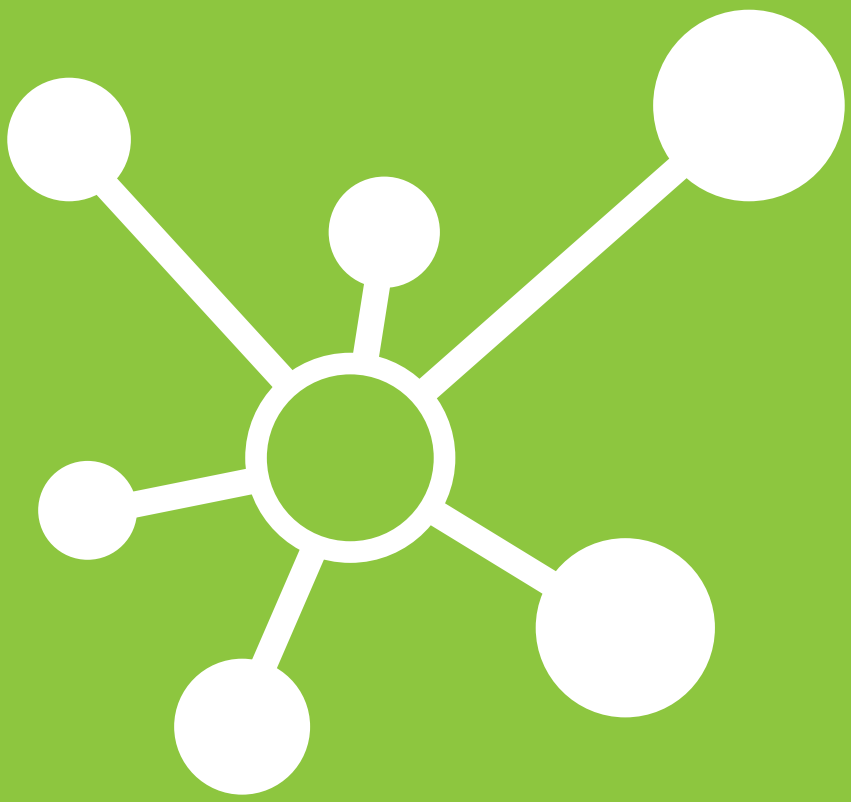
IDENTIFYING BINDING CONSTRAINTS IN EDUCATION

Servaas van der Berg, Nicholas Spaull, Gabrielle Wills, Martin Gustafsson & Janeli Kotzé



RESEP
Research on Socio-Economic Policy

planning, monitoring and evaluation
Department:
Planning, Monitoring and Evaluation
REPUBLIC OF SOUTH AFRICA

PSPPD
PROGRAMME TO SUPPORT PRO-POOR POLICY DEVELOPMENT

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Synthesis Report for the Programme to Support Pro-poor Policy Development (PSPPD)

24 May 2016

Servaas van der Berg, Nicholas Spaull, Gabrielle Wills, Martin Gustafsson & Janeli Kotzé

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Department of Economics, University of Stellenbosch

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Further information regarding PSPPD can be found at www.psppd.org.za

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List of Acronyms and Abbreviations

ANA	Annual National Assessment
ANC	African National Congress
CAPS	Curriculum Assessment Policy Standards
COSATU	Congress of South African Trade Unions
CTLI	Cape Teaching and Leadership Institute
DBE	Department of Basic Education
DoE	Department of Education (Precursor to DBE)
ECD	Early Childhood Development
ELRC	Education Labour Relations Council
NAPTOSA	National Professional Teachers' Organisation of South Africa
NDP	National Development Plan
NECT	National Education Collaboration Trust
NEEDU	National Education and Evaluation Development Unit
NRF	National Research Foundation
NSC	National Senior Certificate
NSES	National School Effectiveness Study
OTL	Opportunity to learn
PSBC	Public Services Bargaining Council
PIRLS	Progress in International Reading Literacy Study
REQV	Relative Education Qualification Value
SACE	South African Council of Educators
SAOU	SA Teachers' Union
SACMEQ	Southern and Eastern African Consortium for Monitoring Educational Quality
SADTU	South African Democratic Teachers' Union
SGB	School Governing Body
TIMSS	Trends in International Mathematics and Science Study

Executive Summary

This research report provides an overview of a large research project undertaken by a team of economists at Stellenbosch University in 2015/16 under the Programme to Support Pro-poor Policy Development (PSPPD), a collaboration between the European Union and the South African Presidency. The project generated eight journal articles, six working papers and 12 policy briefs (Chapter 13). The present research report aims to bring these findings together and show how their varied diagnoses and proposals hang together and provide a coherent portrait of the challenges in the education system as well as viable solutions.

Throughout the analysis, the researchers applied two 'conceptual lenses.' The first was one of prioritisation and acknowledging that identifying and solving binding constraints was a prudent use of limited government resources. The second was an acknowledgement that the root causes of South Africa's low educational outcomes, while multifaceted, generally fall into one of two categories: (1) a lack of accountability, and (2) a lack of capacity. Consequently any proposed solution would need to address both of these elements to gain traction.

From the various reviews of existing literature and new research conducted for this project, there emerged four binding constraints to improved educational outcomes for the poor. These were: (1) Weak institutional functionality, (2) Undue union influence, (3) Weak teacher content knowledge and pedagogical skill, (4) Wasted learning time and insufficient opportunity to learn. These four factors interact and lead to low educational outcomes for the poor.

The centrality of learning to read

The most important of these outcomes is the fact that approximately 58% of South African children do not learn to read for meaning in any language by the end of Grade 4. Unless students have been given sufficient opportunity to 'learn to read' they cannot subsequently 'read to learn.' Irrespective of the subject, the South African curriculum assumes that children have learned how to read by the end of Grade 3, an assumption that is not supported by the evidence. Most South African children are not acquiring the most basic reading skills (in any language), so remaining on the periphery of the learning process and never fully accessing the

58%

of South African children

do not learn to read for meaning

in any language by the end of Grade 4

curriculum despite being promoted to higher grades. The ability to read is central to the ability to learn and therefore a prerequisite to progress successfully through the education system. Consequently the report makes a strong recommendation that the central focus of the South African educational administration should be the following goal: "Every child must learn to read for meaning by the end of Grade 3." This goal is measurable, understandable and pedagogically sound. Put simply, this must become the over-arching goal of the Department of Basic Education, with the concomitant prioritisation of resources and political will to achieve this foundational goal.

The end-point of such a process of prioritisation is focusing on developing the skill of reading in primary school

1) The Binding Constraints Approach

This research project takes as its point of departure that not all constraints in education bind equally and consequently that there was a need to prioritise. A strong case can be made that radical prioritisation is the most promising path to improvement in South Africa. This is in accordance with the principal policy and planning document of the Republic – the National Development Plan – which argues that "... senior public officials should focus most of their attention on a few strategic priorities" (RSA, 2012, p. 59). It is argued that the end-point of such a process of prioritisation is focusing on developing the skill of reading in primary school. Why is prioritisation so important? One answer to this question is that constraints and hence solutions have a hierarchy. There are certain things that must be tackled first, since they preclude progress in other areas. A further justification for prioritising would be that it is often impossible for governments to focus well on many interventions at once. It is often better to do a few things right than tackle a wide range of things and obtain mediocre results.

2) Binding Constraint #1: Weak Institutional Functionality

Given the decentralisation of educational powers to provinces in South Africa, and consequently that policy implementation is largely a provincial competency, the quality of policy implementation depends to a large extent on province-level functionality. The National Development Plan emphasised this point and stressed that the quality of provincial and local governance is uneven and too often of an unacceptably low standard (RSA, 2012, p. 408). This then leads to large differences in how the same policies are implemented in different provinces. While most researchers and policy-makers agree that state functionality is important for effective implementation, it

is notoriously difficult to measure or quantify exactly how important it is. If one wanted to quantify this in the education domain one would ideally need to relocate a school and its community from a province with weak institutions and capacity (such as the Eastern Cape), to one with stronger institutions and greater capacity (such as Gauteng), and then assess the level of improvement. Typically this is not feasible. However, as part of the PSPPD project Gustafsson & Taylor (2016) were able to do exactly this.

Due to an unusual administrative change in 2005, some schools were reallocated to different provinces. This was due to the changes of provincial boundaries in 2005 to ensure that no municipality was split between two provinces. As a result of the re-drawing of the provincial boundaries, 158 high schools were effectively placed under new administrations. For example, 29 schools 'moved' from the North West (a traditionally underperforming province) into Gauteng (a traditionally better performing province). The researchers found that for those schools that 'moved' to a more functional province there were significant improvements in matric results within five years. As the researchers note "The school-level improvements ultimately brought about were considerable, about as large as one year of progress in a rapidly improving schooling system elsewhere in the world." The researchers note that Gauteng seems to have implemented a deliberate strategy of appointing top education officials on fixed-term (as opposed to permanent) contracts. In 2005 95% of the top-paid 100 public servants in Gauteng were on permanent contracts, but by 2014 this had dropped to 60%. This research shows the clear need to improve the province-level administration of under-performing provinces, notably the Eastern Cape and Limpopo.

Schools placed under a more

functional provincial administration

showed significant improvements in matric results within five years

3) Binding Constraint #2: Undue Union Influence

In the South African context, there is concern expressed among academics and practitioners (and the public at large) that the influence exerted by trade unions, specifically the majority union SADTU, is interfering with the ability of the system to act in the best interests of children. This in turn undermines efforts to implement higher levels of accountability and compromises capabilities in the sector. The researchers identified five mechanisms through which undue union influences undermines the functionality of provinces and the learning outcomes of children. These are (1) Compromised post-provisioning processes and consequent overspending on teacher salaries, (2) Compromised design and implementation of accountability systems, (3) Compromised independence

and accountability function of the South African Council of Educators, (4) Compromised bureaucratic accountability, and (5) Compromised levels of citizen trust in the public education sector. These five factors are especially important in the appointment and promotion of teachers, principals and government officials. Nepotistic appointments linked to union membership appear to be a serious and systemic problem in South Africa. The interim findings of the Volmink Commission (Maromo, 2015) highlight corruption concerns in the appointment of school principals in SA, going against the law and aspirations of South Africa's democratic constitution. Addressing these concerns is all the more urgent given the large number of principal retirements in the next five years. Research on school principals by Wills (2015) found that in 2004, 17% of South Africa's school principals were aged 55 or older. By 2012 this had risen to 33%. Between 2004 and 2008, about 350 to 500 principals per year retired and were replaced. In the next decade, this figure is expected to grow to at least 1 000 principal retirements per year. This provides a window of opportunity to install good leaders across the school spectrum. Since principals remain in the same job for many years, almost nine to ten years on average, selecting competent principals is very important.

79%

of Grade 6 mathematics teachers have a content knowledge level below the Grade 6/7 level

4) Binding Constraint #3: Weak Teacher Content Knowledge & Pedagogical Skill

A large body of local research has shown that many teachers lack basic levels of content knowledge and pedagogical skills. The SACMEQ 2007 study assessed Grade 6 mathematics teachers as well as their students. This study showed that only 32% of Grade 6 mathematics teachers in South Africa had desirable subject knowledge in mathematics (Hungi *et al.*, 2011, p. 52), compared with considerably higher proportions in other countries such as Kenya (90%), Zimbabwe (76%) and Swaziland (55%). There were also considerable differences between provinces within South Africa with Mpumalanga, for example, having almost no maths teachers with desirable content knowledge (4%), while in the Western Cape the proportion of teachers that were adequately equipped was considerably higher (64%).

More recent research by Venkat & Spaull (2015) – also on SACMEQ 2007 – shows that almost four out of five (79%) grade 6 mathematics teachers have a content knowledge level below the Grade 6/7 level, i.e. below the level they are currently teaching. These teachers are highly concentrated in the poorest four quintiles of schools, suggesting that inadequate teacher content knowledge

in poor schools perpetuates a cycle of poor educational outcomes for students, further entrenching their poverty and weak labour-market status. This finding is borne out by examining South Africa in regional context; it is the only country in the SACMEQ group where the difference in mathematics teacher content knowledge between the poorest and richest school quintiles is statistically significant.

Hoadley's (2016) literature review for this project and for the related Zenex research project, in combination with various research findings spanning from 1999 to 2015, confirms that weak teacher knowledge creates a low ceiling which South Africa, as a country, cannot circumvent. We agree with the McKinsey Report (2007) which concludes that the quality of an education system cannot exceed the quality of its teachers

5) Binding Constraint #4: Wasted Learning Time and Insufficient Opportunity to Learn

In the early stages of the present project, it became clear that student's exposure to learning opportunities (opportunity to learn, OTL) would be a major focus of the overall findings, given that it features prominently throughout the academic literature and in South African policy documents. It is likely that the low levels of OTL could have their roots in both a lack of capacity (teachers lack the content knowledge and pedagogical skill to teach some content areas) and a lack of accountability (no monitoring by the principal or district officials).

A number of South African studies have aimed to measure OTL and have frequently found that less than half of the official curriculum is being covered in the year and fewer than half of the officially scheduled lessons are actually taught. The NSES study of 2007–2009 showed that most Grade 5 children write in their books only once per week or less. Only 3% of Grade 5 students across South Africa wrote in their books every day. In Grade 4 and Grade 5 exercise books, about half of all exercises in the year were single word exercises. As one of the researchers notes "Of greatest concern is how little extended writing there is in the books…, learners write one paragraph every month and a half of school." (Dechaisemartin, 2013, p.170). A shocking 44% of Grade 4 students had not written any paragraphs during the entire school year.

In 2011 the Department of Basic Education surveyed a nationally-representative sample of approximately 2 000 schools from across the country (both primary schools and high schools). This survey

44%

of Grade 4 students had not written any paragraphs during the entire school year

85%

of Gauteng students

27%

of Eastern Cape students

24%

of North West Province students covered the bare minimum number of exercises required for curriculum coverage

included an analysis of exercise books at the Grade 6 and Grade 9 levels. They found that only 53% of students nationally had covered the bare minimum number of exercises required for curriculum coverage[1]. However, this figure differs substantially by province. While 85% of students in Gauteng and 76% of Western Cape students had completed this (low) number of exercises per month, only 27% of students in the Eastern Cape and 24% of students in the North West had done so (RSA, 2015, p. 68).

Research undertaken by Hoadley & Galant (2016) on "The DBE Workbooks as a curriculum tool" explored three possibilities for workbook use, namely using them as a practice tool, an assessment tool, and a monitoring tool. In this respect, the authors conclude that: "The overall high level of curriculum compliance of the workbooks suggests they could be effective as a monitoring tool at a systemic level. It would be possible to gain a crude measure of coverage in key content areas" (Hoadley & Galant, 2016, p. 20). In their analysis they go further and comment on the potential complementarity of textbook and workbook: "With the recent proposal to produce a single textbook per subject per grade, this textbook could usefully be aligned with the workbooks. The textbook could then function as a primary transmission text, with clear conceptual signalling as well as relevant tasks, and the workbook could function as a practice tool, either for use in class or as a homework resource" (Hoadley & Galant, 2016, p. 21).

