress may seem slow, estimates of where South Africa could be in the medium term are promising. For instance, South Africa's TIMSS Grade 9 trends suggest that if historical improvements are sustained, the country could by around 2030 be on a par with current levels of educational quality in Grade 8 in Malaysia[102]. While this would still not put South Africa on a par with Malaysia's Grade 9, which would carry a higher score than Grade 8 if measured, it is worth noting that Grade 9 in South Africa and Grade 8 in Malaysia are both the second year of secondary schooling.

One pre-pandemic trend for South Africa was not clearly upward, and that was the Grade 5 mathematics trend in TIMSS between 2015 and 2019. Instead, the trend was essentially flat – see Figure 32 above. The relevant TIMSS microdata have been examined, and it seems clear that the two samples for 2015 and 2019 are comparable, and that the lack of progress is reflected across all common items[103]. Put differently, there appears to be no reason to doubt the finding that there was no progress. Further research is needed into the possible reasons for this, but it has been speculated that rising class sizes could be an important factor – see section 4.4.

As in all countries, the COVID-19 pandemic had a devastating effect on learning in South Africa. Comparing losses in school days across countries during the pandemic is complex, yet the available evidence points to South Africa's losses in contact time being slightly below the global average: 5,0 months against an average of 5,9 months. Moreover, while several other middle income countries experienced a surge in dropping out from school as a result of the pandemic, this was not the case in South Africa (this was discussed in section 4.5). Moreover, South Africa's learning losses expressed as months of learning lost have been estimated to be very slightly below the global average[104].

Unfortunately, PIRLS 2016 to 2021 trends have been taken at face value in arriving at the conclusion that South Africa's learning losses in Grade 4 reading were exceptionally serious, and the worst for all PIRLS countries. This conclusion ignores the warning provided in the 2021 international PIRLS report itself to avoid this type of comparison, given how PIRLS 2021 testing was implemented. Specifically, the interruptions of the pandemic meant different countries pursued unusual sampling strategies with respect to the grade tested, the point in the year when testing occurred, and the months which had lapsed since March 2020, the start of the pandemic. The international PIRLS report's warning runs as follows[105]:

The considerable variation in the extent and response to the pandemic within and across countries makes it impossible to estimate the magnitude of a COVID-19 effect uniformly across countries or country by country at this time. It is more defensible to use ancillary national, regional, and local data to study the impact of the pandemic on student achievement within a country.

The 2023 TIMSS results, when released, will provide perhaps the best picture to date of the impact of the pandemic on South Africa's educational quality in an international context. This is because testing in 2023 would not have been disrupted and rearranged as a result of the pandemic, in the manner of the 2021 PIRLS testing.

Turning to reporting on learning outcomes for the Sustainable Development Goals (SDGs), this has been problematic globally due to data quality and data coverage concerns. While 94% of the world's children are in countries where some statistics relating to SDG 4.1.1, the indicator dealing with learning outcomes, exist, only half are in countries with enough statistics to gauge progress over time[106]. In April 2024, the official UNESCO Institute for Statistics reporting system[107] had values for the four primary-level indicators in the case of South Africa: reading and mathematics for each of the 'Grade

100 UNESCO Institute for Statistics, 2019.
101 Department of Planning, Monitoring and Evaluation, 2021.
102 Department of Basic Education, 2024a: 12.
103 Gustafsson, 2024.
104 Sabarwal *et* al, 2023: 66, 68.
105 Mullis *et al*, 2023: 32-33.
106 UNESCO Institute for Statistics, 2023.
107 http://sdg4-data.uis.unesco.org.

2 or 3' and 'end of primary' levels. For 'Grade 2 or 3' PIRLS and TIMSS results were used, the most recent statistics for learners with a 'sufficient proficiency level' being 19% and 16% for reading and mathematics respectively[108]. For 'end of primary' the most recent statistics are 30% and 57% for reading and mathematics, and this draws from SACMEQ 2013 results. The 'end of lower secondary' level has no statistics for South Africa, presumably because South Africa tests Grade 9 and not Grade 8 in TIMSS.

5.2 Excellence in the National Senior Certificate results

This section focusses on NSC results that qualify and prepare learners for university studies. Four patterns stand out.

Firstly, the number of school-leavers who qualify to study at a university has increased dramatically. In 1994, around 100 000 Grade 12 learners obtained a certificate that permitted entry into a bachelors programme at a university, against 280 000 in 2023. If NSC graduates qualifying to study for a three-year diploma at a university are included, the 2023 figure rises to 470 000. This is considerably higher than the annual first-year intake by universities of around 180 000.

Secondly, the number of learners achieving a mark of at least 60% in mathematics or physical sciences has increased between 2016 and 2024, for instance from around 32 000 to 41 000 in mathematics. In this regard, key government targets have been met.

Thirdly, a comparison of high-level mathematics and physical sciences results in Grade 12 to the subject-specific admission requirements faced by first-year students at university illustrates that further improvements are urgently needed. Importantly, around two-thirds of first-year students are subject to requirements relating to these two subjects. The statistics point to a small under-supply of these skills by schools, when there should be a substantial over-supply to ensure students cope at university.

Fourthly, it is important to learn from exemplary districts and schools, and to understand that where these are may be surprising. Notably, rural districts tend to fare better than urban districts in ensuring that black learners remain in school to Grade 12 and achieve high mathematics marks.

Section 4.5 above dealt with the extent to which learners 'survive' to successful completion of twelve years of education and achieve the National Senior Certificate (NSC), or some equivalent qualification from a college. Section 4.6 dealt with trends relating to subject participation in the Grade 12 examinations. Here the achievement of NSC results that qualify and prepare learners for university studies receives attention.

The number and percentage of youths who formally qualify for entry into a university in terms of their NSC status has increased dramatically. Youths qualifying annually for entry into a bachelor's programme at a university has increased from around 100 000 in 1994, to just over 280 000 in 2023. The Medium Term Strategic Framework (MTSF) target of 190 000 by 2024 has thus been exceeded by a wide margin. By far most of the increase is from schools serving poorer communities. If NSC graduates qualifying to study for a three-year diploma at a university are also counted, then the number of youths qualifying for entry into a university following the 2023 year-end examinations was around 470 000[109]. Given that universities are only taking in around 180 000 new first-year students each year, of which around 100 000 pursue Bachelors-level studies, there are clearly more qualifying learners emerging from schools than universities can absorb.

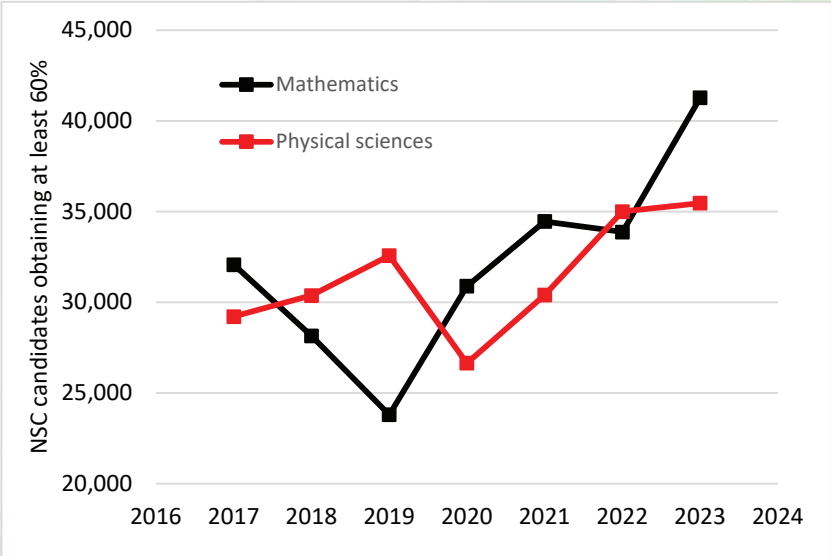
The challenge with respect to the university-readiness of NSC graduates relates less to the overall status of each learner's NSC, and more to results in specific subjects, especially mathematics and physical sciences. Minimum marks in one or both of these subjects are applicable to around two-thirds of first-year university students.

108 The years would be 2021 and 2019 for the two subjects. Note that while the low international benchmark in PIRLS is concerned sufficient, the acceptable level in PIRLS is the intermediate international benchmark.

109 Department of Basic Education, 2024a: 14-15, 37.

Government's five-year plan, the MTSF, sets two separate targets, for mathematics and physical sciences, specifying 35 000 NSC candidates obtaining a mark of at least 60% by 2024. While the MTSF does not specify that the targets apply to results in the public examinations only, this is generally how the targets have been interpreted, meaning in particular that Independent Examinations Board (IEB) results are not counted. Figure 36 below illustrates the trend for the two MTSF indicators. By 2023, the 2024 target of 35 000 had been met for both subjects. The unevenness of the trends, especially for mathematics, has been found to be due to slightly different levels of difficulty in the examination papers[110]. Given that mathematics and science have been improving in Grade 9 according to highly reliable international assessments – see section 5.1 – improvements in Grade 12 in these subjects are to be expected.

Figure 36: Mathematics and physical sciences high-level passes



Note: In 2023, 28,851 candidates obtained at least 60% in both mathematics and physical sciences.
Source: Department of Basic Education, 2024a.

Despite the fact that targets have been met with respect to high-level mathematics and physical science achievement in Grade 12, a comparison of school supply and university demand reveals that further improvement is very much necessary.

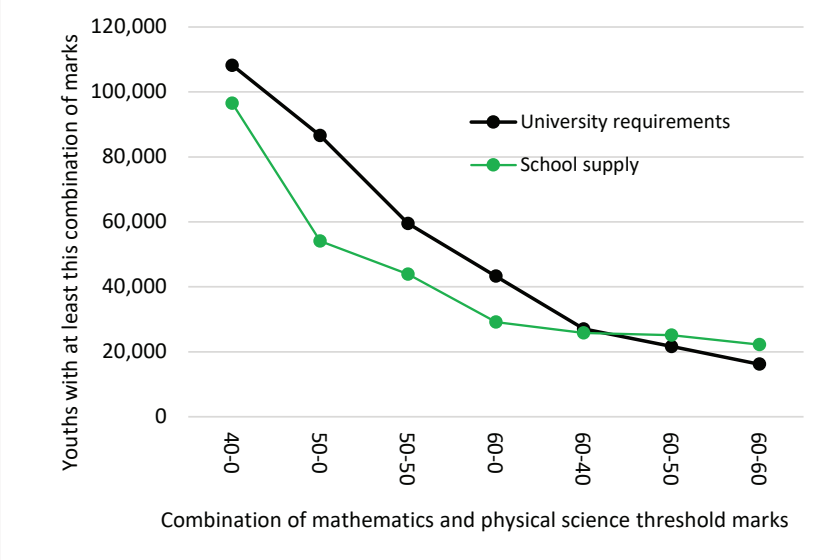
Figure 37 below compares university demand in 2019 to school supply in 2018[111]. While the statistics are a few years old, the basic problem can be assumed to persist. To illustrate, universities required just over 40 000 first-year students in 2019 to have at least 60% in mathematics – see '60-0' on the horizontal axis. Among these 40 000 first-year university students, some were subject to more stringent requirements as in addition to having 60 in mathematics, they also had to have some minimum mark in physical sciences, such as 40 – see the combination '60-40'. At the top end, just under 10 000 first-year students were studying in some programme requiring an NSC mark of 60 in both mathematics and physical sciences – see '60-60'. Importantly, by far most university requirements relating to the two subjects involve some combination of marks of 40, 50 or 60[112]. Very few university programmes require a mark above 60. While school supply roughly matches university demand towards the right of the graph, where a mathematics mark of 60 is required, there is a clear under-supply when it comes to mathematics mark thresholds of 40 or 50. For example, universities demanded around 110 000 learners with a mark of at least 40 in mathematics, but the public examination system produced just under 100 000 such candidates in 2018. In this respect, there was an under-supply of 9%. By 2024 the

110 Department of Basic Education, 2023c: 19.
111 Department of Basic Education (2023d) explains the methodology in full.
112 What is not displayed in the graph is '0-0', students facing no threshold in either mathematics or physical sciences. At that point the 'university requirements' value would be 162 000, the total number of first-year university students. Put differently, 162 000 students would face a requirement of zero or more in the two subjects. This indicates that around two-thirds of first-year students in 2019 (108 163 over 162 000)) were subject to some admission requirement involving mathematics or physical sciences.

number of NSC graduates with at least a mark of 40 in mathematics had increased to around 114 000, or by 18% relative to 2018. However, the university had also grown over this period, though by less than 18%.