6) Learning from the Past: Understanding Why Previous Reading Initiatives Failed

The central argument of this research report is that learning to read for meaning and pleasure in the Foundation Phase is the single most important goal for primary schooling. Yet this is not a goal. The central argument of this research report is that learning to read for meaning and pleasure in the Foundation Phase is the single most important goal for primary schooling. This goal is pedagogically sound, given that reading is the core academic skill upon which all other skills build, as well as easy to understand and easy to measure. However, it is not new. A number of national and provincial education departments have launched different reading initiatives, strategies, interventions and policy documents in the last decade, all focussing (to various degrees) on reading in the Foundation Phase. Unfortunately there have been almost no success stories, at least in terms of improved reading outcomes verified by a rigorous evaluation.

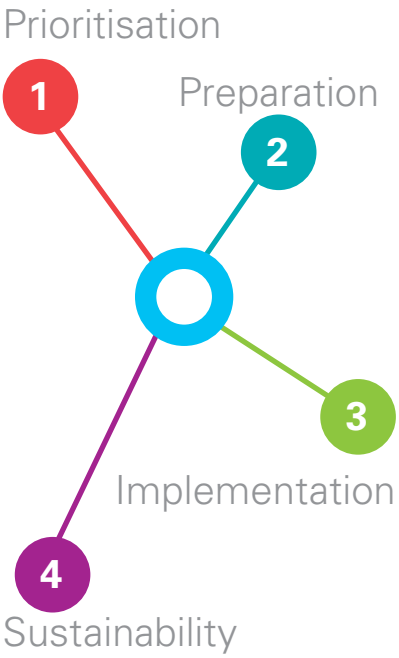
1 For instance, the Department used a threshold of seven mathematics exercises a month at the Grade 9 level or six language exercises a month in Grade 6.

Understanding what these reading strategies entailed and why they (mostly) did not succeed is the aim of Chapter 9 of the report. This chapter reviews nine policies: (1) the *National Reading Strategy* (DoE, 2008a), (2) *WCED Numeracy and Literacy Strategy 2006–2016* (WCED, 2006), (3) Foundations for Learning Campaign (DoE & UNICEF, 2008), (4) Gauteng Primary Literacy Strategy 2010–2014 (GDE, 2010) and (5) the Western Cape's *Living Lab Schools (2015).*

Given the large number of literacy interventions and reading programmes that have been launched by the national and provincial education departments (only the most notable of which are mentioned here), it is prudent to ask why almost all of these initiatives were not sustained for more than a few years. If any one is to develop a new strategy to ensure all children read, it is essential to determine why previous initiatives did not stand the test of time.

7) A 'Roadmap for Reading' and Additional Policy Recommendations

The penultimate chapters of the report provide policy recommendations related to reading specifically (Chapter 10) and five other areas of policy concern (Chapter 11). Chapter 10 is structured as a "Roadmap for Reading", outlining the four stages needed for successful implementation of a national reading strategy. This can be found in Table 1 below. They are (1) Prioritisation, (2) Preparation, (3) Implementation, and (4) Sustainability. Across each of these stages there are six core components that hang together and need to be aligned if they are to achieve the desired outcomes. These 6 components are (1) Beginning, (2) Collaboration, (3) Capacity, (4) Accountability, (5) Alignment, and (6) Budget.



Five further policy recommendations are provided in Chapter 11, namely (1) Agreeing on minimum norms and standards for post-provisioning and implementing them within five years, (2) Correct utilisation of the DBE Workbooks as a basic measure of curriculum coverage as well as reformulating the Annual National Assessments as a measure of learning outcomes in primary schools, (3) Increasing the calibre of school principals by instituting independent competency assessments and performance management contracts for principals as well as promulgating meritocratic appointment processes for appointment and promotion, (4) Stabilising early childhood development by increasing funding for ECD as well as developing appropriate training programmes for ECD practitioners (both existing and prospective), and (5) Better utilisation of data to eliminate understaffing in primary schools.

Table 1: *A Roadmap for Action: Four Stages to Getting Reading Right*

Priority Early Grade Reading Goal for the DBE: "All learners read fluently and with comprehension by the end of grade 3."				
	1. PRIORITISE	**2. PREPARE**	**3. IMPLEMENT**	**4. SUSTAIN**
(A) Beginning	Fast-track plans to establish a Directorate of Primary Literacy.	Effectively brand and communicate the national early grade reading strategy and reading goals across all education tiers.	IN-SET on 'how to teach reading' administered across all districts for all foundation phase teachers.	Bi-annual feedback to all education tiers about school and district performance against measurable reading goals.
(B) Collaboration	Request an implementation analysis (IA) of prior early grade reading and literacy strategies.	Engage with DHET and education faculties to address system weaknesses identified in organisational capacity audit.	Developed PRE-SET course on 'how to teach reading' implemented across HEIs offering teacher training courses.	Independent and nationally representative test of Gr. 3 reading proficiency linked to national assessments.
(C) Capacity	Request a capacity audit of the education system to effectively teach reading to learners in early grades. Early literacy research in African languages declared a NRF priority area	Collaborative engagement with the DHET and education experts to develop PRE-SET and IN-SET training courses on 'how to teach reading'.	Foundation phase teachers and HODs track oral reading fluency and DBE workbook coverage of individual learners using SA-SAMs.	A ministerial performance agreement linked to reading goals housed outside the DBE.
(D) Accountability	Establish shared and independently benchmarked standards for reading in both English and mother tongue language.	Develop SA-SAMS module to capture oral reading fluency scores of Gr 1–4 learners and track curriculum as reflected in DBE workbook coverage.	PDEs and national DBE monitor system performance using the SA-SAMs reports on oral fluency and DBE workbook coverage.	Public awards for districts and schools for effective implementation of foundation phase reading strategies.
(E) Alignment	Reformulate a national early grade reading strategy using earlier strategies and findings from the IA.	Education experts to train current and newly appointed foundation phase reading specialists from province and district offices.	Public awareness campaign of early grade reading competencies in all provinces and in all official languages.	All important DBE planning documents to explicitly prioritise the early grade reading competency goal.
(F) Budget	Comprehensive budget analysis of the cost of implementing the national early grade reading strategy.	Specialist Foundation Phase reading experts deployed across districts and Foundation Phase class sizes reviewed	Ensure Foundation Phase classes are not overcrowded and no Foundation Phase class exceeds 45 learners	Create viable career paths for Foundation Phase teachers and specialists

8) Conclusions

The binding constraints approach adopted in this research project recognises that addressing systemic challenges effectively requires a high degree of prioritisation. It is impossible to simultaneously address all issues. This report together with the research articles, interviews and discussions that underpin it identifies four binding constraints which must all be addressed if there is to be a meaningful improvement in learning outcomes for poorer children.

Four binding constraints in learning outcomes for poorer children

1. Weak institutional functionality;
2. Undue union influence;
3. Weak teacher content knowledge and pedagogical skill;
4. Wasted learning time.

Since a lack of accountability and a lack of support interact with each other to produce these problems, they must both be addressed to achieve meaningful change and maximise the benefits of intervention.

> The consequences of these constraints and their influences on other constraints in the education system are extremely weak educational outcomes. The most alarming of these weak outcomes is the failure of most children to learn to read fluently and with comprehension in the home language in the Foundation Phase. At all other levels and for all subjects, this failure then becomes an additional binding constraint that ruins the life chances of millions of children. For that reason, this report has paid considerable attention to recommendations to remedy this situation in early reading, in addition to alleviating the other binding constraints. If the effect of the four binding constraints can be reduced and progress made towards the goal that all children should read fluently and with comprehension at the end of Grade 3, the education system would be well placed to make rapid progress on a broad front.

1 Introduction

There is a large weight of evidence to show that education occupies a preeminent place in South African society. As the site of great historical injustice, the country's schools and universities are seen as central pillars in righting the wrongs of apartheid. Indeed, the right to education was seen as so important to policy-makers at the transition that it was the only 'unqualified' socioeconomic right in the South African Constitution. That is to say that it has been declared 'immediately realisable' and must be prioritised regardless of the State's other budgetary commitments[2]. This prioritisation can be seen in government budgets and policy statements where education is the largest single line item in national and provincial budgets. Yet, notwithstanding the prioritisation of education or the size of these budgets, research has consistently shown that educational outcomes for the poor remain unacceptably low. While there have been some indications of improvements in maths and science at the high school level, nationally representative surveys at the primary school level continue to show that more than half of children are not learning to read for meaning in any language by the end of Grade 4 and almost a third are illiterate. The fact that half of students do not learn to read, and therefore cannot read to learn, creates a low ceiling beyond which it is not possible to progress. This is therefore the primary focus of this report.

The present report is the culmination of 18 months of research exploring how to overcome the implementation challenge in education, defined as the gap between admirable policies and abysmal outcomes. The central focus of this report is on the binding constraints that limit learning in South African schools, specifically learning to read in the Foundation Phase (Grades 1–3). While there are many challenges in the education system, and many legitimate claims on limited resources, the evidence strongly suggests that unless this issue is prioritised and addressed first, other interventions will lead to only marginal improvements. The four binding constraints identified through this research are (1) Weak institutional functionality, (2) Undue union influence, (3) Weak teacher content knowledge and pedagogical skill, (4) Wasted learning time and insufficient opportunity to learn. Before moving on to discuss these four binding constraints, we focus on reading outcomes in the country and explain why this became the central focus of the research.

2 See Skelton, A. 2014. Leveraging funds for school infrastructure. International Journal of Educational Development. Vol 39: Pp59–63

2 An Inadequate Learning Foundation: The National Reading Crisis

The importance of learning to read

The ability to read for meaning and pleasure is arguably the most important skill that children learn in primary school. Since all future learning will depend on this fundamental understanding of the relation between print and spoken language, it is unsurprising that literacy, built upon a firm foundation of basic reading, is used as one of the primary measures of school efficacy.

The South African curriculum (CAPS) identifies learning to read as a central objective of the Foundation Phase. Broadly speaking, the first three years of school are the 'learning to read' phase, while grades four onwards are the 'reading to learn' phase. Unfortunately the vast majority of South African children do not currently learn to read for meaning in primary school.

The national reading crisis

As we will show below, approximately 60% of South African children do not learn to read in any language (including their home languages) by the end of Grade 4. This shaky foundation results in weak learning outcomes in subsequent years. Given that these children are unable to read for meaning they also cannot use the skill of reading to acquiring new knowledge in various subject disciplines. Since English is the dominant language of instruction and learning from Grade 4 onwards in all schools, students with African home languages are particularly disadvantaged. But even in English/Afrikaans schools, only 57% of Grade 5 students could read for meaning.

Analysis on several data sets and international comparisons reveals that South African primary school students are woefully unprepared to learn from Grade 4 onwards. This is the result of insufficient acquisition of the skill of reading for meaning. The burden falls most heavily on those in rural areas and townships as well as children who have an African home language.

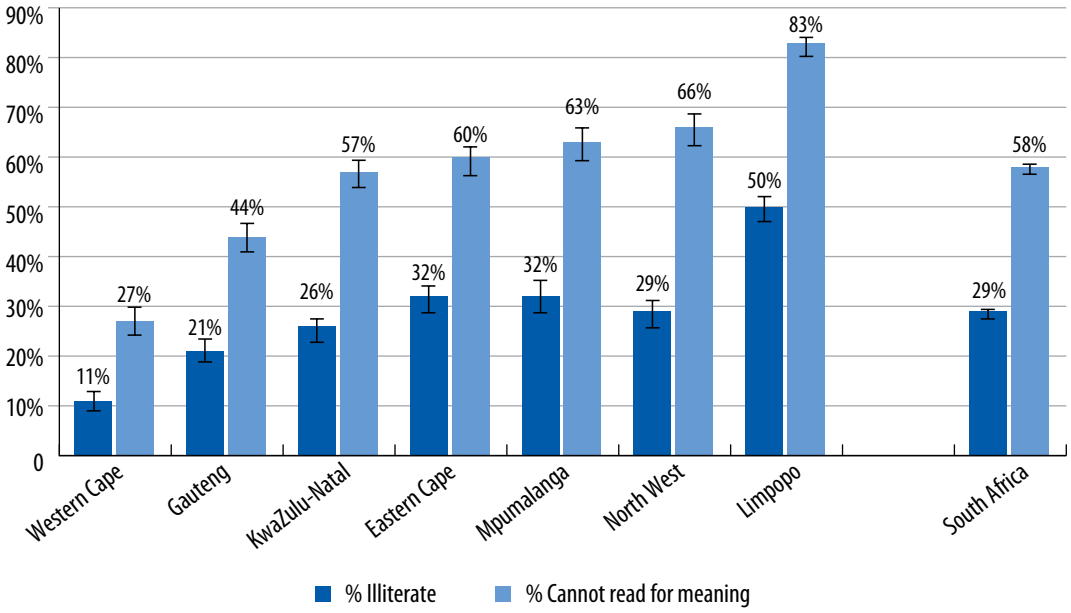
Reading in African languages

According to the 2013 Annual National Assessments (ANAs), approximately 70% of all students in Grades 1–3 were learning in an African language. Due to the 'switch' to English after Grade 3, by Grade 4 most students (90%) were now learning in English as the language of learning and teaching (albeit with widespread code-switching or 'language mixing'). The logic behind this approach is that children find it easier to transition into literacy in a second language if they are first literate in their home language. This view is also supported by recent empirical evidence from South Africa (Taylor & Von Fintel, 2016). The practical difficulty with it is that most children do not learn to read for meaning in an African language (or any language) by the end of Grade 3 (Spaull, 2015). Consequently, they are switching into a second language when they have not in fact become literate in a first (home) language.

The prePIRLS assessment of 2011 deliberately aimed to assess reading literacy in whatever language the school used in Grades 1–3 (and thus mostly the student's home language). It tested 15 744 Grade 4

students in a nationally representative sample of 341 primary schools in all 11 languages[3]. It was found that 58% of the Grade 4 sample could not read for meaning in any language (i.e. the intermediate test benchmark) while 29% were completely illiterate (i.e. were unable to reach the lowest benchmark). These proportions differ dramatically by province (Figure 1). By way of example, in the Western Cape only 11% of students were illiterate and 27% could not read for meaning. In Limpopo 50% were illiterate and 83% could not read for meaning at the end of Grade 4.

Figure 1: *Proportions of Grade 4 students that are (1) illiterate and (2) cannot read for meaning in the Foundation Phase LOLT of the school by province (prePIRLS, 2011)*



Note: Using prePIRLS 2011, 'illiterate' = cannot reach low benchmark; 'cannot read for meaning' = cannot reach intermediate benchmark *(with 95% confidence interval)*. PrePIRLS is not stratified by province and therefore the Free State and the Northern Cape were excluded since they had fewer than 1000 students.