The numbers suggest the output from schools should improve across the entire mark spectrum. Ideally, students entering university should have marks that exceed the minimum requirements set by universities by a considerable margin, for two reasons. Firstly, this is likely to assist progress from one year to the next in the university system. University students without a solid foundation in, say, mathematics are more likely to repeat and drop out of mathematically-oriented programmes in the university system. Secondly, not all youths who obtain, say, 60% in mathematics want to pursue a mathematically-oriented programme at a university. Some may choose to pursue studies in areas such as the arts, law or humanities, which tend not to come with entrance requirements relating to the two subjects. The analysis presented in Figure 37 compares aggregates only, and is not based on linked records of individuals across the two sectors. The number of NSC graduates with a mark of at least 40 in mathematics who also enrol in a university programme requiring a mark of at least 40 is thus lower than the 100 000 shown in the graph. The graph thus under-estimates the problem of insufficient supply from the schooling system.

Figure 37: University requirements and school supply 2018-2019



Source: Power HEDA HEMIS data querying facility for numbers of first-year students per 548 'CESM first order' programmes across 26 public universities in 2019. Moreover, analysis of the published admission requirements of a student-weighted and random representative sample of 30 out of the 548 programmes, to arrive at mathematics and physical sciences minimum thresholds. NSC microdata for 2018 analysed for green curve.
Note: To illustrate, '60-40' on the horizontal axis means that a minimum mark of 60 is required in mathematics, and a minimum mark of 40 in physical sciences. Note the values are cumulative, moving from right to left. If someone has 60 in both subjects, they would automatically qualify for an admission requirement of '40-0', meaning 40 in mathematics and no requirement for physical sciences.

One of the ways the schooling system learns to do things better is by examining districts and schools that are relatively successful. The following two maps illustrate an important feature of the mathematics landscape: rural districts are especially successful at ensuring that black learners, defined here as black African and coloured learners, reach a mark of at least 60% in mathematics. This is important, as historically white and Indian learners have been around five times as likely to achieve a mark of 60% in mathematics nationally, compared to black African and coloured learners[113]. The patterns of the two maps raise important questions. What makes certain rural districts so successful when it comes to providing historically marginalised learners with a relatively good mathematics education? Why do urban districts not do

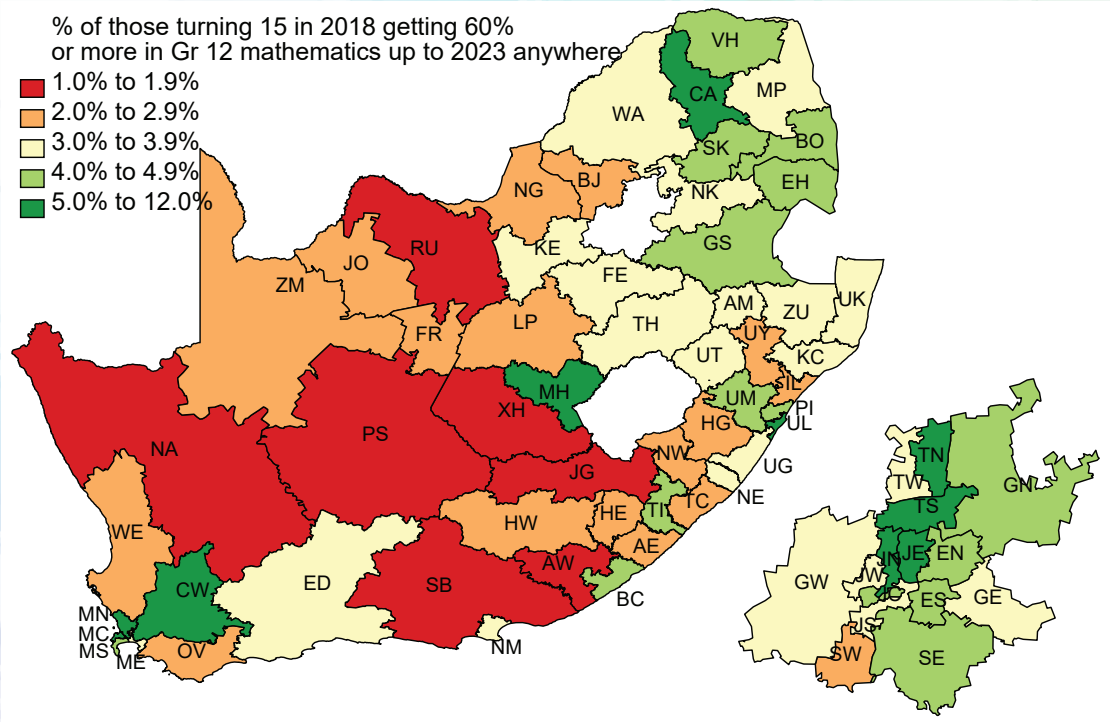
113 Department of Basic Education, 2018d.

better, given that these districts tend to have easier access to appropriately qualified teachers and schools which are geographically more accessible?

The first map, Figure 38, makes use of the same methodology and data as earlier Figure 21. It illustrates the percentage of learners, regardless of population group, who turned 15 in 2018 and who obtained a mark of at least 60% as full- or part-time candidates in the year-end examinations for the years 2019 to 2023. The national average is 4,0% – see Table 7 in Appendix A, which also provides provincial values. The statistic is essentially the percentage of youths obtaining 60% in mathematics given that close to 100% of the population[114] is in a school when turning 15. Importantly, the statistic is not the percentage of NSC candidates obtaining 60% in mathematics. It is the percentage of the youth population.

When all population groups are considered, as in Figure 38, urban districts perform relatively well in ensuring that youths excel in mathematics. The top district is Tshwane South, with a statistic of 11,3%, followed by Cape Town's Metro Central, with 9,9%. What is also noteworthy is there are some rural districts, particularly in Limpopo and Mpumalanga, which appear to perform relatively well, even if they are mostly not in the top category used for the map.

Figure 38: Achievement of 60 or more in mathematics by district



Note: Because of the way the data were arranged, this map reflects the five districts of Limpopo applicable up to 2016, and not the post-2016 situation where each of the five districts were split into two.

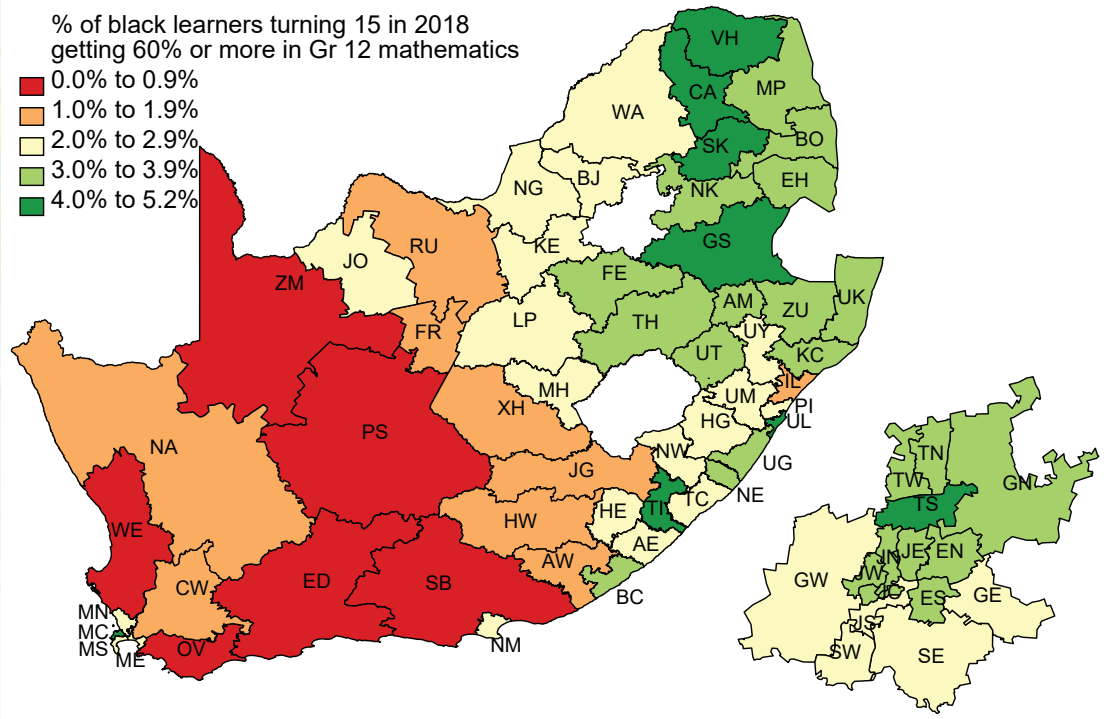
If the same map is reproduced while drawing only on the records for black African and coloured learners, the rather different picture seen in Figure 39 emerges. The national average drops to 3.1% (see Table 7). In this map several rural districts emerge as among the best in the country and a general pattern of rural districts out-performing urban districts is present. To illustrate, the five Johannesburg districts (JC, JN, JE, JS and JW) produce jointly a value of 3,4%, while six clearly rural districts in Limpopo and Mpumalanga[115] exceed this, with Vhembe's value being the highest among the six, at 4.8%. The four Cape Town districts (MC, MN, ME and MS) produce a value of just 2,9%, which is below the national average for black learners. In Free State, the more urban Motheo (MH), which includes Bloemfontein, carries a value of 2,8%, against 3,8% for the more rural Thabo Mofutsanyana (TH). In KwaZulu-Natal the gap is smaller, but still in favour

114 See section 2.

115 Mopane (MP), Greater Sekhukhune (SK) and Vhembe (VH) in Limpopo, and Ehlanzeni (EH), Bohlabela (BO) and Gert Sibande (GS) in Mpumalanga.

of rural districts: a value of 3,1% for the two education districts[116] comprising eThekwini Metro, against 3,3% for the remaining ten, and largely rural, districts in the province.

Figure 39: Achievement of 60 or more in mathematics by district (black youths)



What requires an explanation is how Mpumalanga, and above all Limpopo, are relatively successful in producing high-level mathematics skills, even when all population groups are considered (see Table 7 below), while the Grade 9 TIMSS[117] results in these provinces are relatively poor (see Figure 67). This anomaly has been examined[118] and the evidence suggests that Limpopo and Mpumalanga's success relies to a large extent on ensuring that as many learners as possible reach Grade 12, and do not leave school before then. Statistics in this regard were presented in section 4.5 above. This implies that other provinces are losing potentially well-performing mathematics learners before Grade 12. This, in turn, is likely to be at least in part due to assessments in the earlier grades often not being rigorous enough[119], meaning it can become difficult to identify which learners show the most potential, and should be strongly supported, in the home and at school, in pursuing mathematics, up to Grade 12.