Source: Spaull (2016a)

Reading literacy in English and Afrikaans

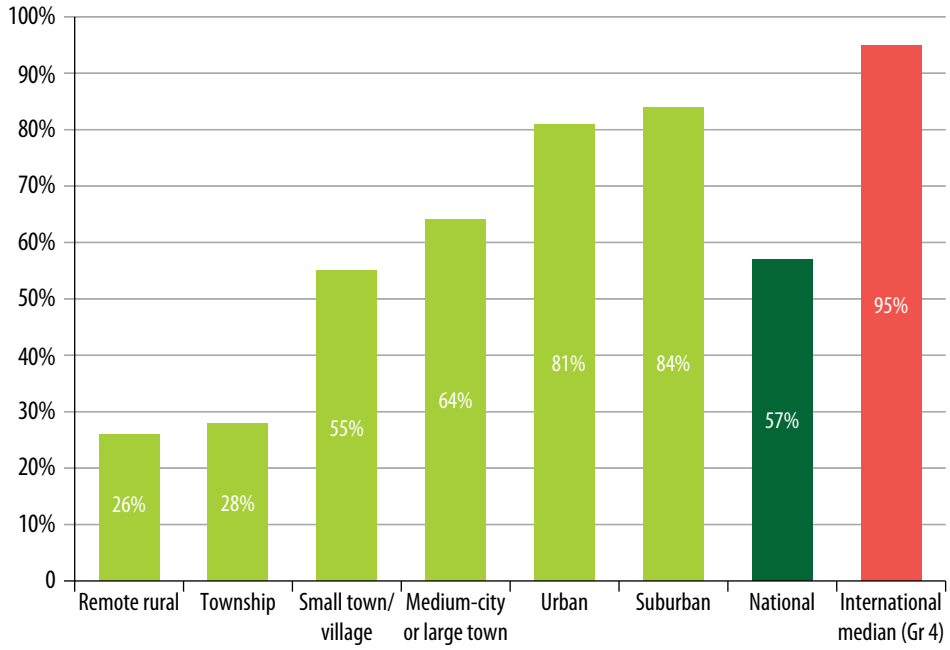
PIRLS 2011 (which is a different assessment to prePIRLS) tested a sample of 3 515 Grade 5 students from 92 schools where the language of learning and teaching (across all grades) was English or Afrikaans. Typically these are better-than-average schools. This test was set at an international Grade 4 level. Nationally, only 57% of the 3 515 Grade 5 students had acquired basic reading skills, compared to 95% of Grade 4 students internationally (Figure 2). Huge variation was observed, however. Amongst the Grade 5 students in urban or suburban schools in South Africa, just over 80% of students had acquired basic reading skills compared to only 26% of students in remote rural areas and 28% in townships.

It is more revealing and useful to quantify how many students had learned to read for meaning (i.e. attained the intermediate international benchmark). The international median for the countries

3 Note: the prePIRLS test is considerably easier than the PIRLS assessment with roughly 400 words per text in prePIRLS rather than 800 words per text in PIRLS.

participating in PIRLS was 80% of Grade 4 students that could read for meaning. In South Africa, only 34% of Grade 5 students at English/Afrikaans schools could read for meaning.

Figure 2: *Proportion of Grade 5 students in English and Afrikaans LOLT schools acquiring basic reading skills by school location (PIRLS, 2011)*



Note: Proportion reaching low international benchmark in PIRLS 2011. South Africa tested 3515 Grade 5 students in 92 schools where English or Afrikaans was Language of Learning and Teaching (LOLT) from Grade 1.

Source: Spaull (2016a)

Reading aloud in English

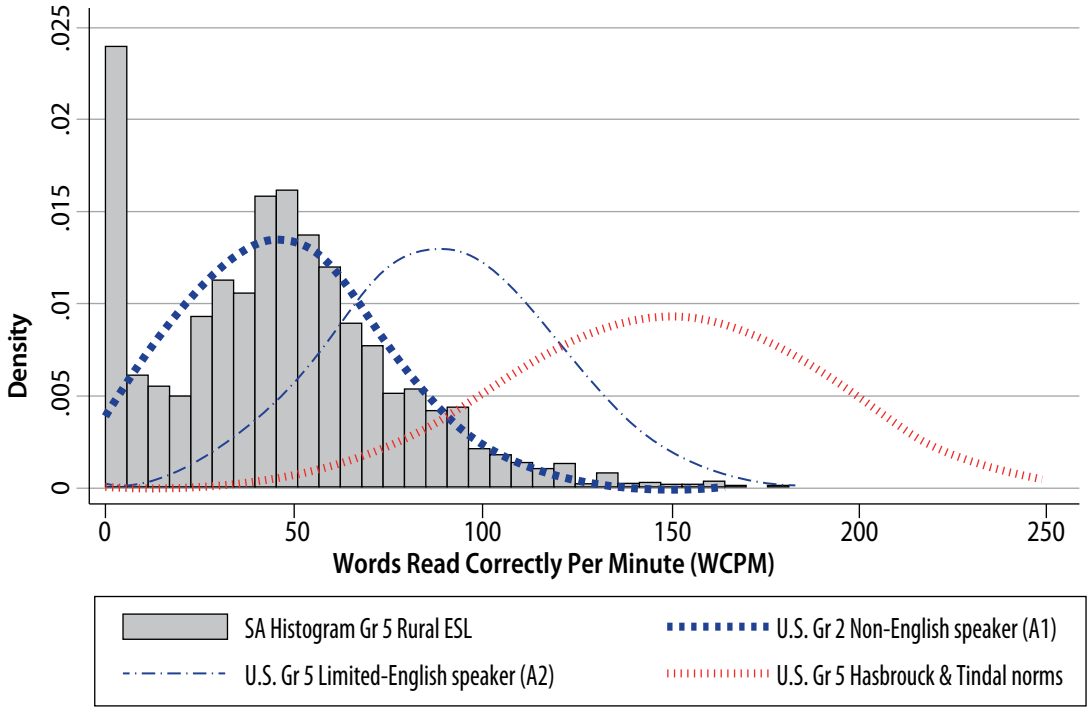
The ability to read aloud with speed, accuracy and expression – what is called 'oral reading fluency' – is one of the building blocks of early reading instruction. Indeed the National Reading Panel of the United States identified fluency as one of the 'Big Five' components of reading accomplishment, together with phonemic awareness, phonics, vocabulary and comprehension.

As part of the present research project a new data set on oral reading fluency collected by the National Education and Evaluation Development Unit (NEEDU) in 2013 was analysed. This survey tested 4 697 Grade 5 students from 214 schools across rural areas in South Africa. A sub-sample of these students – 1 772 students – was selected for an Oral Reading Fluency (ORF) test. Only 6% of the students achieved comprehension scores above 60%. An unacceptably high proportion of the sample (41%) were non-readers or 'illiterate' since they were reading so slowly that they could not understand what they were reading. Sadly, 11% of the sample could not read a single English word from the passage.

In an attempt to set oral reading fluency norms for South Africa (measured in 'total words read correct per minute'), researchers compared second language students in South Africa to different types of second language students in Florida (United States), a state where norms for second-language students specifically already exist.

The research finds that South African Grade 5 second language students from rural areas in South Africa have essentially the same distribution as Grade 1 second language students in Florida, or Grade 2 second language remedial students that have been removed from normal classes because they "cannot communicate meaning orally in English and demonstrate very little understanding in English." This comparison is shown visually below in Figure 3 with four curves: (1) the South African Grade 5 distribution is shown (grey bars), (2) with the Florida Grade 2 remedial second-language distribution (far left blue curve), (3) a tentative benchmark of where South African Grade 5 second-language students should be (the middle blue curve) and (4) American Grade 5 students (all languages) (red curve) (Draper & Spaull, 2015).

Figure 3: *Distribution of oral reading fluency scores (WCPM) for rural South African English Language Students (ESL) relative to Broward County ESL Students (Florida, US)*



Source: Spaull (2016a)

Critical lack of district support to primary schools

It is worth reiterating that at the Grade 5 level in South Africa the entire curriculum is being taught in English for 90% of the student population. If these students cannot read for meaning in English then they cannot engage with the curriculum and are 'silently excluded' for the remainder of their educational career. This speaks to the vital policy need to redirect support and effort to primary schools. The problem of relatively less district support for primary schools (and especially Foundation Phase) compared with secondary schools is a clear problem that emerges from the analysis by Wills (2016b).

It is clear that district resources are being disproportionately targeted towards secondary schools relative to primary schools. This is reflected in principal reports of the intensity of district visits to their schools, which types of district officials visit their schools and what types of activities are carried out during these visits where principal reports are also triangulated using nearly 15 000 teacher responses[4] on their personal experience of subject advisor visits. Figure 4 below shows that FET-phase teachers were considerably more likely to have been visited by a subject/curriculum adviser in 2011 (the year of the survey) as compared to Foundation Phase teachers. While 61% of FET teachers reported at least one visit by a curriculum adviser, only 45% of Foundation Phase teachers did so. This difference is statistically significant.

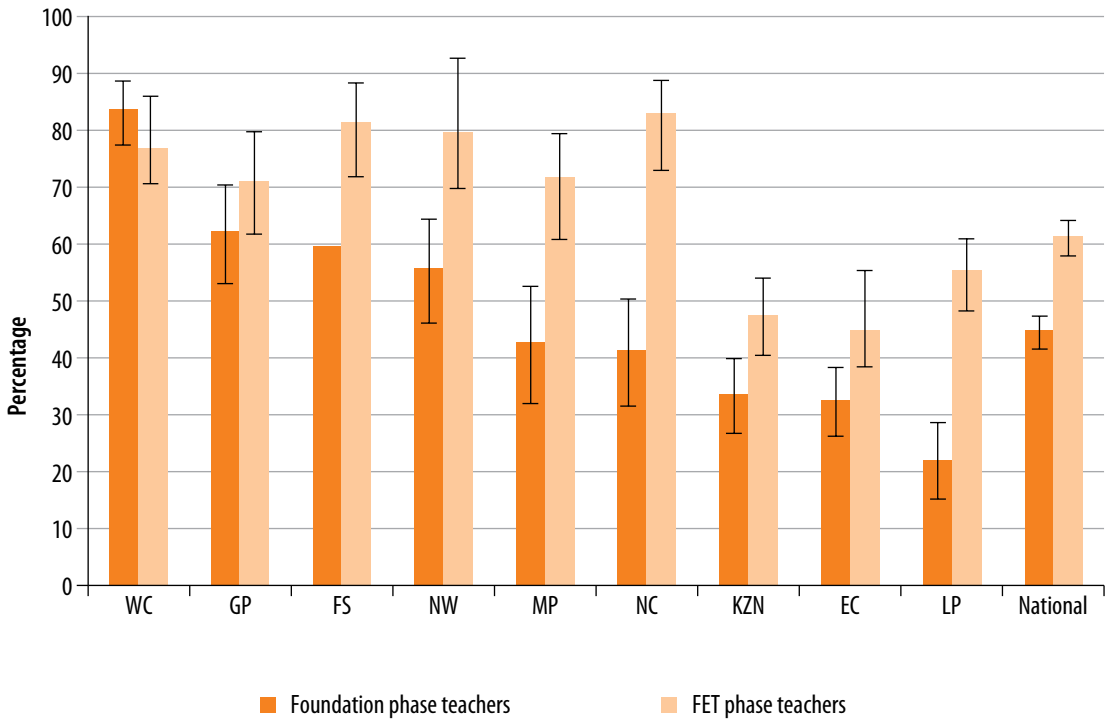
61%

of FET teachers reported at least one visit by a curriculum adviser, only

45%

of Foundation Phase teachers did so

Figure 4: *Percentage of Foundation Phase (Grades 1, 2 and 3) and FET phase (Grades 10, 11 and 12) teachers sampled in the School Monitoring Survey that report they were visited by a subject/curriculum advisor during 2011 by province (with 95% confidence interval)*



4 As part of the School Monitoring Survey of 2011, ten educators per school were selected randomly within the school, or in the case of there being ten or fewer educators all educators were selected. Each educator was asked to complete a five-page questionnaire dealing with professional development and support provided by districts. In total 15,252 educators were surveyed although only 15,004 reported information on subject advisor visits.

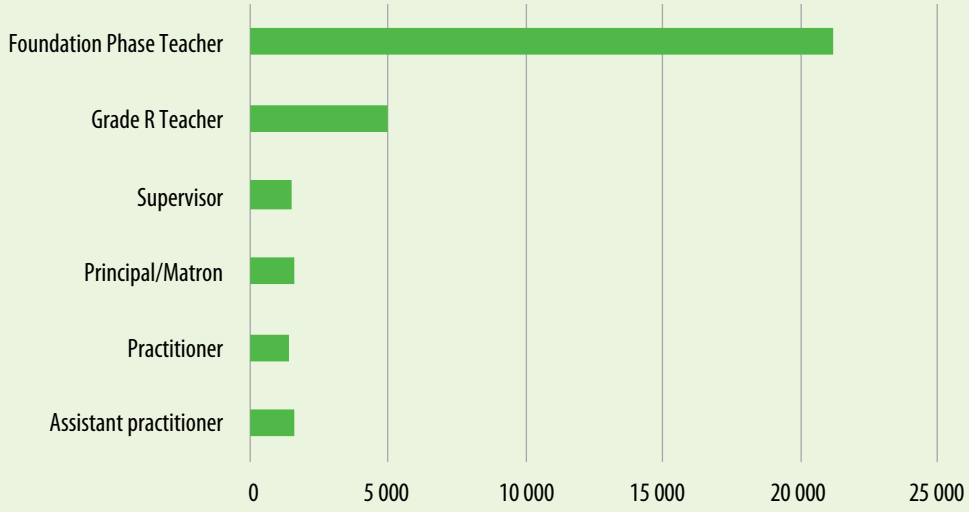
Early Childhood Development

Across all research disciplines there is widespread agreement that investment in Early Childhood Development (ECD) brings high returns and can help close the gap between children from rich and poor households. The National Development Plan (NDP) recognises this, and calls for universal access to two years of early childhood development prior to entering Grade 1. Over the past 10 years, there has been improvement in the general participation of four year olds in ECD programmes, with 64% of four year olds and 81% of five year olds in South Africa attending an education institution in 2013. This suggests that approximately 300 000 four year olds are not attending any early childhood development programmes.

With regards to the supply of ECD programmes, there are four main challenges:

1. **Infrastructural inadequacies linked to low fiscal allocations:** According to the national ECD Audit of 2013, one in five ECD centres has inadequate drinking water supply, one in four has inadequate electricity supply and a quarter struggles with inadequate ablution facilities. Improving these conditions is no easy feat since ECD centres receive only a basic subsidy of R15 a day per child, applying only to children who pass the means test (i.e. are deemed to be poor). This subsidy is intended to cover salaries, infrastructure expenses, equipment acquisitions and two meals a day for each child.
2. **Low levels of qualifications amongst ECD practitioners:** Only 10% of ECD practitioners have a qualification over and above matric, and only 25% have received some training in ECD. Although qualifications are not mandatory for good quality teaching, it is critical to ensure that practitioners are aware of the importance and complexity of both cognitive and non-cognitive stimulation for the development of young children.
3. **Low ECD practitioners' salaries:** On average the monthly salary of an ECD practitioner ranges from R1 400 to R2 000 and does not include any benefits such as pension fund, medical aid or housing subsidy. In comparison, a Foundation Phase teacher earns R 21 141 per month including all benefits, which is more than ten times what the average ECD practitioner earns (Figure 5). This large discrepancy between the salaries of teachers teaching 7 year olds and the salaries of teachers of 6 year olds is a serious matter of concern, as it makes it very unattractive for well qualified practitioners to remain in ECD.
4. **Policy limbo of ECD:** The policy space within which the ECD sector operates is confusing and unclear. The responsibility for ECD is spread over multiple departments and this lends itself to confusion and the abdication of responsibility.

Figure 5: *Comparison of teacher and practitioner salaries (2013)*

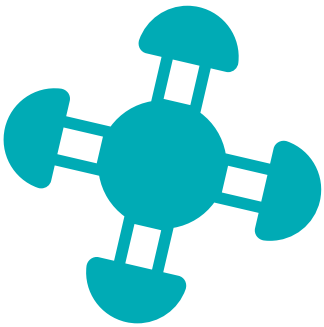


Source: Kotzé (2016)

3 The Need for Prioritisation

Educational outcomes in South Africa's public education system have been noted as highly variable, generally inadequate and vastly insufficient to meet the needs of a labour market located in an industrialising, service-based economy. In the past, the Department of Basic Education (DBE) has attempted to address the multiple limitations[5] of a widely dysfunctional system through a comprehensive approach. Areas that are critical to improvement have been given only slightly more attention and resources than those which are marginal by comparison. As a result of limited resources, time and management ability to focus on specific interventions, this has delivered significantly less benefit than initially anticipated. The end result is compromised critical learning outcomes, such as developing the ability to read.

This research project takes as its point of departure that not all constraints in education bind equally and consequently that there is a need to prioritise. A strong case can be made that radical prioritisation is the most promising path to improvement in South Africa. This is in accordance with the principal policy and planning document of the Republic – the National Development Plan – which argues that "... senior public officials should focus most of their attention on a few strategic priorities" (RSA, 2012, p. 59). It is argued that the end-point of such a process of prioritisation is focusing on developing the skill of reading in primary school. Why is prioritisation so important? One answer to this question is that both constraints and solutions have a hierarchy. There are certain things that must be tackled first if there is to progress in any area. A further justification for prioritising would be that it is often impossible for governments to focus well on many interventions at once. It is better to do a few things well than tackle a wide range of things and obtain mediocre results.



Senior public officials should focus most of their attention on a few strategic priorities

5 A cursory overview of the South African literature highlights the full gamut of problems, including (1) poor teacher content knowledge, (2) low curriculum coverage, (3) text-deprived learning environments, (4) low cognitive demand, (5) low accountability, (6) inadequate district support, (7) high teacher absenteeism, (8) English proficiency deficits among primary teachers, (9) weak administration and management at all levels, (10) weak evaluation and assessment, (11) high dropout in upper high-school, (12) high grade repetition, (13) low parental involvement, (14) language of learning and teaching difficulties, (15) ineffectual school governing bodies, (16) ineffective in-service teacher training, and (17) infrastructure backlogs (see Taylor *et al.*, 2003; Christie *et al.*, 2003; Fiske & Ladd, 2006; Fleisch, 2008; Hoadley, 2010; Van der Berg *et al.*, 2011; RSA, 2012; RSA, 2013 for overviews)

Absence of key priorities

Although more recent policy documents have begun to identify priorities, they are intangible, immeasurable and frequently incorporate three or four areas into one 'priority'. For example, one of five 'priority goals' in the Action Plan to 2014 is to "*Improve the professionalism, teaching skills, subject knowledge and computer literacy of teachers throughout their careers*" (Goal 16). This goal is vague and multifaceted, making it difficult to operationalise or measure. The central objective of prioritisation is to justify allocating more resources and time to some projects and less to others, something that can only be done if the Department is explicit about which areas are the core priorities of government and which are not. This lack of explicit prioritisation is also identified in the Action Plan to 2019. Commenting on the report of a joint initiative between the DBE and private sector partners – one that interviewed 300 people working at all levels of the schooling system – the Action Plan explains that:

Every child in South Africa must learn to read for meaning by the end of Grade 3

"The limited capacity of managers and planners to prioritise represents a further fundamental problem…Too many priorities, each linked to complex reporting procedures, are likely to overload the system. As demonstrated by the current plan, and the technical documentation that accompanies it, getting just one indicator right can involve considerable technical work. Clearly, indicators need to be chosen carefully and the number of indicators needs to be limited" (DBE, 2015: p19).

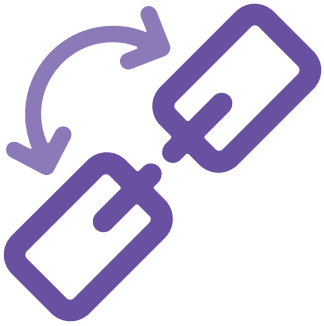
In this report it is argued that the central priority of the Department of Basic Education should be the following: "**Every child in South Africa must learn to read for meaning by the end of Grade 3**." This goal is measurable, realisable and easy to understand, both by parents and policy-makers. Since almost all future learning will depend on this fundamental understanding of the relation between print and spoken language, this is arguably the most important skill that children learn in primary school. Failure to achieve this outcome makes it highly unlikely for many children that they will ever be able to achieve strong cognitive skills at higher grades, given their weak foundations. Unfortunately, as can be seen above, most (58%) of South African children still cannot read for meaning in any language by the end of Grade 4 (age 10 to 11).

The primary policy document in education – the Action Plan to 2019 – lists 27 goals and 5 priority goals. Reading is never mentioned explicitly amongst the goals but presumably falls into the goal to "*Increase the number of learners in Grade 3 who, by the end of the year, have mastered the minimum language and numeracy competencies for Grade 3*."

Unfortunately this is not one of the five priority goals, despite widespread acceptance that the absence of reading skill is both a critical weakness in South Africa and an essential precondition for further learning. In fact a reading goal such as "reading by age 9" or "reading by the end of grade 3" is evidently compatible with both the DBE's policy documents and those of the government more generally (notably the education chapter of the National Development Plan and the Presidency's Medium Term Strategic Framework, MTSF).

In this report we look at the evidence on educational constraints in South Africa with the aim of identifying the most 'binding constraints' to improving education quality for the poor. For present purposes a binding constraint is defined as one that, if not addressed first, prevents sustained improvement in all areas. If one thinks of creating a hierarchy of problems and ordering constraints from smallest to largest, the binding constraint would be the most serious constraint. The argument proceeds that addressing constraints that are not the *binding* constraint leads to wasted resources and no improvement in outcomes.

A **binding constraint** is defined as one that, if not addressed first, prevents sustained improvement in all areas



The teacher's role in successful learning

A high-level overview of the research presented here shows that the success or failure of the education system in South Africa hinges on one factor broadly defined: teachers. Irrespective of whether one takes a top-down approach (provinces and the 'Administrative Core') or a bottom-up approach (classrooms and the 'Instructional Core'), the conclusion is the same: the battle for improved education for the poor is won or lost on the appointment, allocation, training, supervision, competence and behaviour of teachers. For this to improve, certain specific outcomes need to be prioritised across the board. These should be realised by following a twinned process of simultaneously increasing the capacity of provinces and teachers and increasing accountability for learning in the classroom and the post-provisioning process in the poorest provinces.

4 The Binding Constraints Approach

Sizing the challenges

The binding constraints approach essentially argues that some problems are so severe that, unless they are solved first, no amount of money or time spent solving the less severe problems will help. Hausmann *et al.* (2008, p. 17) distinguish between a *binding-constrants* approach and an *all-constraints-bind-equally* approach. To illustrate their point, an 'all constraints bind equally' view would hold that any constraint in the system had a similarly limiting effect. For example an absence of a science laboratory would negatively affect learning as much as dysyfunctional school leadership. This is neither intuitively correct nor empirically supported. By constrast, the 'binding constraints' approach maintains that there are some critical educational inputs or factors without which learning cannot effectively take place. Intuitively, examples would include adequately skilled teachers and basic learning materials.

This approach is useful because it makes the prioritisation process explicit and so recognises the trade-offs present in a particular environment or context. When faced with limited human, physical, and organisational (or system) resources with which to address many challenges, one is forced to sequence the programme of intervention by choosing which problems to tackle first, or more specifically which problems to devote most resources towards and at different points in time. Critically this also involves *not* allocating resources to other, sometimes legitimate, needs. Doing so is not possible without an evidence-based hierarchy of problems, upon which consensus can be sought amongst among various interest groups. Without prioritisation, resources are spread too thinly and there is no meaningful progress as a result. Or alternatively interest groups that do not benefit from the prioritisation and do not agree with or understand the prioritisation can undermine the system.

People should be supported to accomplish that for which they will be held accountable

The research presented in this report and the background papers undertaken for this project aim to summarize the existing research literature and provide new evidence where it was lacking. The aim here is to provide a realistic, evidence-based hierarchy of problems that need to be solved in education in South Africa.

Accountability and support as central drivers

Prior to identifying the binding constraints on school education, and what can be done to address these, it is important to note that while the root causes of South Africa's low educational outcomes are multifaceted, generally they fall into one of two categories: (1) a lack of accountability, and (2) a lack of capacity or support[6] and also a lack of alignment between these two categories. By alignment it is meant that people should be held accountable for

6 See Hoadley (2016), Spaull (2015) and Fleisch (2008).

things they can reasonably be expected to do, or stated another way people should be supported to accomplish that for which they will be held accountable. If Foundation Phase teachers are to be held accountable for whether their students acquire foundational reading skills, this is the specific area for which support should be provided and also the specific outcome that should be measured. It is no good to provide capacity to do one thing and then to hold people accountable for something else.

A lack of accountability

In South Africa there is a widespread perception that the national, provincial and local levels of government are not held accountable for how they use public resources. As democratically elected representatives of the people, officials at each of these levels have a constitutional mandate to use tax revenues and other state resources to provide certain public services to South Africans. Often, however, these resources are not converted into public services for reasons that range from poor administration to corruption. In too many instances the over-arching criteria for who receives a promotion is patronage rather than performance (NEEDU, 2013).

In too many instances the over-arching criteria for who receives a promotion is patronage rather than performance

Furthermore, given that there are few (if any) tangible consequences for non-performance, there now exists a cycle of poor service-delivery, weak accountability and low expectations. This lack of accountability and service-delivery is especially acute in the basic education sector in South Africa and can be seen all the way from provincial offices down to schools and classrooms. Indeed one of the ten 'critical actions' outlined in the NDP is the creation of an 'education accountability chain', because "education outcomes cannot improve unless accountability is reinforced throughout the system, from learner results to the delivery of textbooks" (RSA, 2012, p. 55).

A lack of meaningful support

Although the Department of Basic Education (DBE) and Provincial Education Departments have implemented a plethora of strategies to support teachers and principals, there is little or no sense of what is actually working or why. In fact, given that almost none of these programmes have undergone rigorous, independent, quantitative evaluation, there is no firm evidence that any of them are working at all. Beyond quantitative evidence extremely few of these interventions have even gone through the less costly process of a basic qualitative evaluation, comprising user feedback and expert opinion on materials used and programme delivery. Even simple independent evaluations should be able to weed out the clearly sub-standard, ineffective programs.

This is further complicated since there are numerous competing models of support. For example if one just looks at Foundation Phase reading, the National Education Collaboration Trust (NECT) – a business-government initiative – appears to favour traditional models of trickle-down teacher training workshops, whereas the Western Cape LitNum strategy runs more in-depth in-service training courses

(one focusing on teaching reading) through the Cape Teaching and Leadership Institute (CTLI) (De Chaisemartin, 2010). Gauteng has experimented with providing additional graded readers, clearly scripted lesson plans, and employing specialist reading coaches who visit teachers on a monthly basis to observe lessons and offer assistance. Many provinces have privately-funded programmes with hundreds of different aims and methodologies.

Currently there is no systematic assessment of, or information on, which of these interventions work, and if they do, which is best. This limits the ability to select the most effective interventions to implement more broadly within the system.

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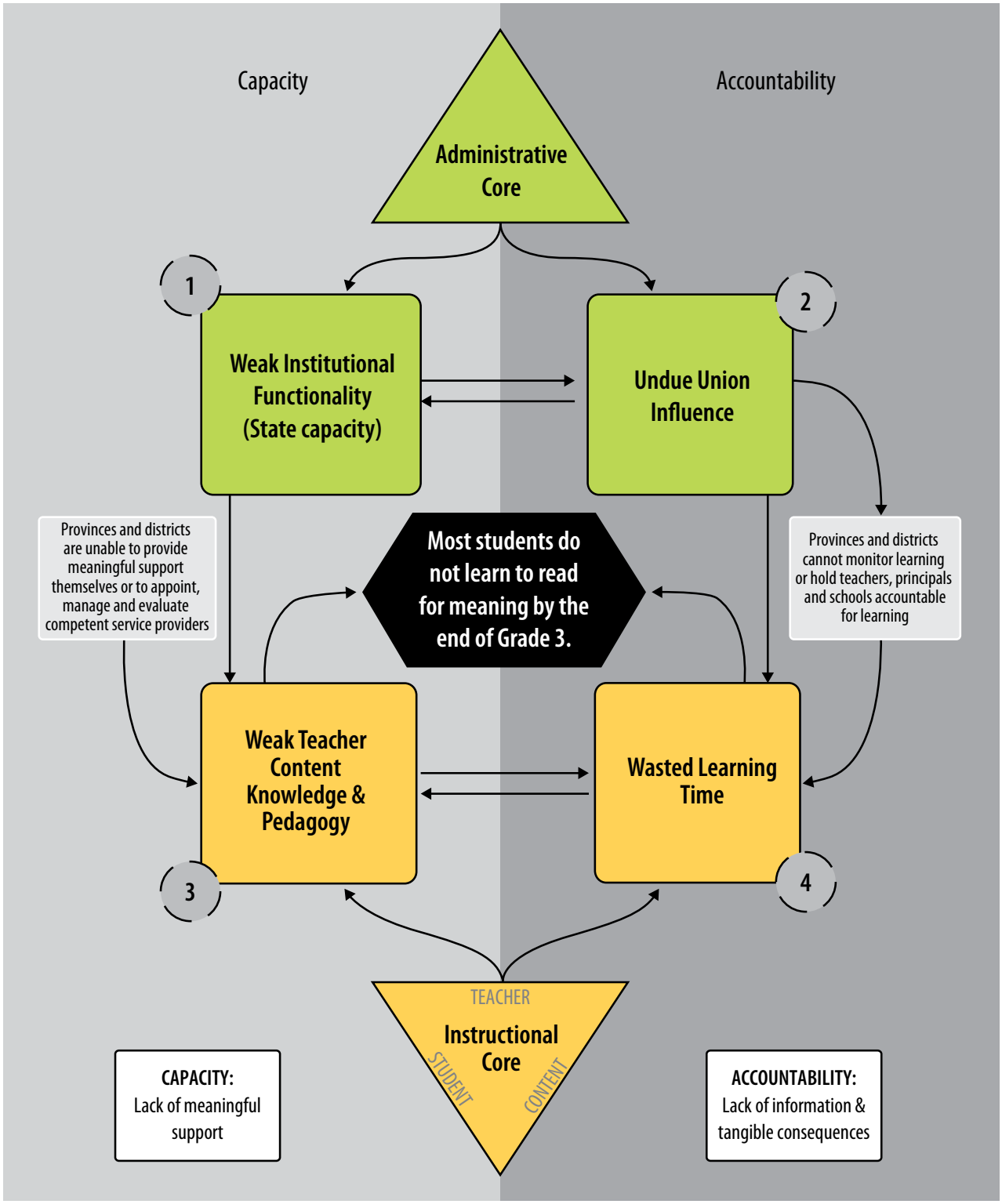
In addition to the above there is currently no convincing *theory of change* in use in South African education; that is an explication of what principals and teachers need to do differently to improve. This is especially obvious and problematic in the case of mathematics and reading teachers with weak content knowledge. How should a primary school mathematics or reading teacher resolve the problem of lacking competence in the curriculum which they themselves are teaching[7]? Teacher support is far from adequate in most of the public education system. Provision of *ad hoc* weekend workshops or study sessions is not adequate for the development of real content knowledge, particularly in applied disciplines such as reading and mathematics.