116 Pinetown (PI) and Umlazi (UL).
117 Trends in International Mathematics and Science Study.
118 Department of Basic Education, 2023d.
119 See earlier Figure 26.

APPENDIX A: FOCUS ON PROVINCIAL VALUES

This appendix provides provincial breakdowns of key national trends described in the main analysis.

Demographic trends

Figure 40 below provides the provincial breakdowns of the EMIS-based population estimates of earlier Figure 1. For each age, the mean across the years 2017 to 2023 for the same birth cohort were used, but including only ages 7 to 14, ages where around 99% of children are enrolled. Ages were then converted to what they would be in 2024.

Figure 40: Provincial population estimates by single age in 2024

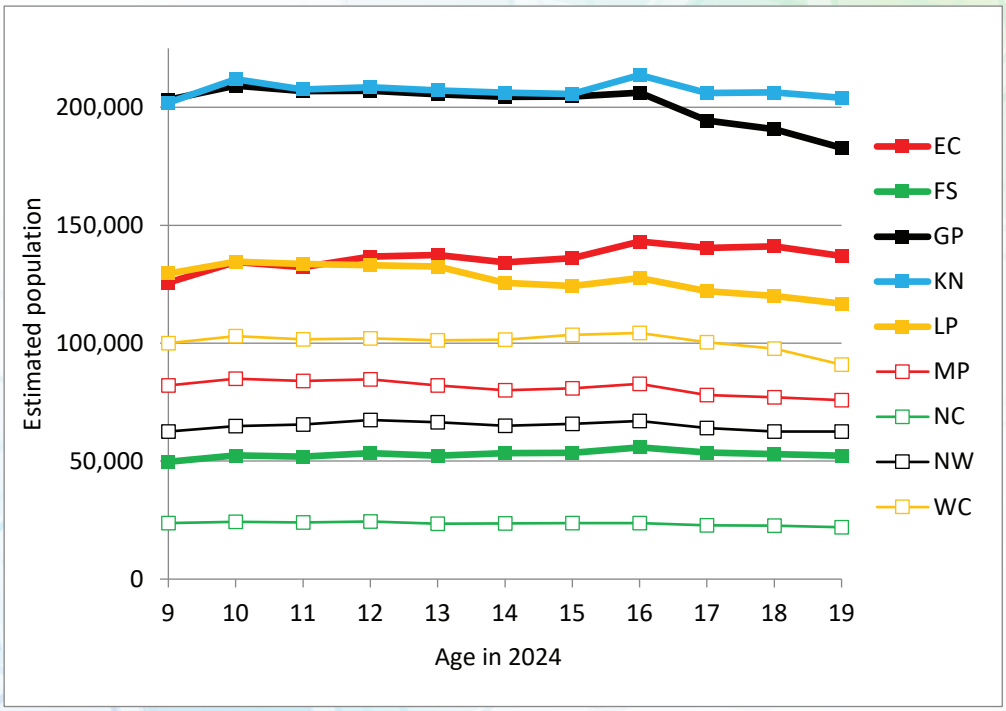


Table 3 below breaks down, by province, the discrepancies with respect to population estimates seen across different sources, using ages 9 to 19 in 2024[120]. Whether Mid-Year Population Estimates (MYPE) or Thembisa estimates are compared to EMIS-based estimates, fairly similar patterns emerge[121]. North West displays the highest ratio for both years, meaning non-EMIS estimates produce particularly high estimates relative to EMIS-based estimates. Limpopo's ratios, on the other hand, are especially low in both columns – for this exceptional province EMIS and non-EMIS estimates are close.

120 Five-year age bins, by province, in the MYPE data were broken down to single ages using a Sprague analysis. Stats SA has from time to time published a tool for this – the tool used here was the one accompanying Stats SA's 2016 MYPE.

121 The two ratio columns in the table produce a correlation of 0,72 across the nine provinces.

Table 3: Population estimate differences by province

	MYPE 2022 against EMIS		Thembisa 2022 against EMIS	
	Difference	Ratio	Difference	Ratio
EC	96,767	1.06	-26,428	0.98
FS	33,478	1.06	56,147	1.10
GP	453,092	1.20	233,808	1.11
KN	286,040	1.13	245,601	1.11
LP	30,956	1.02	44,693	1.03
MP	81,174	1.09	141,131	1.16
NC	12,126	1.05	2,086	1.01
NW	154,294	1.22	148,449	1.21
WC	147,456	1.13	128,102	1.12
SA	1,295,382	1.12	973,589	1.09

The following two graphs illustrate provincial school-age population trends and projections from 1995 to 2030. Kinks in the curves between 2006 and 2007 reflect the effects of the redrawing of provincial boundaries. The most dramatic change is clearly that of Gauteng, which is expected to have 3,2 million people aged 7 to 18 in 2030, against 1,5 million in 1995. Figure 42 facilitates an understanding of changes expected between 2024 and 2030. Gauteng is expected to see an increase of 12%, with Western Cape's increase being 7%. Figure 42 moreover clearly illustrates how between 1995 and 2024 the school-age population doubled in Gauteng while it declined by around 20% in Eastern Cape.

Figure 41: Provincial trends and projections from Thembisa (I)

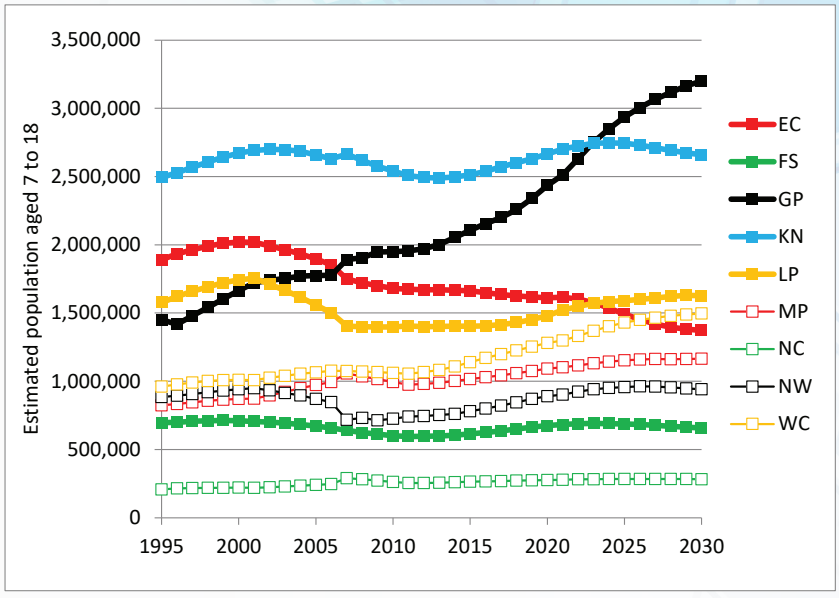
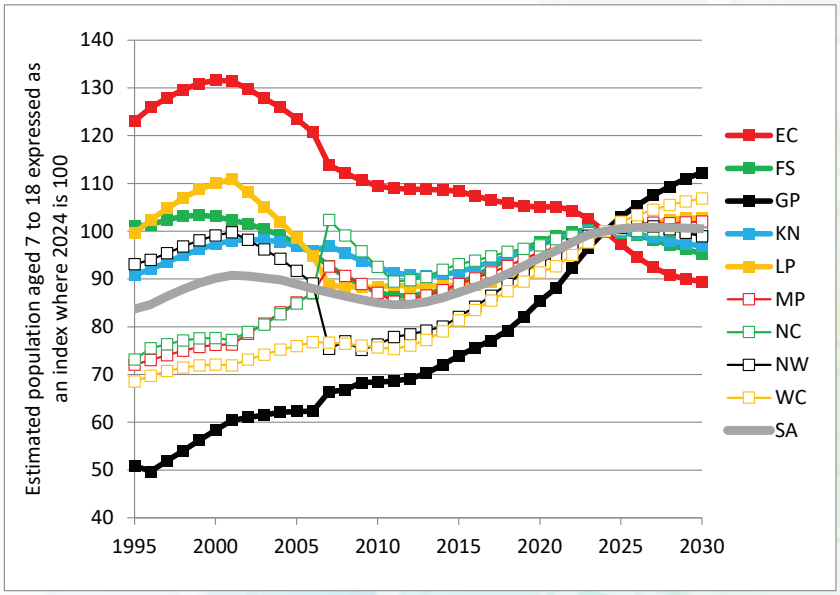


Figure 42: Provincial trends and projections from Thembisa (II)



Planners often ask whether the age range chosen for graphs such as the previous two influence the patterns. There is an influence, though it is mostly negligible, as illustrated by the next graph, which is constructed like Figure 42. Absolute numbers obviously increase as the age range expands, but the percentage increases remain roughly unchanged.

Figure 43: Population trends using different age ranges

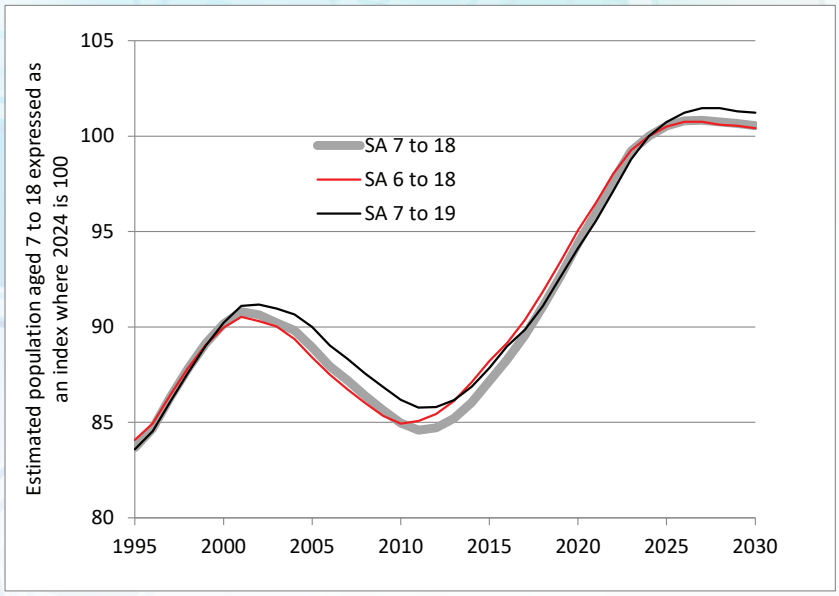
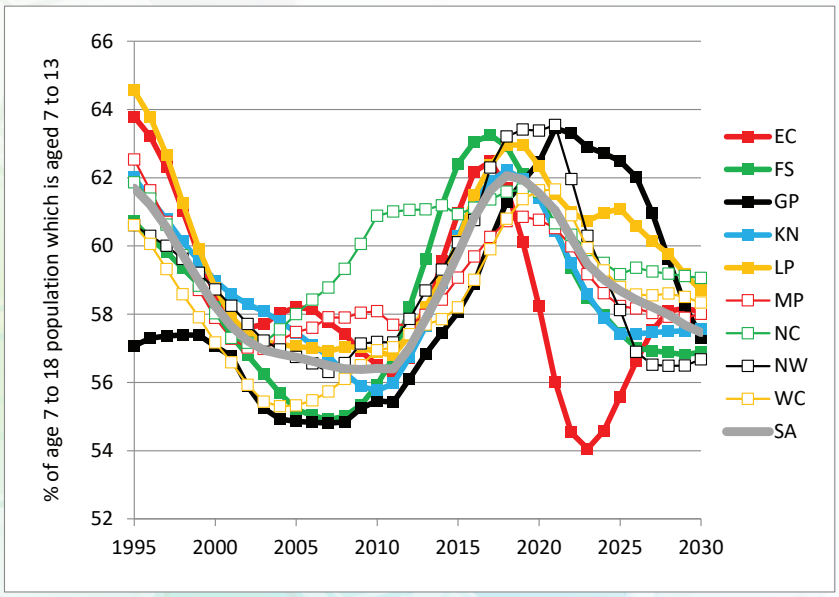


Figure 44 below illustrates the percentage of the school-age population, understood here as aged 7 to 18, which corresponds to the primary level, understood here as ages 7 to 13. The Eastern Cape anomaly of a sudden relative drop in the primary-aged population after 2017 stands out. The absence of a corresponding primary enrolment dip in Eastern Cape – see Figure 53 – suggests that in this regard the Thembisa population estimates may not reflect reality.