Identifying the four binding constraints

After a comprehensive review of the literature and conducting new research on areas where the literature was lacking, the research team consistently returned to the following four binding constraints: (1) weak institutional functionality, (2) undue union influence, (3) weak teacher content knowledge and pedagogical skill, and (4) wasted learning time. One can think of the first two being a function of a weak 'Administrative Core' and the latter two as being a function of a weak 'Instructional Core'. The Instructional Core refers to the "actual interaction between teachers, students, and content in the classroom" (City *et al.*, 2009). Both these cores in South Africa are beset by serious capacity and accountability constraints. This dynamic between the Administrative and Instructional cores, together with the interaction of accountability and capacity at both levels, is depicted graphically in Figure 6 below. There are a large number of candidate constraints, ranging from infrastructure at the school level to curriculum content at universities. However, through a scenario analysis, the research team realised that in many instance these problems have their roots in one of the binding constraints. For example, insufficient infrastructure budgets are largely driven by unsustainable post-provisioning processes in some provinces and this in turn is a function of undue union influence, i.e. binding constraint 2.

7 Teachers may lack competence even when their qualifications are deemed appropriate – see Venkat & Spaull (2015).

Figure 6: *Dynamic interaction between the binding constraints*



Source: Own conceptualisation for PSPPD project.

Most teachers teach

50%

of the lessons they are scheduled to teach in the year

Low accountability and capacity interact to weaken the cores

The arrows running between constraints (1) and (2) as well as between (3) and (4) in the figure indicate the bi-directional causality between these constraints. Because there are low levels of state capacity, particularly in certain provinces (constraint 1), there is ample opportunity for special interest groups to capture the State for their own ends. This leads to undue union influence (constraint 2). The reverse is also true: where a province does not have control over the selection and appointment of key officials (due to undue union influence), it is unable to rectify a situation of low state capacity. This leads to a low-level equilibrium or stale-mate where any move to change either of these factors is prevented by the presence of the other.

A similar situation can be seen at the classroom level where there are simultaneously huge capacity *and* accountability deficits. Thousands of teachers with 'appropriate qualifications' lack the content knowledge or pedagogical skill to teach the curriculum at even the most basic level[8]. It is unsurprising then that the most rigorous reviews of opportunity to learn in South African primary schools (Taylor, Mabogoane and Van der Berg, 2013; Carnoy, Chisholm & Chilisa, 2012) show that most teachers teach about 50% of the lessons they are scheduled to teach in the year. The interaction between (3) and (4) reflects how a teacher that lacks confidence in one area of the curriculum might choose not to teach that area. Since curriculum coverage is not monitored by districts, there is no incentive for teachers to acquire the skills they currently lack.

A weak Administrative Core undermines the Instructional Core

The two arrows running from (1) to (3) and from (2) to (4) show how a dysfunctional Administrative Core contributes towards an underperforming Instructional Core. For instance, a weak state that has appointed curriculum advisers on a basis other than merit lacks the human resources to provide meaningful support to its teachers. Administrative failure also includes human resources officers, EMIS officials, management support officials, special needs officials, etc. Similarly a province with administrators whose allegiance is primarily to a teacher union rather than the Department of Basic Education cannot find the budget for large-scale meaningful support since doing so would require

8 It is important to note that these teachers have not been given meaningful learning opportunities pre- or post-apartheid.

significant resources. These resources are not available partly due to an unaccountable post-provisioning process. Thus they cannot afford to appoint a service provider or cannot independently appoint the best service provider, or monitor and evaluate the performance of the provider with tangible consequences for non-performance.

At a practical level, in many provinces the overarching theme in the selection and appointment of teachers and principals, as well as in daily operations, seems to be to one of patronage. In commenting on the Volmink Report, the Minister of Basic Education has stated that:

"The report indicated that in the majority of provinces some Unions run, and to an extent appear to control Government for selfish reasons which don't benefit learners or the country" (Motshekga, 2015). In such an environment teacher performance and curriculum coverage cannot be effectively tracked and managed. In this case, any attempts to hold teachers accountable for their performance are actively resisted by the majority union.

Linkages from binding to other constraints

Although there are a multitude of other constraints, the researchers regularly found that those other constraints boiled down to one of these four factors. In provinces such as the Eastern Cape and Limpopo, the teacher wage-bill has swelled to such an extent that in these provinces the ability to spend on non-personnel items like textbooks, infrastructure and teacher training has been seriously compromised. The education departments in these provinces are seen, by both teachers and officials, first and foremost as a source of employment for teachers (because of undue union influence), to the detriment of students and learning outcomes.

Resourcing deficiencies such as a lack of physical infrastructure, a lack of textbooks or insufficient curriculum advisors are all driven by insufficient state capacity, which is itself a function of undue union and political influence in the appointment and promotion of personnel. This is manifest in a post-provisioning process that has spun out of control. The Deloitte Report on post-provisioning (Deloitte, UNICED & DBE, 2013) has shown that whereas Gauteng begins its post-provisioning process with the budget and decides how many teachers it can employ, Limpopo and the Eastern Cape begin with the number of teachers that are *currently* employed and then find a way to make that budget available, without regard to the impact of the size of the teacher wage bill on non-personnel items.

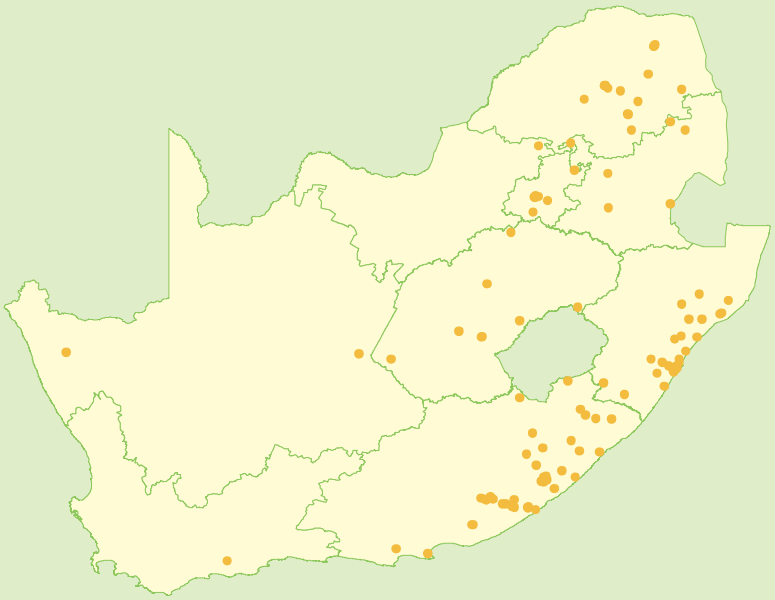
"The report indicated that in the majority of provinces some Unions run, and to an extent appear to control Government for selfish reasons which don't benefit learners or the country"

(Motshekga, 2015)

How many small schools could be closed?

If one uses some fairly uncontroversial assumptions around optimal minimum distances between schools and the degree to which multi-grade teaching in schools will be accepted, it is possible to model how many schools should be closed without leaving learners without sufficiently nearby schools. It was found that over 5,000 schools were of a small enough size to require multi-grade teaching in 2013, but that only around 100 of these schools could be closed on the basis of their distance from other schools, in other words that students would not have to walk more than 3km from home to school (Gustafsson 2016). The figure of 100 schools is obviously sensitive to assumptions and the method used, yet the conclusion seems supported that multi-grade teaching must be accepted as a reality in many thousands of schools over the longer term. In fact, in a context of urbanisation, where populations in rural areas decline, but never reach zero (because there are always some people left behind), one should expect an increase in the number of schools small enough that multi-grade teaching is required (though learners in these schools should decline as a percentage of all enrolments).

Figure 7: *Location of schools which could be closed*



Trends with regard to small schools in recent years have been complex, and somewhat unexpected. The number of schools requiring multi-grade teaching, because their enrolments fall below critical thresholds, has in fact decreased. This is probably because of the closure of many small schools over the 1999 to 2013 period. At the same time, enrolments in these schools as a percentage of all learners in the country has increased. The percentage of all grades 1 to 7 learners in schools so small that multi-grade teaching was required increased from 7.2% in 2007 to 8.9% in 2013.

Closing small schools does not bring major budgetary savings. Relying less on small schools, which have exceptionally low learner/educator ratios, does bring about some saving but this saving is tiny. Specifically, a model was run with two scenarios, both with the same total enrolment and the same L/E ratios per school size. The only difference was that in one scenario small schools played a larger role. The school size distributions followed the actual pattern in 1999, and the actual pattern in 2013, by which time the country had become more urbanised. The 2013-like scenario was found to cost just 0.6% less than the 1999-like scenario, with respect to educator costs.

5 Binding Constraint #1: Weak Institutional Functionality

Importance of a functional state

The principal planning document which aims to guide South African public policy is the National Development Plan (NDP) produced in 2012. One point that is repeatedly made throughout the NDP is that a functional and capable state is fundamental to the realisation of all the socio-economic goals in the Plan. Given the decentralisation of educational powers to provinces in South Africa, and consequently that policy implementation is largely a provincial competency, it stresses that the quality of provincial and local governance is uneven and too often of an unacceptably low standard (RSA, 2012, p. 408).

A functional and capable state is fundamental to the realisation of all the socio-economic goals in the National Development Plan (NDP)

Challenges in measurement

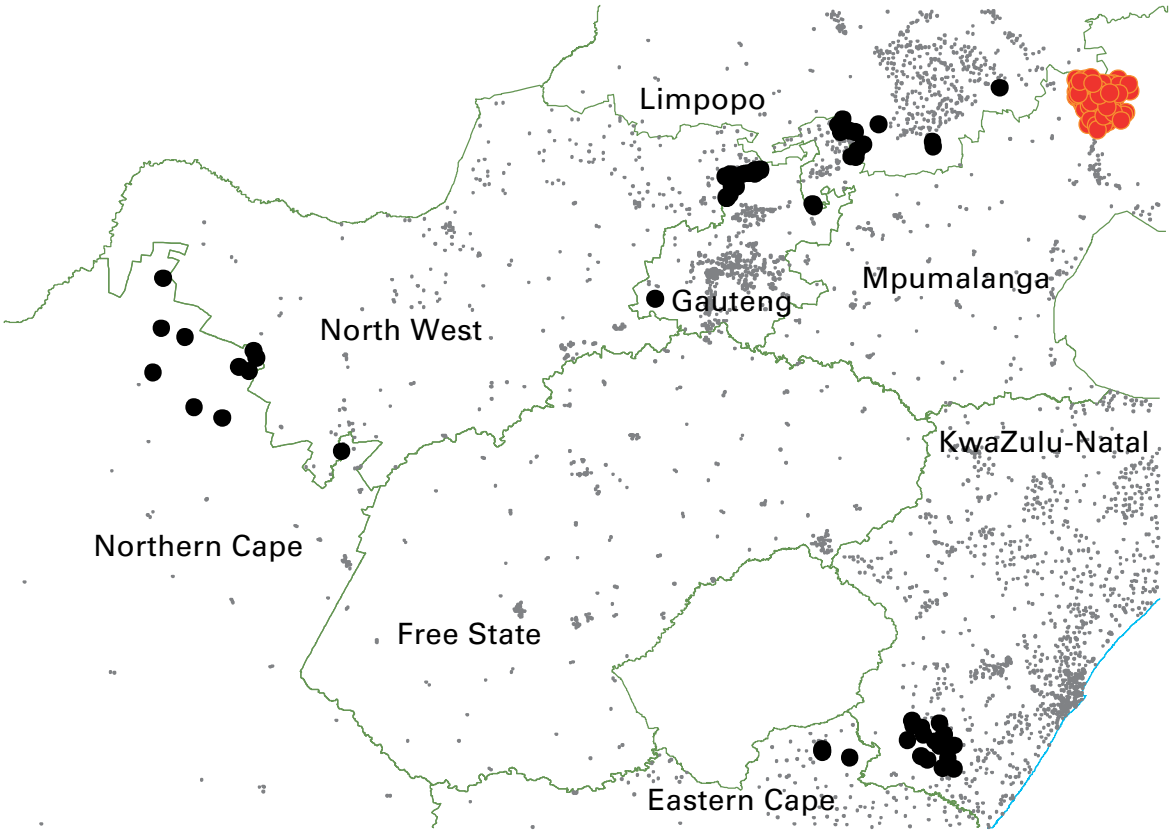
Quantifying the educational impact of the level of functionality within an administration is difficult due to the absence of a counterfactual (what would the alternative look like). To comprehensively and accurately measure the impact of administration on educational outcomes, one would need to relocate a school and its community from a province with a weakly performing Administrative Core, such as the Eastern Cape, to another province with a strongly performing Administrative Core, such as Gauteng, and then assess the level of improvement[9]. Of course, this is not possible.

However, due to an unusual administrative change in 2005, some schools were reallocated to different provinces. This was due to the change of provincial boundaries to ensure that no municipality straddled two provinces. As a result of the re-drawing of the provincial boundaries 158 high schools were effectively placed under new administrations. This presented a unique opportunity to measure the effect of the functionality of provincial administration on schooling, holding all other factors constant. For example, 29 schools 'moved' from the North West (a traditionally underperforming province) into Gauteng (a traditionally better performing province).

9 Gauteng is widely regarded as a more capable province than the Eastern Cape

Figure 8 below shows the schools that experienced a boundary shift. Schools which moved from a neighbouring province are marked by large points (schools which moved from Limpopo to Mpumalanga are represented by large red points, to distinguish those that moved the other direction, from Mpumalanga to Limpopo) (Gustafsson & Taylor, 2016).

Figure 8: *Schools experiencing a province change in 2005*



Personnel salary contracts as a potential driver of educational outcomes

As part of the present research project two researchers (Gustafsson & Taylor, 2016) analysed the matric results of these 158 high schools and quantified the impact of changing provincial administrations. The results arising from this innovative and important research are especially relevant in the South African context where it is widely believed that a large share of student underperformance in provinces such as the Eastern Cape and Limpopo are driven by dysfunctional administrations. The following quote from Gustafsson and Taylor (2016, p. 1) summarises their findings:

"Movement into a better performing province was associated with large student performance improvements, equal in magnitude to around a year's worth of progress in a fast improving country[10]. Improvements were not always immediate, however, and the data seem to

10 The authors describe a fast improving country as one displaying relatively large improvements in its average score on international standardized tests. Brazil's 2000 to 2009 improvements are cited as an example.

confirm that substantial gains are only achieved after several years, after students have been exposed to many grades of better teaching. The institutional factors which might explain the improvements are discussed…

What did seem to matter was more efficient use of non-personnel funds by the authorities, with a special focus on educational materials, the brokering of pacts between stakeholders, including teacher unions, schools and communities, and better monitoring and support by the district office. Moreover, the education department in one province in question, Gauteng, has for many years pursued an approach which is unusual in the South African context, of hiring a substantial number of senior managers within the bureaucracy on fixed term contracts, as opposed to on a permanent basis, the aim being to improve accountability and flexibility at the senior management level."

To elaborate on the last point mentioned here, Gustafsson and Taylor analyse the national salary payment database (Persal) and find that in 8 of the 9 provinces the vast majority (90%) of the top-paid 100 public servants were employed on a permanent basis. However, in Gauteng this percentage dropped from 95% in 2005 to 60% in 2014, as a result of moving to a system of fixed-term contracts.

Many of the recommendations provided in this report require a basic level of administrative functionality which is sorely lacking in South Africa's poorest provinces. In order for the national and provincial education departments to rectify some of the binding constraints, they will need to appoint government officials based purely on observable and verifiable merit.

Of the top-paid 100 public servants in the Gauteng Department of Education, 95% were on a permanent contract in 2005. This dropped to 60% in 2014 as more people were appointed on fixed-term contracts.

6 Binding Constraint #2: Undue Union Influence

Internationally there is increasing consensus that encouraging higher levels of autonomy and accountability within education systems is necessary for educational improvements (Bruns *et al.*, 2011). Although much research effort is focused on the benefits of *school* level independence and autonomy for educational improvement, the extent to which various tiers of a public education system can act without undue influence from outside actors is also critical. Acting without undue influence here refera to education officials being able to engage in their *civil* functions – including policy design, budgeting, planning, human resource management and monitoring and evaluation – without political or union influences compromising their actions and efficacy in these areas.

In the South African context, there is concern expressed among academics, practitioners, and the public at large that the influence exerted by trade unions, specifically the majority union SADTU, is interfering with the ability of the system to act in the best interests of children[11]. This in turn undermines efforts to implement higher levels of accountability and compromises capabilities in the sector. In the following discussion we briefly discuss the context behind the political interference reflected in trade union agendas, and then identify the impacts of compromised autonomy for weakened accountability and capacity.

Using the Labour Force Surveys between 2000 and 2007 determined that roughly

76%

of teachers in South Africa are union members.

The context behind undue trade union influence

There is a general belief that one of the reasons for the undue influence of trade unions on the system is very high levels of teacher unionisation in South Africa. However, Wills (2016a) notes that while levels of unionisation in South Africa are high, they are

11 This stands in direct contrast to the aspirations of the National Development Plan which envisages a public service that is "immersed in the development agenda but insulated from undue political interference (RSA, 2012, p. 407)" and as a first priority for building a capable and developmental state identifies the need to "stabilise the political-administrative interface". Particularly relevant to the education sector at various tiers is the need to "Build a professional public service that serves government, but is ***sufficiently autonomous*** to be insulated from political patronage. This requires a clearer separation between the roles of the political principal and the administrative head (RSA, 2012, p. 410)."

not uniquely high when compared with some other education systems (Alvarez *et al.*, 2007). Roughly two thirds of all education sector workers (including administrators, management, support staff and privately employed personnel in schools in addition to teachers) are formally identified as members of a teacher union in South Africa. If one limits the national teacher union membership estimate to only teachers this estimate is likely to be higher. Armstrong (2014, p. 4) using the Labour Force Surveys between 2000 and 2007 determined that roughly 76 percent of teachers in South Africa are union members.

Although the extent of unionisation in the sector informs the power that trade unions exert on the schooling environment, a stronger contributing factor to the extent of their power relates to the *structure* of union membership in the education system.[12] Three factors apply: (i) the level of competition amongst unions in the system, (ii) their partisan links and (iii) the level of decentralisation of the trade union in its operations (Murillo, 1999). The stronger the concentration of union members in one union, the more politically aligned they are with the ruling party and the more decentralised the union in its operations, the stronger the power they wield. This is augmented where weak leadership, systems and processes at various tiers of the system create a foothold for union control.

The stronger the concentration of union members in one union, the more politically aligned they are with the ruling party

All three ingredients for trade union power are present in South Africa: the country has a dominant union in SADTU that is politically aligned to the ruling party, historically developed out of a political struggle movement (rather than a professional movement), and is represented at all levels of the system through its shop-steward model. The result is an overly politicised education system where the effect of politics and politicking is not contained to the national policy level but affects day-to-day decision making and operations at district and school levels. As expressed by Carnoy *et al.* (2012, p. 32):

"The loyalty granted to the ANC by SADTU under the anti-apartheid struggle generates a complex web of obligations that impacts education policy today. The question is thus to what extent SADTU serves to perpetuate a highly politicised schooling environment, in which teachers perceive their sense of political unity as equal to their sense of duty as

12 As identified by Murillo (1999) in the context of Mexico and Argentina, even though levels of teacher unionisation and the policy environment under contestation were similar across the two countries, the manner in which union control played out within national school systems was very different. This is attributed to differences in union membership structure.

educators, and where government education policy is constrained by the pursuit of SADTU objectives, which may not always directly align with the interest of students."

However, the extent to which SADTU exerts influence on the system is likely to differ considerably at the provincial level, where membership rates and choice of teacher union differ markedly across provinces, as shown in Figure 9[13].

Calculating rates of teacher union membership in South Africa

Calculations of 'teacher' union membership in South Africa have typically relied on figures from the Public Services Co-ordinating Bargaining Council (PSCBC). However, some studies have erroneously attributed union membership figures reported by the PSCBC as referring to *teachers* only, even though non-teachers in the education sector are also included in these figures. South African trade unions attract teachers in the public and private sector and other workers in the education sector to their membership base. If this is not recognised, over-inflated estimates of teacher unionisation as high as 90% are produced in some studies. It is only possible to infer from the PSCBC figures what union membership rates are in the education sector as a whole: in this case 66% in 2012. Where specifically teacher union membership rates are required, representative survey data on teachers or payroll data provide a better sense of unionisation amongst public sector teachers.

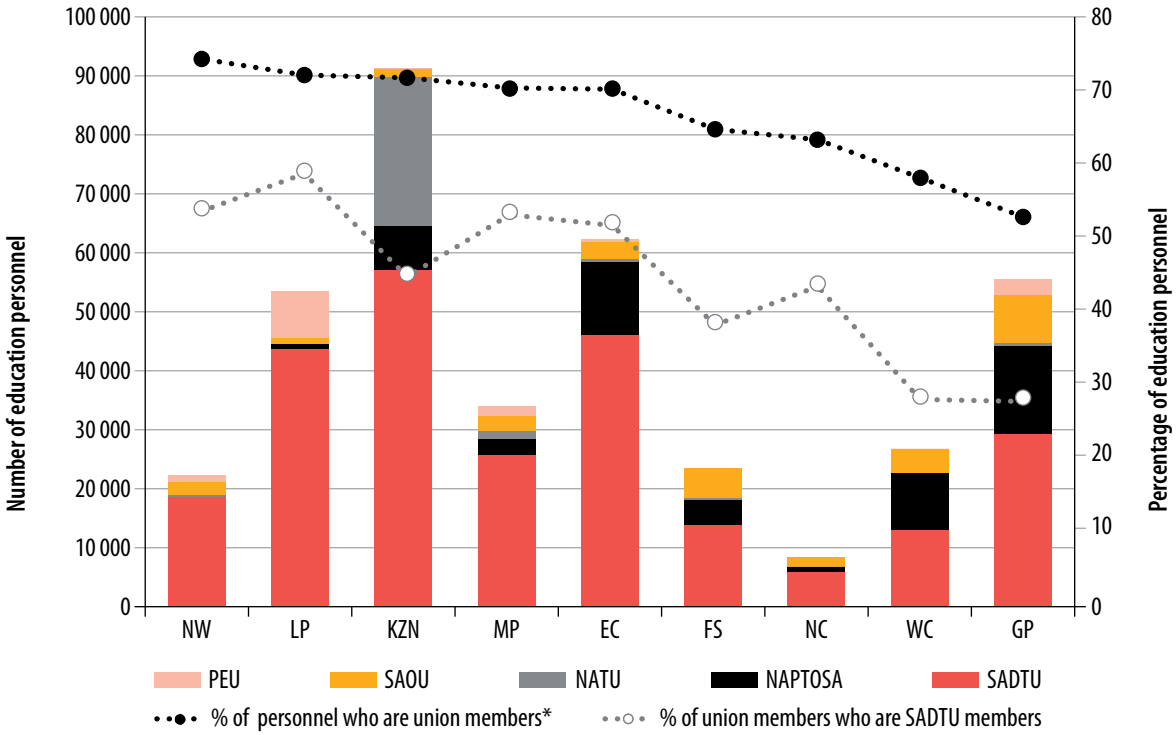
Diminished autonomy for decision-making and independence in appointments manifests in reduced accountability and capacity in the system, and diminished levels of citizen trust in the public education sector

In various international contexts, the extent to which politically organised interest groups and trade unions can exert control over education systems, and the level of conflict that exists between them and the government, are significant factors explaining variability in student performance (Alvarez *et al.*, 2007; Murillo *et al.*, 2002). Beyond the direct consequences of teachers' industrial action in South African schools on learning outcomes, which research by Wills (2014) highlights as considerable, it is extremely challenging to quantify total union effects on the system. However, on the basis of historical events, media reports, research documents and informal conversations with education officials, we highlight how diminished autonomy for decision-making and independence in appointments manifests in reduced accountability and capacity in

13 Provincial union membership has implications for union representation on provincial chambers of the Education Labour Relations Council.

the system, and diminished levels of citizen trust in the public education sector. The various impacts are discussed in further detail below.

Figure 9: *Union membership in the South African education sector, 2012*



Source: Wills (2016a) Union membership figures are compiled from figures of the Public Service Co-ordinating Bargaining Council and the Education Labour Relations Council.

Notes: The teacher union membership figures presented apparently include both teachers ***and*** a small number of support staff. Union membership is then expressed as a percentage ***all*** education personnel in 2012 that are remunerated by the state and privately. The total column of numbers is not shown graphically as this distorts the scale of the provincial figures. NAPTOSA = "National Professional Teachers Organisation of South Africa"; SADTU = "South African Democratic Teachers Union"; SAOU = "Suid-Afrikaanse Onderwysersunie"; PEU = "Professional Educator's Union" and NATU = "National Teachers' Union"

a) Compromised post-provisioning processes and consequent overspending on teacher salaries

Perhaps the most important impact of undue union influence is the distortion of the post-provisioning process as well as the allocation and re-allocation of teachers. New research by Gustafsson (2016) for this project showed that if one simulates how the 'post-provisioning norms' (or the policy determining how many educators each school should have) are implemented, one province far exceeds the others in its ability to implement the norms. This province is the Western Cape. Second in line is Gauteng, whilst three further provinces do a relatively good job (Northern Cape, Mpumalanga and Free State). One province, the Eastern Cape, stands out as particularly problematic. He finds that the percentage of 'misplaced' educators in the Eastern Cape (6.3%) is three times as large as in Western Cape (2.3%) (misplaced in the sense that they are not where they should be in accordance with the post-provisioning norms).

Getting teachers to 'follow' learners is a far greater challenge at the secondary than the primary level. What is particularly striking is the number of districts in the Eastern Cape with a high proportion of secondary schools with more teachers than they should have. In fact, analysis of the distribution of students and teachers shows a four-year lag in the Eastern Cape between student movements and corresponding teacher redeployment. In the Western Cape, Gauteng and the Northern Cape this figure is 1 year (i.e. the best possible situation). So for instance the 2013 spread of teachers in the Eastern Cape is best explained by 2009 enrolment data (a 4 year lag). Unfortunately in the Eastern Cape, Northern Cape and the North West there is evidence of deteriorating compliance with the post-provisioning norms, which dictate how many teachers should be employed and where they should be situated.

The link between under-staffing and learner under-performance is more visible at the primary than the secondary level (Gustafsson, 2016), which is possibly a reflection of the fact that younger learners are more dependent on face-to-face teaching, and thus more sensitive to having fewer teachers. Interestingly, the relationship between under-staffing and under-performance only comes through clearly in provinces which are relatively good at implementing the norms. This is possibly because provinces which are good at implementing the norms are probably also good at implementing other policies affecting schools, so the absence of teachers is felt more strongly.

Contrary to what is often believed, the relationship between under-staffing and the remoteness of schools is rather weak. This is particularly true at the primary level.

Eastern Cape's difficulty in implementing the post-provisioning norms is partly related to the fact that the distribution of learners across schools is remarkably volatile in this province. This is surprising, as it is often assumed that more urban areas, where the close proximity of schools should make it easier for parents to switch schools, display the highest degree of enrolment instability.

The rather effective implementation of post-provisioning processes in a few provinces suggests that in other provinces the key solutions would have to be, firstly, better technical capacity to implement the norms and, secondly, better ability to deal with the politics of teachers not wishing to move from schools with shrinking enrolments. The problem is not mainly one of policy design, though there are some aspects of the norms which require revisiting. Eastern Cape stands out as having particularly large capacity problems, which appear to have become worse over the 2008 to 2013 period.

In some ways, a first priority should be to ensure that all primary schools are adequately staffed, given that the link between under-staffing and learner under-performance is stronger at the primary level, and given that primary-level teachers seem to be easier to move around, so that they 'follow' learners. An analysis of the Annual Survey of Schools of 2013 suggests that this was the approach taken by the Western Cape. Only 3% of Foundation Phase learners were in classes of 46 learners or more, compared to 41% in Limpopo, 36% in the Eastern Cape and 33% in Gauteng (Spaull, 2016b). The secondary-level L/E ratio inequality problem appears more complex and more extensive. Here more complex responses, including better use of remoteness incentives, appear to be necessary.