Figure 44: Percentage of the school-age population that is primary-aged (by province)

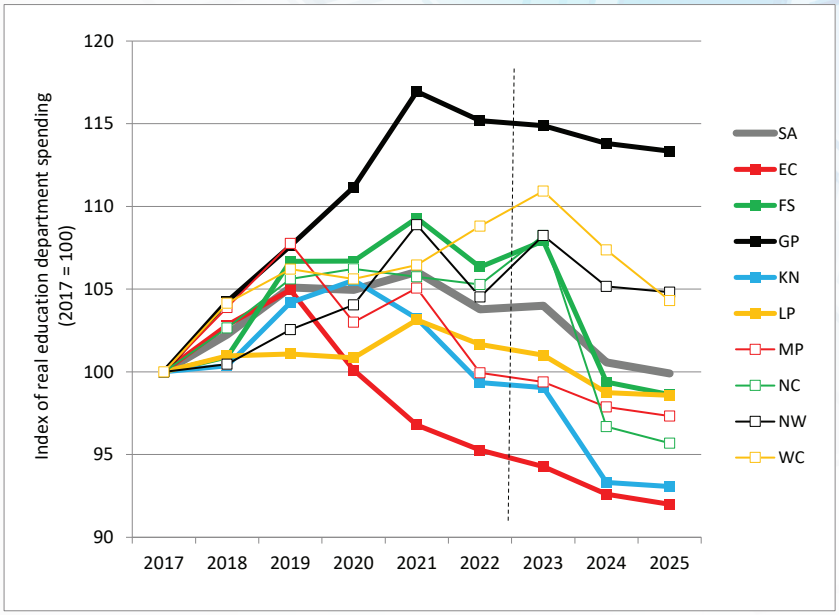


Source: Thembisa.

Financing

The following seven graphs disaggregate by province selected national values seen in earlier Table 2. According to Figure 45, all provinces reflect in some way the up and then down total real spending trend seen nationally. The worst and least affected provinces are Eastern Cape and Gauteng, respectively. This is to be expected given the extreme demographic trends in these provinces (see above graphs within this appendix). However, what is striking is KwaZulu-Natal's sharp downward trend, though demographically this province is fairly stable.

Figure 45: Trends in total provincial education department spending



Note: The vertical dotted line separates final audited figures from estimates.

In Figure 46 below, payments for capital assets are divided by 2022 public ordinary school (POS) enrolments to facilitate a comparison of not just trends, but also levels, across provinces. Cuts in this area are affecting provinces rather

differently, with 2025 expected to see more inequality across provinces in per learner terms than 2017[122].

Figure 46: Trends in total provincial education infrastructure spending

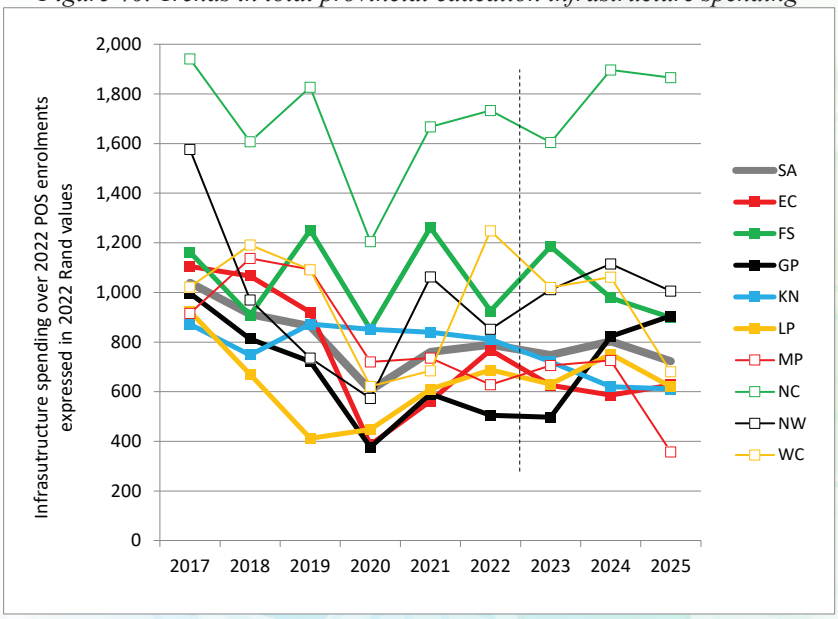


Figure 47 below reflects the relatively healthy protection, at the national level, of non-personnel non-capital (NPNC) relative to all current spending. All provinces display a higher value in 2025 relative to 2017. Yet the low level for NPNC in KwaZulu-Natal across the entire period is striking.

Figure 47: Non-personnel non-capital (NPNC) over total spending

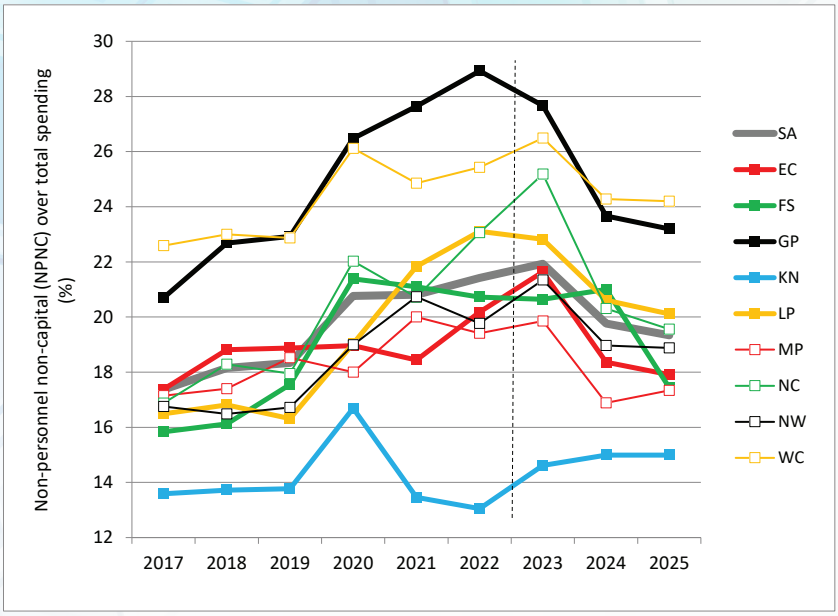
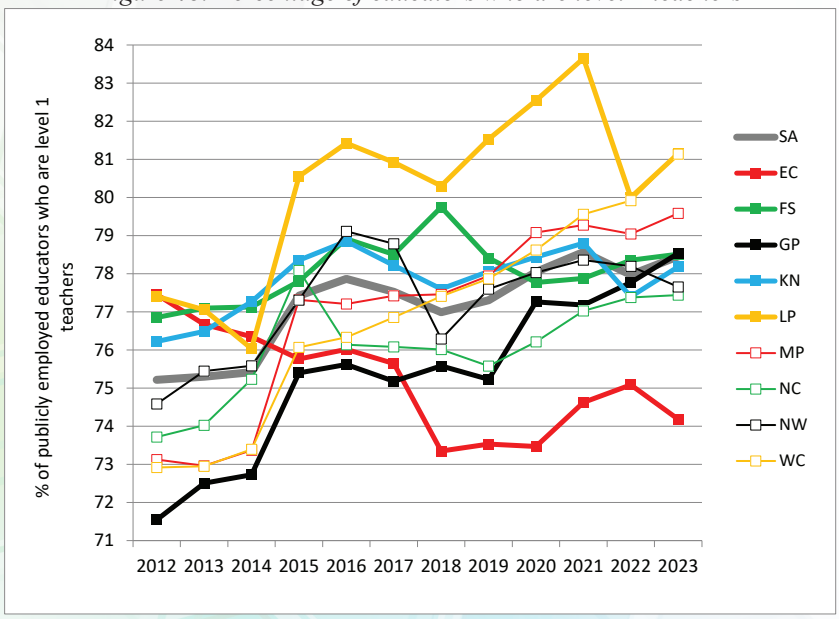


Figure 48 below reflects the erosion of the school management layer as provinces attempt to spend within budget and concentrate on the employment of less costly level 1 teachers. The clear outlier is Eastern Cape, which has seen the proportion of managers increase. This province went from having the highest proportion of level 1 teachers in 2012, to having the lowest in 2022. Eastern Cape is also the province which has seen the largest decline in the total educator workforce, by far, the workforce being 21% smaller in 2023 than 2012. The province has also seen a major consolidation of schools (see Figure 54 below). How these factors have interacted in the province warrants further analysis.

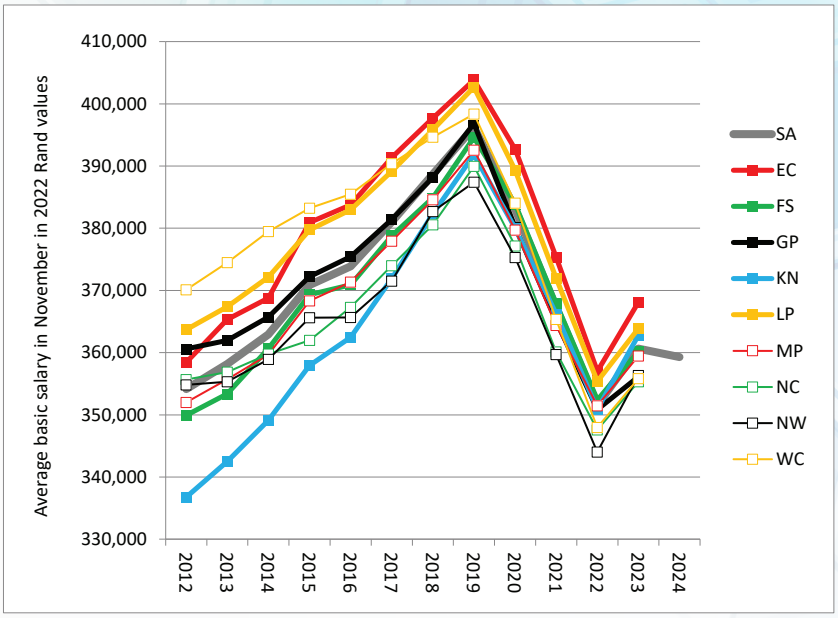
122 The standard deviation across provinces in per learner spending across the two years was compared.

Figure 48: Percentage of educators who are level 1 teachers



Eastern Cape's emphasis on retaining management positions would be one factor contributing to the relatively steep rise of the inflation-adjusted average basic salary in this province – see Figure 49 below. In more recent years Eastern Cape has had the costliest educators. The graph makes it clear that after a fall in the national purchasing power of educators, some recovery occurred, taking levels in 2023 back to where they had been in 2013 and 2014.

Figure 49: Inflation-adjusted average basic salary trends



Note: Notch values which are less than 40% of the entry-level notch for qualified teachers are excluded, as these would be notches for non-typical educators, such as ECD practitioners. This exclusion results in, for instance, a loss of 2% of employees in 2022.

Every province except for Northern Cape displays an upward slope with respect to the learner-educator ratio in Figure 50 below, representing a worsening of the situation.

Figure 50: Learner-educator ratios 2012 to 2023

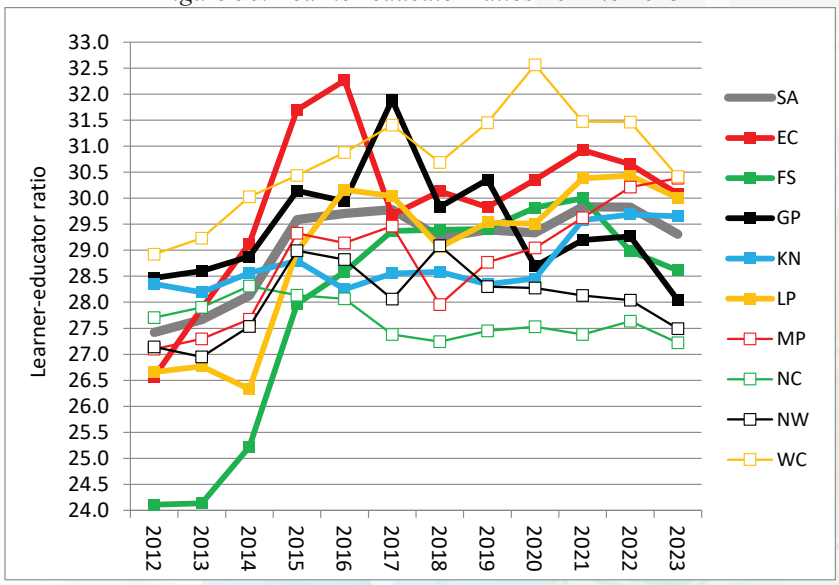
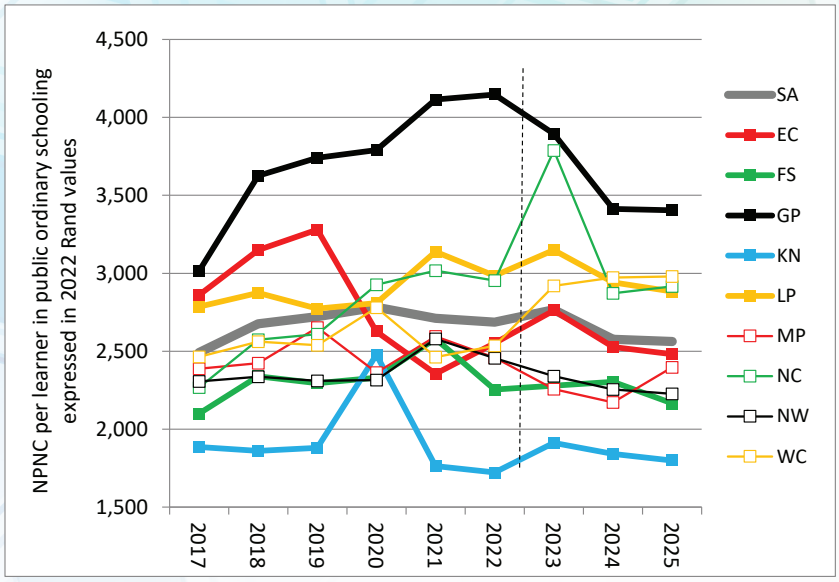


Figure 51 roughly repeats the trends seen in earlier Figure 47, except here the focus is just on POS. Gauteng is clearly particularly successful in terms of protecting spending on supplies for schools. Spending levels in this province are roughly twice what they are in the lowest-spending province, namely KwaZulu-Natal.

Figure 51: NPNC in POS per learner in 2022 Rands



Participation, enrolment, class sizes and attainment

Table 4 below provides provincial values behind earlier Figure 8. The data available for the analysis did not specify what languages fell under 'Other', but virtually all 'Other' is found in independent schools. Table 5 indicates the degree to which learners with a specific home language are taught in that language, as opposed to some other language. The other language is clearly mostly English.

Table 4: Home language distribution across all Grade 3

	English	Afrikaans	IsiXhosa	IsiZulu	SiSwati	IsiNdebele	Sesotho	Setswana	Sepedi	Xitsonga	Tshivenda	Sign Language	Other	Total
EC	6,157	10,389	126,740	116	166	25	3,157	25	12	25	9	9	403	147,233
FS	1,139	4,665	2,666	2,167	24	39	44,548	2,882	64	74	22	3	221	58,514
GP	34,590	14,381	13,924	58,098	1,078	3,201	27,453	22,601	27,503	11,495	4,908	82	5,656	224,970
KN	16,636	1,063	7,734	199,932	62	51	523	31	22	122	74	27	794	227,071
LP	1,743	1,551	216	749	125	1,192	841	2,361	82,841	25,755	24,417	21	1,053	142,865
MP	2,480	2,665	966	26,008	29,830	7,514	1,205	1,275	9,823	10,042	142	19	479	92,448
NC	1,164	13,775	1,149	41	4	4	165	10,853	41	12	13	2	301	27,524
NW	1,181	3,314	2,808	853	122	254	3,213	56,321	1,156	1,719	275	3	903	72,122
WC	20,498	20,169	14,386	32	4	8	132	15	7	19	2		550	55,822
SA	85,588	71,972	170,589	287,996	31,415	12,288	81,237	96,364	121,469	49,263	29,862	166	10,360	1,048,569

Table 5: Degree of home language-LOLT matching

LOLT ➔ Home ➔	English	Afrikaans	IsiXhosa	IsiZulu	SiSwati	IsiNdebele	Sesotho	Setswana	Sepedi	Xitsonga	Tshivenda	Total	% taught in home language	% taught in English	% taught in English (public only)
English	82,889	938	193	367	56	44	82	143	191	46	52	85,001	98	98	97
Afrikaans	5,337	65,720	189	25	2	5	38	287	37		2	71,642	92	7	7
IsiXhosa	35,994	1,453	128,712	1,559	42	62	968	1,605	99	11	3	170,508	75	21	17
IsiZulu	95,470	308	260	188,498	332	488	528	1,308	418	34	7	287,651	66	33	31
SiSwati	6,981	80	162	752	22,895	125	10	155	124	47	1	31,332	73	22	18
IsiNdebele	3,754	22	22	1,267	29	6,088	29	545	516	1	1	12,274	50	31	25
Sesotho	33,705	733	269	767	12	81	42,240	2,491	737	106	26	81,167	52	42	39
Setswana	24,368	884	137	111	4	19	389	69,578	759	10	28	96,287	72	25	22
Sepedi	25,989	163	6	340	11	205	120	2,341	91,792	309	103	121,379	76	21	18
Xitsonga	11,368	44	35	339	76	88	51	3,016	1,758	32,274	174	49,223	66	23	19
Tshivenda	7,246	26		43	2	6	15	375	206	159	21,744	29,822	73	24	18
Total	333,101	70,371	129,985	194,068	23,461	7,211	44,470	81,844	96,637	32,997	22,141	1,036,286	73	32	28

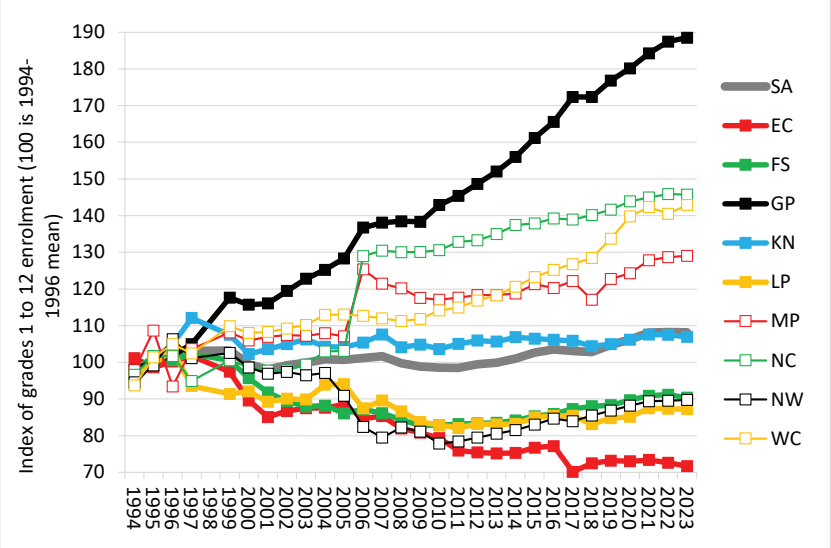
The 73% national figure seen in Table 6 corresponds to the 73% overall figure in Table 5, but in Table 6 the breakdown is by province. The second column in Table 6 presents statistics for public schools only.

Table 6: Grade 3 taught in home language by province

	% taught in home language	
	All schools	Public only
EC	84	88
FS	66	67
GP	44	43
KN	78	79
LP	88	92
MP	70	72
NC	86	87
NW	77	79
WC	93	94
SA	73	75

Figure 52 below displays national and provincial grades 1 to 12 ordinary school enrolment trends, with the 1994 to 1996 average indexed to 100. It is clear that though the national trend was relatively flat, it varied to a large degree across provinces, with Gauteng experiencing almost a doubling of enrolments between 1994 and 2023 and, at the other extreme, Eastern Cape experiencing a decline of almost 30%. This mostly reflects large-scale inter-provincial migration over the period.

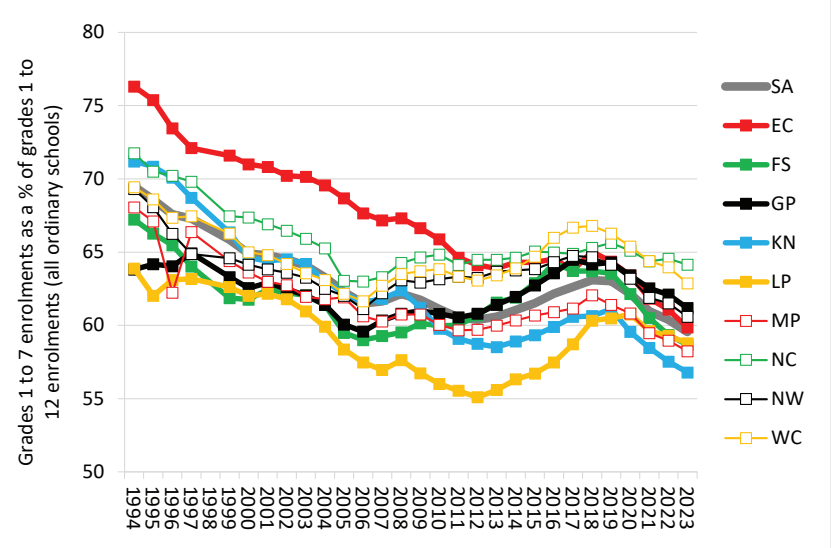
Figure 52: Provincial ordinary school grades 1 to 12 enrolment trends 1994 to 2023



Source: See Figure 11.

Figure 53 below illustrates primary enrolments as a percentage of all grades 1 to 12 enrolments. Patterns are similar across provinces. The temporary reversal of the downward trend from 2012 reflects the relative increases in primary enrolments as children born in the 'births surge' of 2003 to 2005 entered primary schooling.