The NEEDU report of 2013 provides substantive input on some of the post-provisioning challenges faced by certain provinces, and especially how these affect the personnel to non-personnel budgets available to the provinces. It has three recommendations: (1) the need for post-provisioning norms and standards, (2) the development of EMIS capacity in the provinces, and (3) the application of the post-provisioning norms and standards and especially for district managers, circuit managers and principals to be trained in the application of Collective Agreement No.2 of 2003. That Agreement provides the procedures for moving teachers from schools that are losing learners to those in which there is a net gain or, if teachers are unable or unwilling to move, to retrench those in the former areas and hire new teachers in the latter ones.

Limpopo

41%

Eastern Cape

36%

Gauteng

33%

Foundation Phase learners were in classes of 46 learners or more

b) Compromised design and implementation of accountability systems within the education system

Blocking national-level policies enforcing professional accountability

At the national level, SADTU is a critical player determining which policies affecting teachers are accepted or rejected. A concern is the expansion of their scope of influence at the Education Labour Relations Council (ELRC) beyond issues related to pay or worker benefits to include agreements on *all* issues pertaining to teachers' work (De Clercq, 2013).

Beyond advocating for improved pay, benefits and conditions of work, SADTU remains strongly opposed to national policies implying forms of monitoring or control of teachers' work, even where accountability systems are disconnected from punitive measures

(De Clercq, 2013)[14].

14 De Clercq (2013) provides an account of how SADTU has even opposed low stakes accountability efforts, such as the introduction of the Whole school Evaluation of 2001.

These objections to accountability must be considered within a historical context where control over black teachers during apartheid was intentionally bureaucratic and authoritarian to achieve social control. Black teachers were closely monitored by inspectors, subject advisors and other representations of white subjugation (Chisholm, 1999). It is worth noting that in well-functioning schooling systems there is often close collaboration between the employer and unions in areas such as curriculum and teacher training. Such unions resemble professional associations or unions more than they resemble industrial unions.

Amongst other things, teacher unions in South Africa have blocked the following accountability reforms in recent years:

- Standardised student testing, particularly the Annual National Assessments, which is highly necessary to track the performance of the system and inform parents of their children's learning progress;
- Teacher testing (even for matric markers) to identify teacher capability constraints and inform pre-service and in-service training;
- "Weak" pay-for-performance schemes such as the original Occupation Specific Dispensation (Collective Agreement No. 1) proposal necessary to reward effort and attract a stronger pool of teacher candidates into the system[15];
- Performance contracts for school principals to establish clear requirements against which their performance can be assessed and underperformance effectively dealt with.

c) Compromised independence and accountability function of the South African Council of Educators

The South African Council of Educators was established as an independent accountability structure to oversee the teaching profession. As noted by Van Onselen (2012), a majority of the SACE board members are concurrently SADTU members, holding key positions across both the union and the board of this 'accountability' structure. SADTU's position on this body introduces various conflicts of interests in the organisation, and has considerably compromised its independence and functionality (Van Onselen, 2012; De Clercq, 2013). A concern has been expressed that the number of educators that are struck off the SACE base is far too low to be consistent with realistic levels of dismissals, raising concerns about the ability of this organisation to execute its mandate.

d) Compromised bureaucratic accountability

Spaull (2015) notes that different forms of accountability operate alongside one another within an education system. He distinguishes specifically between bureaucratic accountability, which involves the promulgation of laws and regulations that specify norms and standards, and professional accountability. Bureaucratic accountability is weakened where *everyone* in the education sector (including all officials) is allowed to join a teachers' union. Where union membership is pervasive, those responsible for monitoring and evaluating teachers are jointly members of the same union, facing the same incentives

15 After strike activity, there was another agreement in 2009 that terminated proposals that would have provided the intended opportunity for teachers to rise through the salary scale with reasonable speed. Some of the notch progression was exchanged for large once-off increases in the pay of all educators, eliminating the strong career pathing model it provided.

as those they are accountable for managing. This dampens the ability of districts and provinces to impartially apply laws and regulations in dealing with problems of teacher misconduct, absconding from the job, underperformance or decisions involving the allocation of resources to schools[16].

Capacity (and excellence) compromised through union patronage

Where unions are unduly influential in provinces and districts, this undermines the influence of education officials who have prioritised their role as civil servants over political affiliations. These officials face disincentives to remain within the system, as their competence and effort are overlooked where promotion and rewards are aligned primarily to union affiliation or other political interests. Cronyism results and capacity constraints develop within the system, indirectly affecting competent officials who do not receive adequate support and must assist in closing the competence gaps created by political appointments. Even worse, lack of union affiliation can result in bullying or dismissal without just cause. Interviews with district officials undertaken for this research project provide evidence of intimidation by SADTU members, similar to findings at school level reported by Heysteck (2015) and Patillo (2012).

Nepotistic appointments linked to union membership appear to be a serious and systemic problem. The interim findings of the Volmink Commission (Maromo, 2015) highlight corruption concerns in the appointment of school principals, going against the law and aspirations of South Africa's democratic constitution[17]. Since strong causal links are identified between the quality of a principal and student learning in international contexts (Branch *et al.*, 2012) it is vital that these leadership positions are not compromised.

The interim findings of the Volmink Commission (Maromo, 2015) highlight corruption concerns in the appointment of school principals, going against the law and aspirations of South Africa's democratic constitution

e) Compromised levels of citizen trust in the public education sector

Communities interacting with schools where corrupt appointments have been made are likely to lose trust in the education system. Further, where the autonomy and independence of the national department is compromised, for example when abrupt policy changes are made on SADTU demand, this cultivates citizen distrust of new policies and their effective implementation. A pertinent example is the late retraction of the ANA testing instruction in 2015 due to SADTU resistance, leaving district officials bewildered and discouraged.

16 This is particularly a concern where unions are non-partisan and career advancement in the union is a pathway to political power. As recommended in the National Development Plan (RSA, 2012, p. 411), "Although public servants work for elected leaders, their role is non-partisan and the potential to forge a collective professional identity as public servants requires that this distinction is kept clear. In South Africa, the current approach to appointments blurs the lines of accountability."

17 S.195, 197 of the Constitution (Act 108 of 1996) provide that civil servant employment and management should be based on "ability, objectivity and fairness" and "No employee of the public service may be favoured or prejudiced only because that person supports a particular political party or cause". S.18 of the Employment of Educators Act identifies that an educator can be charged with misconduct where he or she "misuses his or her position in the Department of Education or a school, further education and training institution or adult learning centre to promote or to prejudice the interests of any person." Furthermore S.33A of the South African Schools Act of 1996 makes strong provisions for protecting schools against political activities.

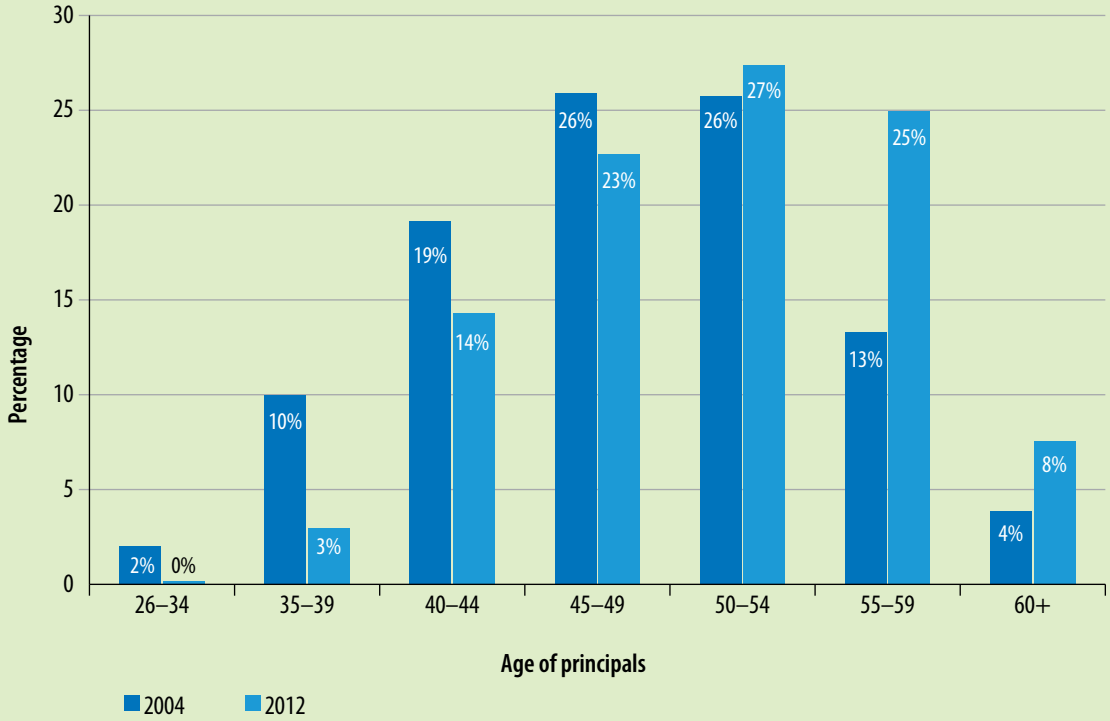
Improving the calibre of school leadership in South Africa

School principals matter for children's learning: both anecdotal and international quantitative evidence support this[18]. But policy makers often do not pay sufficient attention to the way good school leadership can improve the quality of education and the critical accountability role that they play. In research for this project, Wills (2015a, 2015b) provides quantitative evidence on the labour market for school principals in South Africa, highlighting some key features of this market. These include aging and retirement, long tenure, gender inequalities, unequal distribution in terms of qualifications and experience, and unreliable indicators of quality.

Ageing, retirement and tenure

The age profile of principals has been rising. This implies that a large and increasing number of principal replacements are required across schools. In 2004, 17% of South Africa's school principals were aged 55 or older. By 2012 this had risen to 33% (Figure 10). Between 2004 and 2008, about 350 to 500 principals per year retired and were replaced. In the next decade, this figure is expected to grow to at least 1 000 principal retirements per year. This provides a window of opportunity to install good leaders across the school spectrum. Since principals remain in the same job for many years, almost nine to ten years on average, selecting competent principals is very important.

Figure 10: *Age distribution of South African school principals in 2004 and 2012 (calculations from education payroll data – Persal)*



18 See for example Branch *et al.* (2012), Coelli & Green (2012) and Grissom *et al.* (2012).

Gender inequality

There is strong gender disparity in school leadership. While 71% of teachers were women in 2012, only 36% of principal positions were held by women.

Conventional credentials as markers of principal quality

Internationally, qualifications and experience are the main criteria used to recruit principals and determine their pay. However, empirical evidence suggests that these indicators are not the best identifiers of good quality principals. South Africa is no exception in this regard.

Combining education administrative data for the years 2008, 2010 and 2012, Wills (2015a) created a longitudinal dataset of over 4 500 schools, their principals and matriculation results. Using this data, she investigated whether principals' credentials as measured in payroll (REQV and years of service) are useful indicators of quality in South Africa. By comparing the REQV levels and years of service of different principals in the same schools across different years, she was able to assess whether higher principal qualifications lead to improved matric results. She found no positive relationship between REQV levels or years of service and matric results as measured by average mathematics scores and the percentage pass rate in the National Senior Certificate (NSC) examinations in quintile 1 to 3 schools. Principals' years of service are also unrelated to school performance in quintile 4 and 5 schools, but in schools in these quintiles principals' REQV levels show a small positive association with average mathematics scores, though not with schools' pass rate in the NSC.

71%

of school teachers were women, but only

36%

of school principals were women

7 Binding Constraint #3: Weak Teacher Content Knowledge and Pedagogical Skill

32%

of Grade 6 mathematics teachers in South Africa had desirable subject knowledge in mathematics compared with considerably higher proportions in other countries such as

Kenya

90%

Zimbabwe

76%

Teachers cannot effectively teach what they do not know themselves. Until South African teachers are better equipped with content knowledge, learning gains in students through other interventions will be marginal.

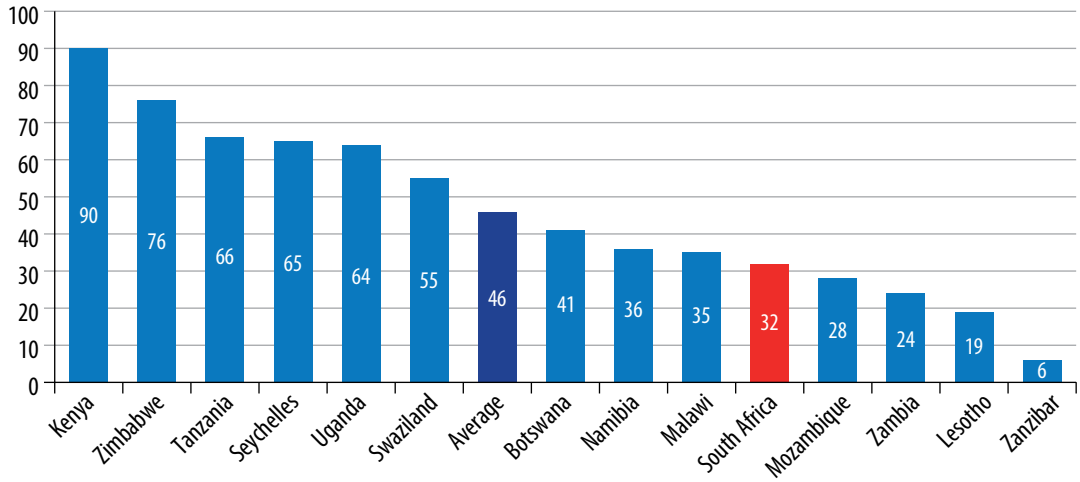
Teacher professional knowledge can be described as comprising three components: (1) disciplinary knowledge, (2) subject knowledge for teaching (also referred to as pedagogical content knowledge) and (3) classroom competence. Disciplinary knowledge refers to content knowledge of the subject which the teacher is appointed to teach. Subject knowledge for teaching encompasses the theory, research base and methods related to the teaching of a particular subject. Classroom competence describes the practical ability to teach in student group context (Taylor & Taylor, 2013). The focus below is disciplinary knowledge.

South Africa's performance in regional context

The SACMEQ study locates South Africa in regional context and is thus a helpful barometer of schooling inputs and performance. While other studies such as TIMSS and PIRLS only assess student knowledge, the SACMEQ study also assesses the content knowledge of students' teachers. The 2007 round of SACMEQ showed that only 32% of Grade 6 mathematics teachers in South Africa had desirable subject knowledge in mathematics (Hungi *et al.*, 2011, p. 52), compared with considerably higher proportions in other countries such as Kenya (90%), Zimbabwe (76%) and Swaziland (55%) (Figure 11).