Figure 53: Percentage grades 1 to 12 enrolments which are primary



Previous Figure 14 illustrated the shift over 17 years towards a more standardised school system, with the percentage of learners schooling in standard primary schools (grades 1, or R, to 7) or standard secondary schools (grades 8 to 12) increasing from 66% to 90% between 2006 and 2023. Much of this change was driven by Eastern Cape, where the statistic went from 29% to 80% over the period. One effect of this was to increase the percentage of Grade 9 learners in a position to proceed to Grade 12 within the same school from 39% to 81% over the period in Eastern Cape. This is likely to be a key reason why completion of Grade 12 rose faster in Eastern Cape than in any other province. The Eastern Cape version of earlier Figure 14 appears below.

Figure 54: Eastern Cape grade configurations 2006 to 2023

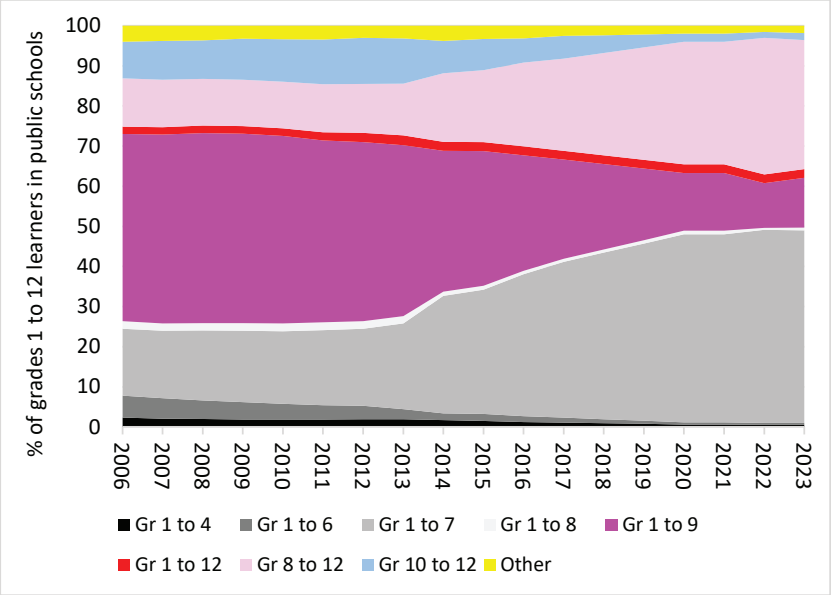


Figure 55 below breaks the 'Gr 1-3 over 40' curve of earlier Figure 16 down by province. In recent years Limpopo, North West and Mpumalanga have displayed the greatest prevalence of class sizes exceeding 40. Limpopo's situation is arguably the most serious insofar as it has displayed the highest prevalence of classes exceeding the much higher threshold of 55 in recent years – see Figure 56.

Figure 55: Grades 1 to 3 learners classes exceeding 40 by province

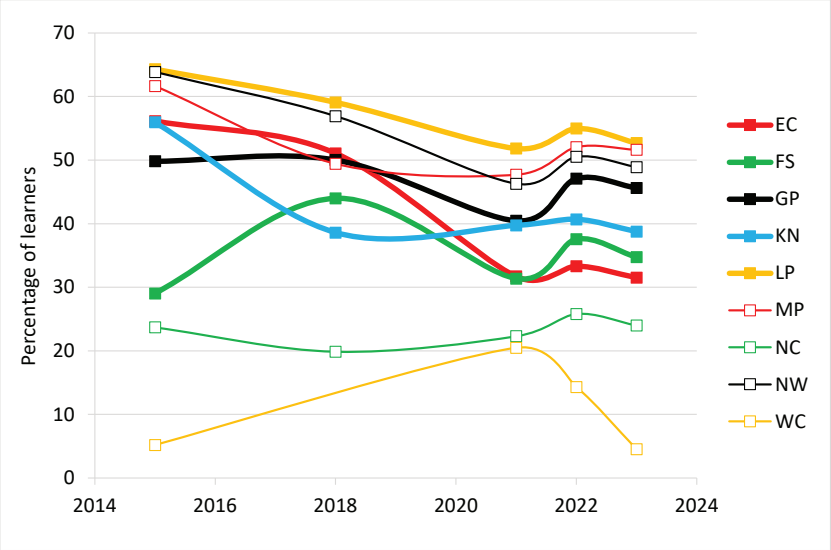


Figure 56: Grades 1 to 3 learners classes exceeding 55 by province

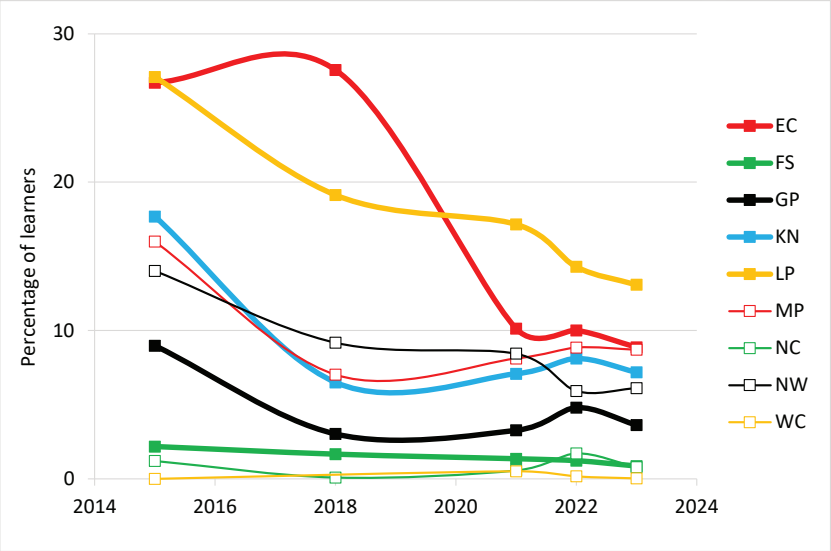


Figure 57 below uses household data to calculate the successful completion of Grade 12, or some equivalent qualification, using the data sources and methods applicable to earlier Figure 19. Using a linear trend across the years 2009 to 2022 reveals the steepest curve being that of North West – a 22 percentage point gain – followed by Western Cape – 20 percentage points. The statistics reflect youths with Grade 12 residing in the province, and would therefore exclude youths who obtained the Grade 12 in the province and then went to another province to study or work. This makes the provincial statistics more difficult to interpret than the national ones, given there would be less cross-national migration of youths than cross-provincial migration.

Figure 57: Successful Grade 12 completion 2009-2012 from household data

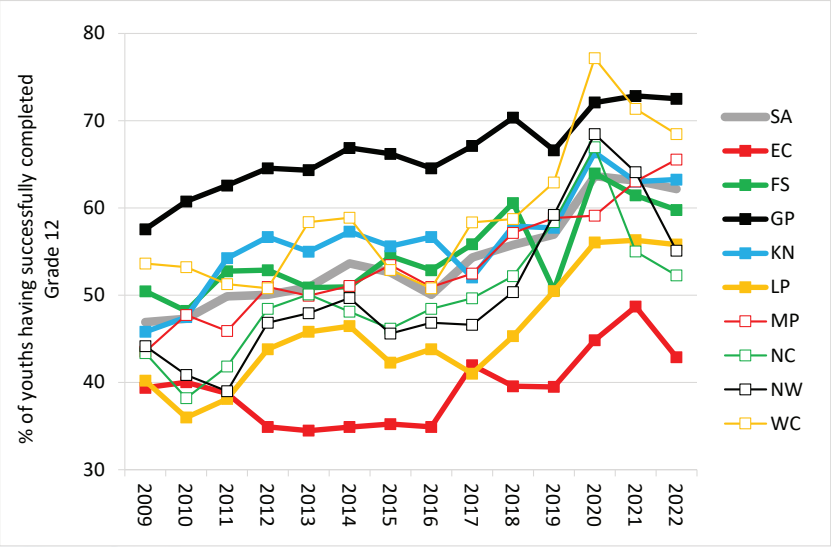
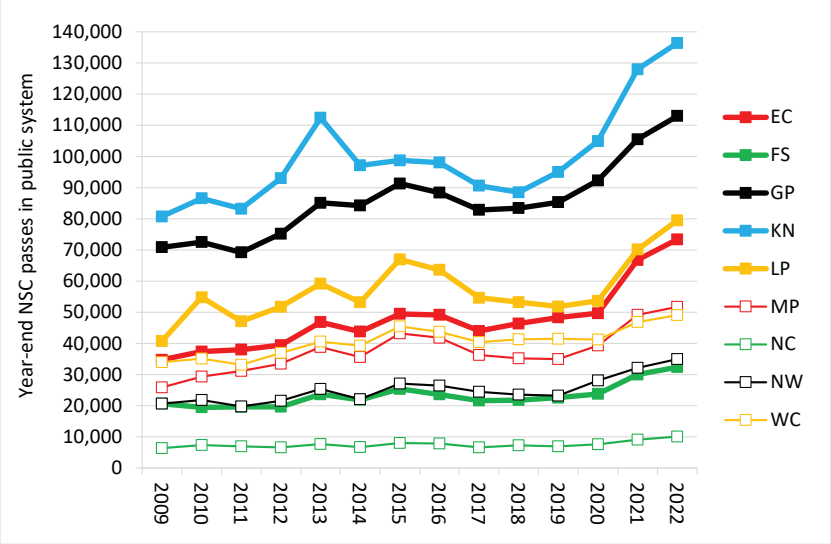


Figure 58 below reflects year-end National Senior Certificates (NSCs) obtained within each province. It is noteworthy that Eastern Cape displays the steepest upward slope, 4,6% a year for the entire 2009 to 2022 period, but also for the pre-pandemic 2009 to 2019 period (3,0% a year). This is despite the fact that Eastern Cape has seen the largest enrolment declines, due to out-migration from the province – see Figure 52. It is clear that Eastern Cape, a province with historically low levels of access to Grade 12 – this largely explains Eastern Cape's weak position in Figure 57 – has more than any province improved this access. But the province will need to see further years of improvement if its situation is to be comparable to that of other provinces.

Figure 58: Year-end Grade 12 passes in the public system 2009-2022



Note: Statistics from the public examination system are used. Around 5% of examination candidates in that system in recent years have been from independent schools.

Figure 59 below uses the same statistics as those for the previous graph, except here values are expressed relative to the 2009 value, to facilitate comparison across provinces. Apart from Eastern Cape, Mpumalanga and Limpopo have increased the number of NSCs to a relatively large degree.

Figure 59: Trend for year-end Grade 12 passes in the public system

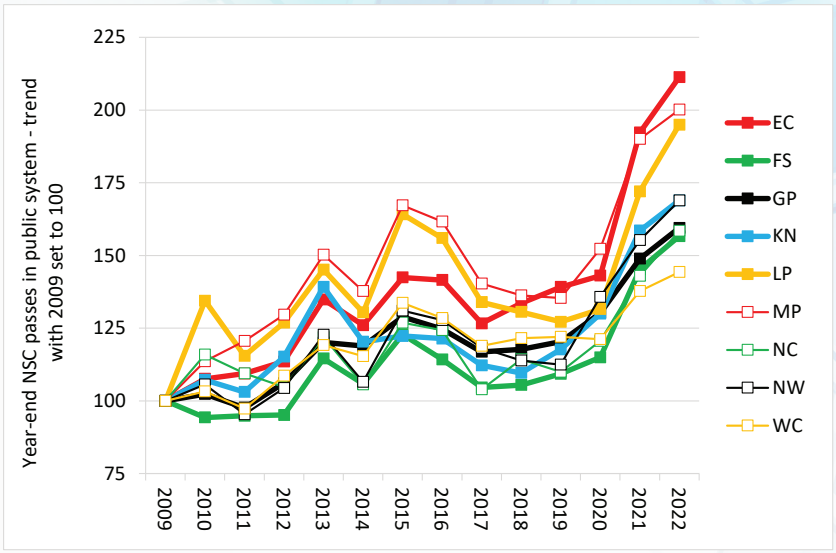
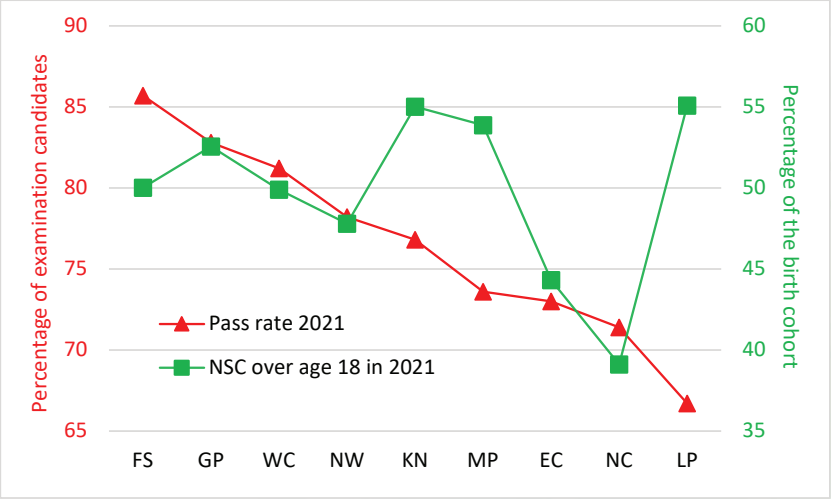


Figure 60 below compares, firstly, the percentage of learners who get to obtain the NSC in the public examination system, in the year-end examinations as a full-time candidate and, secondly, the widely disseminated official NSC pass rate per province. The year receiving attention is 2021, but similar patterns emerge in other years. As is the case for earlier Figure 22, the NSC is counted for the province where the learner was enrolled around age 14, even if the learner subsequently migrated to another province. Importantly, the top three provinces for the first indicator – Limpopo, KwaZulu-Natal and Mpumalanga – are different from the top three provinces for the second indicator – Free State, Gauteng and Western Cape. This underscores the problem with a ranking that focusses narrowly on just the pass rate. Essentially high retention rates, such as in Limpopo, pull the pass rate down as more academically struggling learners are given access to the Grade 12 examination process.

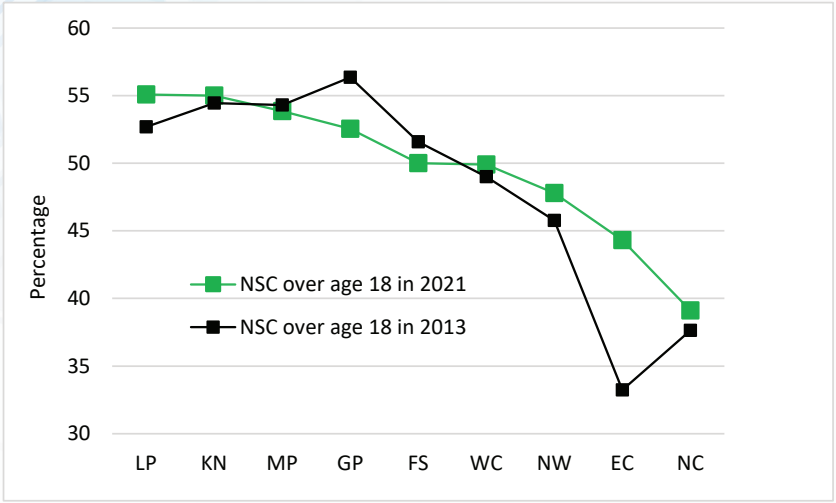
Figure 60: Comparing measures of NSC attainment 2021



Sources: 2021 pass rates are from the official year-end NSC report. 'NSC over age 18 in 2021' reflects the full columns of earlier Figure 22, which focusses on the 2003 birth cohort, and includes some delayed NSC achievement, up to 2023.
Note: The green markers should be read against the right-hand axis. Provinces are sorted from highest to lowest pass rate.

Figure 61 below reproduces the 'NSC over age 18 in 2021' statistics from the previous graph, and compares them to roughly comparable statistics for 2013, calculated using a more rudimentary methodology not involving the linking of individuals across years and datasets. On the whole, the patterns for the two years are similar. However, two important changes stand out. Eastern Cape displays the largest shift over the eight-year period among all provinces, the shift being from 33% to 44% of youths obtaining the NSC. This would be in line with earlier Figure 58 and opportunities for youths brought about by the extensive school restructuring work in Eastern Cape (see Figure 54). At the other end of the spectrum is a substantial decline in Gauteng. This phenomenon has not been properly studied, but it is very possible that the very large in-migration into Gauteng, often by poor migrants seeking better opportunities in the province, has resulted in a decline in the average socio-economic status of learners in the province, and hence a higher proportion of learners whose home circumstances are difficult. The demographic pressures on Gauteng need to be taken into account when education trends for this province are examined.

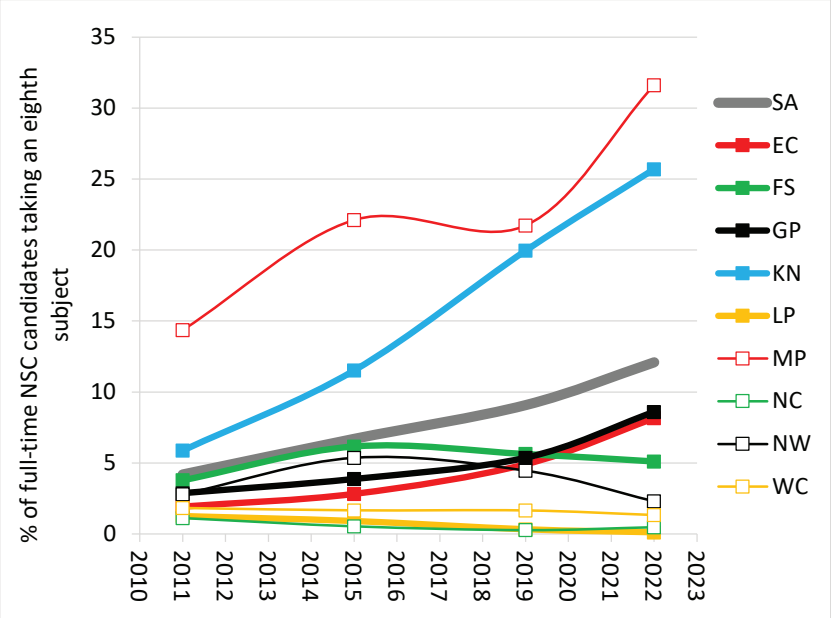
Figure 61: Comparing measures of NSC attainment across 2013 and 2021



Sources: The 2013 statistics are calculated using Department of Basic Education (2016) Table 20. Specifically, the first column from that table is divided by the estimated age 18 population. The 2013 statistics are upwardly biased, relative to the 2021 statistics, due to the fact that the former are implicitly not restricted to achieving the NSC by age 20, as is the case with the 2021 statistics.

Provincial details on the increasing occurrence of an eighth subject among NSC full-time candidates, discussed in section 4.6, are provided below. It is clear that Mpumalanga and KwaZulu have to a large extent driven the national trend.

Figure 62: Percentage of full-time NSC candidates with an eighth subject

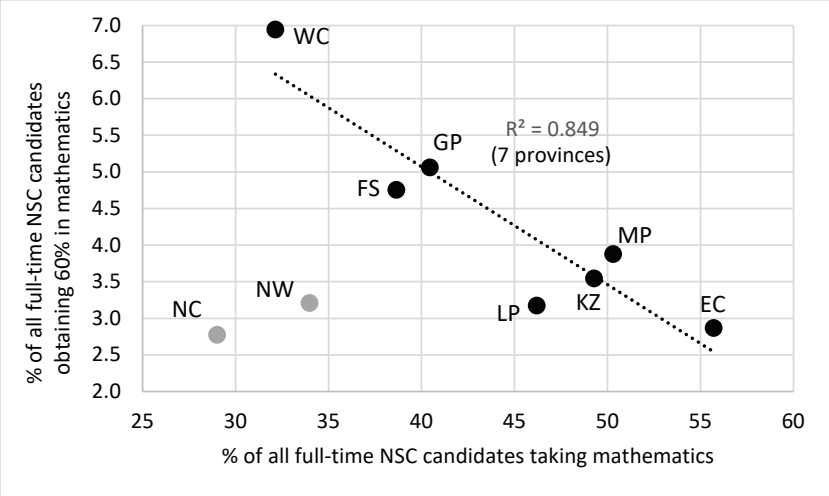


As explained in section 4.6 above, the evidence suggests there are not compelling reasons to expand participation in mathematics, relative to mathematical literacy, at least not until the skills of those moving into Grade 10 improve. A regression analysis for the years 2010 to 2023 suggest that in four provinces a decline in the percentage of NSC candidates taking mathematics explains, at least in a statistical sense, increases in the percentage of all NSC candidates obtaining at least 60% in mathematics. The four provinces are Eastern Cape, KwaZulu-Natal, Mpumalanga and Limpopo[123]. The pattern is clearest in KwaZulu-Natal, where between 2015 and 2023 participation in mathematics declined from 52% to 41%, while the percentage of all NSC candidates obtaining at least 60% in mathematics increased from 3,5% to 5,5%.

What is striking is to compare provinces in one year. Figure 63 illustrates that if one excludes North West and Northern Cape, two provinces which clearly struggle with respect to both high-level achievement and participation, and which account for just 7% of all NSC candidates, there is a clear negative correlation between the two indicators. Lower levels of participation are associated with higher levels of achievement of a mark of 60% in the entire NSC group of candidates (not just those who take mathematics). This would be in line with the hypothesis that when schools limit participation in the mathematics class in a manner that retains more academically strong learners in the class, teachers are better able to focus on learners who stand a chance of obtaining a high threshold mark of, say, 60%.

123 With a dataset at the level of province and year, the percentage of all full-time NSC candidates obtaining at least 60% in mathematics was regressed on the percentage of candidates taking mathematics, year, province dummies, and the interaction between province and percentage of candidates taking mathematics.

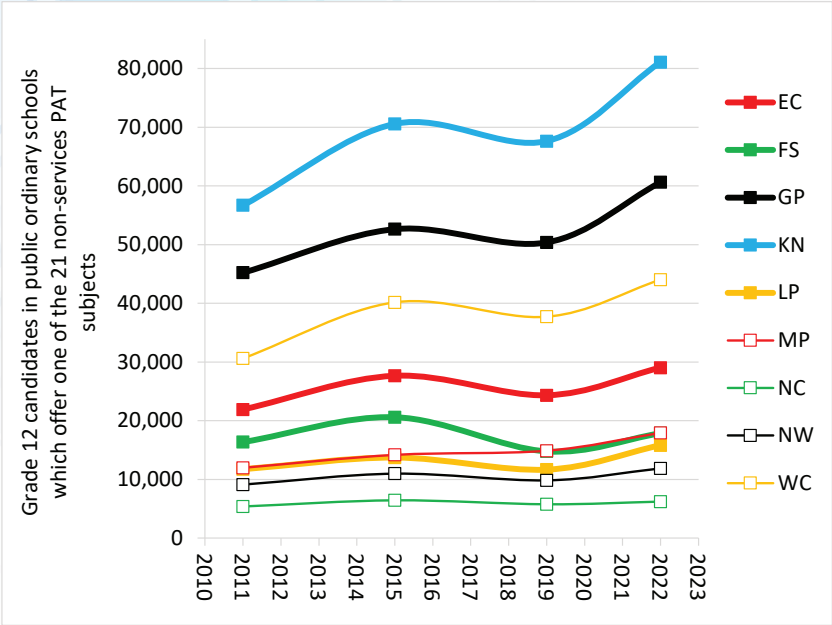
Figure 63: Mathematics participation and high-level achievement in 2019



With respect to the percentage of Grade 12 examination candidates in schools that offer mathematics, nationally this figure stood at 98% in 2022, slightly lower than the 99% seen in 2015. In four provinces the value was lower than 98% in one or both of these years: Eastern Cape (97% in 2022); Northern Cape (96% in both years); North West (97% in 2022); and Western Cape (97% in 2015, 92% in 2022). Western Cape is clearly driving much of the national decline.

Section 4.6 above indicated that it is important to expand access to more practically oriented subjects at the secondary level, specifically the 24 subjects which require practical assessment tasks (PATs). Expansion has occurred, but much of this is driven by just three relatively large services subjects: tourism; consumer studies; and hospitality studies. The challenge is to expand access to the other 21 subjects too. Figure 64 below indicates that in many provinces, the number of Grade 12 learners in public ordinary schools in a school which offers one of the 21 subjects has grown. Nationally, such learners increased from around 209 000 in 2011 to 285 000 in 2022, a 36% increase. This is learners with access to one or more of the 21 subjects. Learners actually taking and also passing at least one of these subjects increased by 39%, from 78 000 to 109 000 over the 11 years[124].

Figure 64: Secondary learners with access to 'niche' practical subjects



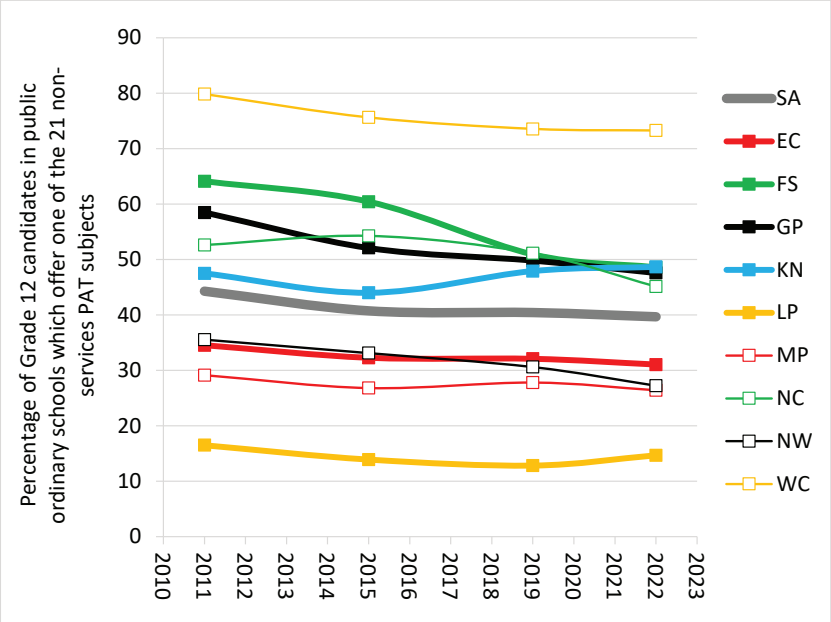
Source: NSC microdata.

Despite increases with respect to absolute numbers, however, these have been too slow to result in a significantly higher percentage of Grade 12 examination candidates having access to the 21 subjects. This can be seen in Figure 65 below. In fact, nationally the percentage of public ordinary school learners having access to at least one of the 21 has

124 These figures are represented by the solid black curve in earlier Figure 27.

declined slightly, even if the absolute number increased between 2011 and 2023 by 36%, as indicated above. Across all provinces, the penetration of the two computer subjects, computer applications technology and the slightly less demanding subject information technology, largely explain the differing levels seen in Figure 65. To illustrate, the 2022 gap between Western Cape and Limpopo is 53 percentage points (73% minus 15%). If the two computer subjects are removed from the analysis, the gap becomes 10 percentage points (14% minus 4%).

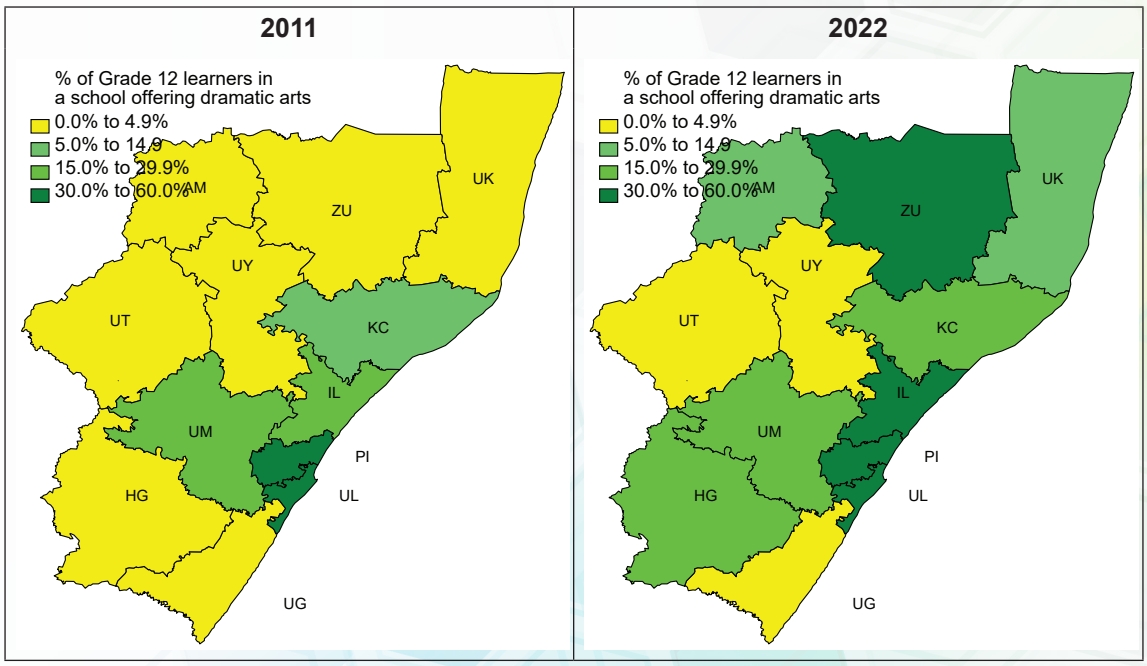
Figure 65: Secondary learners with access to 'niche' practical subjects (percentages)



Source: NSC microdata.

Certain provinces display somewhat atypical emphases. KwaZulu-Natal's above average values in Figure 65 reflect a strong and growing emphasis on dramatic arts in the province. The number of candidates in public ordinary schools taking dramatic arts in Grade 12 more than quadrupled between 2011 to 2022, from 3 402 to 14 997, with the percentage of subject-takers being black African increasing from 86% to 96% over the period. In 2011, 14% of KwaZulu-Natal's public school Grade 12 learners were in a school offering dramatic arts, the second-highest provincial figure, after Western Cape's 20%. By 2022, KwaZulu-Natal's figure had risen to the highest, with 26%. Figure 66 below points to the KwaZulu-Natal phenomenon of increasing dramatic arts access being spread across a geographically diverse set of education districts, though not all districts. Zululand saw the largest increase, from 5% of Grade 12 learners being in a school with dramatic arts in 2011 to 41% in 2022.

Figure 66: Map of access to dramatic arts in KwaZulu-Natal

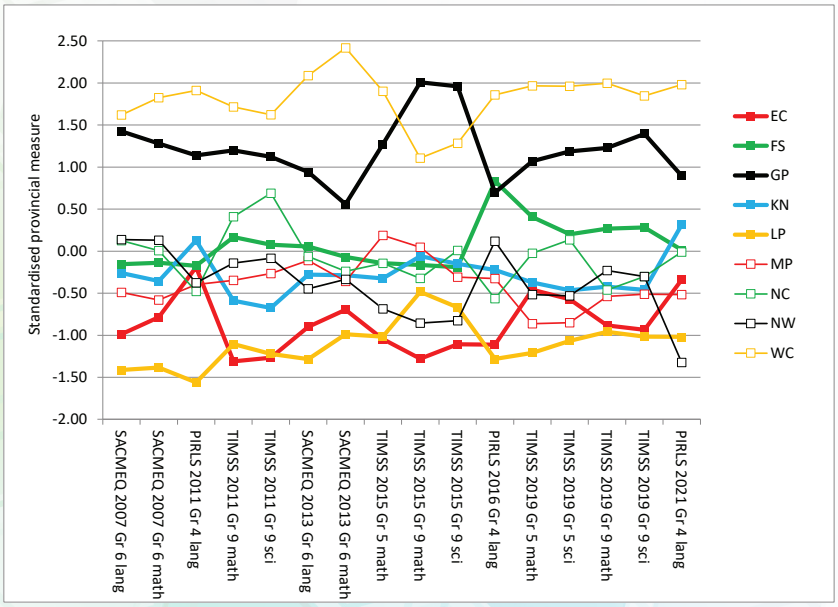


Quality of learning outcomes

Figure 67 below attempts to gauge the relative performance of provinces in the international assessment programmes over time. The upward improvement slopes seen in earlier Figure 32 are not seen here as the average across the nine provincial values is made to be zero in each assessment. Each provincial value is simply intended to compare nine provinces within one of the 16 assessments indicated on the horizontal axis. It is clear that the relative positions of provinces have not changed much over the 2007 to 2021 period covered by the graph. Yet two provinces display noteworthy positive annual trends. The two provinces with the clearest upward slopes are Limpopo and Free State, each with annual improvements of 0,03 up to 2019, something which barely changes if the 2021 PIRLS results, which are unusual due to the pandemic, are included[125]. In other words, Limpopo and Free State are the two provinces which have gained most relative to other provinces. The province with the steepest downward slope is North West, with an annual slope of -0,06 up to 2019 (and -0,04 if 2021 is included).

125 The figure 0,03 emerges when statistics in a provincial series in a graph are regressed on year.

Figure 67: Provincial results in the international testing programmes



Sources: Provincial values are not provided in the international reports, so South Africa-specific reports must be used. TIMSS provincial values are provided in for instance Reddy, Winnaar, Arends et al *(2022) and Reddy, Winnaar, Harvey* et al *(2022). PIRLS values appear in Department of Basic Education (2023e). SACMEQ results appear in Department of Basic Education (2017c).*

Note: Each provincial value is the original provincial score, for instance 448 in Eastern Cape in SACMEQ 2007 language, minus the average of all the nine provincial values, divided by the standard deviation across the nine provincial values. The values are thus z-scores.

Turning to the quality of learning outcomes as reflected in the Grade 12 examination results, the following graph provides provincial values corresponding to the above two maps Figure 38 and Figure 39. In recent years only 4.0% of young South Africans get to achieve 60% more in mathematics, though the situation has been slowing improving. Focussing only on black learners as defined in the table produces a lower statistic of 3.0%. It is noteworthy that Limpopo, with relatively high levels of poverty, displays the country's best statistic, at 4.3%, when it comes to black learners.

Table 7: Percentages of youths becoming 60% mathematics achievers

	All	Black African plus coloured
EC	2.8	2.5
FS	3.9	2.8
GP	4.9	3.3
KN	3.9	3.2
LP	4.4	4.3
MP	4.2	3.8
NC	2.1	1.6
NW	2.7	2.1
WC	5.3	2.2
SA	4.0	3.0

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