There were also considerable differences between provinces within South Africa; Mpumalanga, for example, had almost no maths teachers with desirable content knowledge (4%), while in the Western Cape the proportion of teachers that were adequately equipped was considerably higher (64%). A large body of local education research attributes this deficiency to inadequate apartheid-era training and ineffective post-apartheid in-service teacher training. Currently there is no rigorous evaluation of in-service teacher training programmes: a critical gap.

Figure 11: *Percentage of grade 6 students with access to teachers with desirable levels of mathematics subject knowledge (SACMEQ, 2007)*



Source: Own analysis using Hungi *et al.* (2011)

Teacher content knowledge and student socioeconomic status

The research team's recent work on 2007 SACMEQ data, currently the only nationally representative assessment of primary school teacher content knowledge in South Africa, shows that almost four out of five (79%) grade 6 mathematics teachers have a content knowledge level below the Grade 6/7 level, i.e. below the level they are currently teaching. That is to say that they cannot score 60% correct on Grade 6 or 7 level questions (Venkat & Spaull, 2015). These teachers are highly concentrated in the poorest four quintiles of schools, suggesting that inadequate teacher content knowledge in poor schools perpetuates a cycle of poor educational outcomes for students, further entrenching their poverty and weak labour-market status. This finding is borne out by examining South Africa in regional context; it is the only country in the SACMEQ group where the difference in mathematics teacher content knowledge between the poorest and richest school quintiles is statistically significant.

Links between teacher content knowledge and learning outcomes

Existing literature from medium and large scale studies has shown a positive link between teacher content knowledge and student learning. A study by Carnoy and Arends (2012) compared the contributions of classroom and teaching factors to student achievement in maths across the North West Province and Botswana. Teacher knowledge was strongly linked to ratings of teacher quality and opportunity to learn in schools in the North West. Similarly, utilising the NSES panel data, S.Taylor (2014) found student learning improved substantially when teacher knowledge was combined with time on task. A smaller scale study by Reeves (2005) found that the most critical feature of teaching practice related to knowledge and its transmission. The teaching practices with the highest impact involved teachers making explicit the criteria of knowledge evaluation, and engaging students at challenging levels of cognitive demand. It is also worth noting that South African primary school teachers produce worse learner results than teachers with similar levels of subject knowledge in other countries (using SACMEQ data) (DBE, 2013: 24).

Reasons for difficulties in establishing causality

Unfortunately it has been difficult to reliably quantify the effect of teacher content knowledge on learning outcomes, due to high correlations with other input variables. In research for this project, Shepherd (2015) shows that teacher content knowledge is significantly related to learning outcomes, but a causal relationship cannot be established. It is also not clear by how much it matters. As Hoadley (2016) comments, again in research relating to this project, "raising teacher knowledge on its own is unlikely to shift outcomes – teachers need to know how to translate that knowledge for effective learning in the classroom." This implies that content knowledge and pedagogical skill *both* need to be good: moreover, teachers with inadequate education in the discipline in which they teach typically also lack the skills to teach groups of children effectively.

A second explanation is that there may be systemic factors at play, for example the quality of school management. Taylor and Taylor (2013) find that South African students receiving instruction from teachers with weak content knowledge perform disproportionately weakly compared with peers taught by similar teachers in the rest of the SACMEQ group.

Weak teacher knowledge creates a low ceiling which South Africa, as a country, cannot circumvent

Finally, Taylor and Taylor (2013) show that the relationship between teacher content knowledge and student outcomes may best be explained as non-linear. The benefits of strong content knowledge are only significant when a teacher has truly mastered a subject; smaller gains in teacher subject knowledge add little to student learning. It would seem that if a teacher has gaps in content knowledge, the effect on educational outcomes is the same whether the gaps are small or large. This calls into question the usefulness of programmes such as the DBE's "1+4 Teacher Development" where mathematics teachers are trained on Monday on the content that they will teach on Tuesday to Friday. Light-touch interventions such as these are unlikely to improve teacher content knowledge significantly. It is also not clear whether this intervention is being evaluated, thus determining if it did or did not work will be difficult.

Hoadley's (2016) review for this project and the related Zenex research project of the educational literature in combination with various research projects spanning from 1999 to 2015 confirms that weak teacher knowledge creates a low ceiling which South Africa, as a country, cannot circumvent. The McKinsey Report (2007) is correct that the quality of an education system cannot exceed the quality of its teachers.

8 Binding Constraint #4: Wasted Learning Time & Insufficient Opportunity to Learn

In the education research literature there are a number of terms used to describe the amount of time that students are meaningfully occupied in learning activities. These include terms like 'time on task', 'opportunity to learn' and 'engaged time'. Although there is some nuance differentiating these concepts, the overarching principle is the same: it is imperative to measure both the number of topics actually being taught (curriculum coverage), and the amount of time students spend on each topic (curriculum exposure). For the present purposes we will use the term 'opportunity to learn' (OTL).

Poor curriculum coverage and opportunity to learn

A number of South African studies have aimed to measure OTL and have frequently found that less than half of the official curriculum is being covered in the year and fewer than half of the officially scheduled lessons are actually taught. It is useful to provide an overview of the main findings delivered by large-scale studies that have measured OTL:

a) Inadequate teaching time

In a comprehensive year-long comparative study evaluating 58 schools in the North West province and 58 schools across the border in Botswana, researchers found that of the 130 mathematics lessons scheduled for the year, Grade 6 teachers in the North West had only taught 50 lessons by the beginning of November (Carnoy et al, 2012, p. xvi). This amounts to only 40% of scheduled lessons for the year. By contrast, in Botswana Grade 6 teachers had taught 78 lessons by the beginning of November (60% of scheduled lessons). The researchers note that frequently the problem was not teacher absenteeism but rather a lack of teaching activity despite teacher presence. As the authors note "One of [the reasons] brought up by many North West teachers, is the 'lack of confidence' teachers feel in teaching the required elements of the Grade 6 mathematics curriculum. In discussions, teachers attributed this lack of confidence to lacking the knowledge needed to teach the subject" (p. xvi), reflecting the interaction between support and accountability.

b) Teacher absenteeism

A 2010 study by the Human Sciences Research Council found that "a conservative, optimistic leave rate of educators in South Africa is between 10% and 12%" (Reddy *et al.*, 2010, p. 84), which amounts to 20 to 24 days per year for the average teacher. Although these authors do note that this is not exceptional by developing country standards, they also mention that this is likely to be a lower-bound estimate. They furthermore explain that, "Just over three quarters of all leave instances recorded on the Persal[19] system are for one or two days in duration, that is, discretionary leave not requiring a medical certificate. Mondays and Fridays are the most popular discretionary leave days" (Reddy *et al.*,

19 PERSAL is the Personal and Salary System of the Department of Basic Education.

2010, p. x). Spaull (2011), using the SACMEQ[20] 2007 data, finds that the average Grade 6 Mathematics teacher in South Africa reported being absent from school for 19 days. This was much higher in the poorest 20% of South African schools, at 23 days, compared to 11 days in the wealthiest 20% of schools. While it is true that there were severe teacher strikes in 2007, inflating absenteeism figures, these are also self-reported rates of absenteeism and so almost certainly under-reported.

c) Insufficient opportunity to learn

In the early stages of the present project, it became clear that student's exposure to learning opportunities (opportunity to learn, OTL) would be a major focus of the overall findings, given that it features prominently throughout the academic literature and in SA policy documents. It is likely that the low levels of OTL could have their roots in both a lack of capacity (teachers lack the content knowledge and pedagogical skill to teach some content areas) and a lack of accountability (no monitoring by the principal or district officials). It is thus helpful to provide an overview of what we know about OTL from the main South African studies addressing this topic.

- National School Effectiveness Study (NSES): Mathematics. The NSES study of 2007/8/9 is arguably the most comprehensive survey of primary schooling in the post-apartheid period. A multitude of researchers were involved in the project which surveyed and assessed approximately 15 000 students from 268 schools in Grade 3 (2007), Grade 4 (2008) and Grade 5 (2009) from eight of the nine provinces in South Africa (Gauteng was excluded due to other testing). Observing the student's workbooks, the researchers could only find written exercises for 22 of the 89 topics required to be taught in Grade 5. This implies that students covered less than one quarter (24%) of the prescribed mathematics topics for the year. The figures are the same for Grade 4. In fact, only 12% of teachers had covered more than 35 of the 89 topics by the end of the year.

44%

of Grade 4 students had not written any paragraphs during the entire school year

- National School Effectiveness Study (NSES): Language. The NSES data on opportunity to learn language and write text is also deeply concerning. The study showed that most Grade 5 children write in their books only once per week or less. Only 3% of Grade 5 students across South Africa wrote in their books every day. In Grade 4 and Grade 5 exercise books, about half of all exercises in the year were single word exercises. As one of the researchers notes "Of greatest concern is how little extended writing there is in the books…, learners write one paragraph every month and a half of school." (Dechaisemartin, 2013, p.170) It is also significant that the majority of exercises (78%) in the grade 4 books were half a page or less. A shocking 44% of Grade 4 students had not written any paragraphs during the entire school year. The researchers further note: "In the North West and the Northern Cape, close to two thirds of all Grade 4 classrooms in the sample (62% and 63% respectively) had not written any paragraphs throughout the year" (Dechaisemartin, 2013, p. 172).

20 Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ).

- School Monitoring Survey: Use of exercise books. In 2011 the Department of Basic Education surveyed a nationally-representative sample of approximately 2 000 schools from across the country (both primary schools and high schools). This survey included an analysis of exercise books at the Grade 6 and Grade 9 levels. They found that only 53% of students nationally had covered the bare minimum number of exercises required for curriculum coverage[21]. However this figure differs substantially by province. While 85% of students in Gauteng and 76% of Western Cape students had completed this (low) number of exercises per month, only 27% of students in the Eastern Cape and 24% of students in the North West had done so (RSA, 2015, p. 68).
- National Education Evaluation and Development Unit (NEEDU): Writing activities. The 2013 round of the NEEDU evaluation surveyed 218 rural primary schools from across South Africa and conducted an in-depth study in four schools per province (36 schools in total). While not nationally representative, the results of the 36-school analysis confirm other studies of a similar nature. The investigators found that "Not only are the frequency and volume of writing generally far too low, but they are highly variable across the sample. Learners in some schools write, on average, one or two pages a day over the entire year, while the majority write a page twice a week or less frequently. These disparities reflect vastly different opportunities to learn offered to children in more or less effective schools…Only 23.7% of the set of writing activities prescribed by CAPS was completed in a subsample of 36 schools studied in detail. In five schools no extended writing was done at all and in another five schools only one or two pieces of writing were in evidence" (RSA, 2013, p. 43). It is also worth noting that the researchers also looked at the DBE Workbooks and found that in the full sample of 218 schools, more than 80% of children had completed less than one page per day in their mathematics and language workbooks.

In the sample of 218 rural schools, more than

80%

of children had completed less than one page per day in their mathematics and language workbooks

Measuring opportunity to learn

However, irrespective of the cause, it is necessary to first measure OTL to understand how much of the curriculum teachers are covering in different grades in every school across the country. Without this information it is not possible to determine (a) which schools need additional monitoring and support, and (b) if OTL is improving or deteriorating over time in these schools. Although various sample-based surveys have found ways of measuring OTL, there is currently no consensus on how to measure OTL on a system-wide level. While there is considerable information available on educational outcomes from nationally representative surveys over time, there are no on-going nationally-representative surveys of classroom practice which measure how this is, or is not, changing over time. This is a major gap.

21 For instance, the Department used a threshold of seven mathematics exercises a month at the Grade 9 level or six language exercises a month in Grade 6.

Workbooks as a measure of opportunity to learn

In light of the above, a number of local education researchers have for some years now proposed that the DBE Workbooks be used to measure curriculum coverage at a very basic level. The DBE Workbooks that were introduced in 2011 are now available in mathematics and language to all students from Grades 1 to 9. They reach approximately 9 million students and structure the curriculum week-by-week, providing a practice tool for teachers to use.

For present study and the associated Zenex study on the Foundation Phase, two curriculum experts were commissioned to conduct both a comprehensive review of the Grade 3 DBE workbooks for mathematics and language, and an assessment of the purpose to which the workbooks were best suited. The full working paper associated with that review is available online (Hoadley & Galant, 2016). They explored three possibilities for workbook use, namely as a practice tool, an assessment tool, and a monitoring tool. In this respect, they conclude that:

> "The overall high level of curriculum compliance of the workbooks suggests they could be effective as a monitoring tool at a systemic level. It would be possible to gain a crude measure of coverage in key content areas" (Hoadley & Galant, 2016, p. 20).

In their analysis they go further and comment on the potential complementarity of textbooks and workbooks:

> "With the recent proposal to produce a single textbook per subject per grade, this textbook could usefully be aligned with the workbooks. The textbook could then function as a primary transmission text, with clear conceptual signalling as well as relevant tasks, and the workbook could function as a practice tool, either for use in class or as a homework resource (Hoadley & Galant, 2016, p. 21).

Both of the recommendations agree with the conclusions of earlier studies, notably those of Carnoy *et al.* (2012) who concluded that:

> "Findings from our study also suggest that emphasising opportunity to learn through time spent overall on mathematics work, content coverage, spread of topics across each grade year and cognitive and curricular pacing within and across grades, could be an effective strategy to increase learning, especially in poorly performing schools, such as most of those in our sample. To accomplish this, teachers need to acquire more content knowledge and should be held accountable for teaching their classes. *Were such a strategy added to the current effort to provide and use efficiently a well-structured and carefully designed textbook and workbook series, as well as other material, it could greatly improve student learning with almost no increase in per student spending*... This is provided that teachers actually use the books purposefully" (Carnoy *et al.*, 2012, p. xviii emphasis added).

9 Learning from the Past: Understanding Why Previous Reading Initiatives Failed

In this research report we have argued that learning to read for meaning and pleasure in the Foundation Phase is the single most important goal for primary schooling. This goal is pedagogically sound, given that reading is the core academic skill upon which all other skills build, as well as easy to understand and easy to measure. However, it is not new. A number of national and provincial education departments have launched different reading initiatives, strategies, interventions and policy documents in the last decade, all focussing (to various degrees) on reading in the Foundation Phase. Unfortunately there have been almost no success stories, at least in terms of improved reading outcomes verified by a rigorous evaluation.

Many of these policies were seemingly well thought-out, had high-level buy-in and received some level of national prominence. Yet almost all of them have faded away even as their reason for being – the ubiquity of functional illiteracy – still remains as present as ever. Understanding what these initiatives were, what they aimed to achieve, and why they failed (or at the very least failed to sustain themselves), is important if the present policy response is to avoid a similar fate.

We provide a brief overview of the various initiatives, if only to bring them to bear on the current reformulation of those goals and strategies.

In February 2008 the Department of Education published the **National Reading Strategy** (DoE, 2008a) which followed on from the '**National Reading Programme**" launched in May 2006 by Minister of Education Naledi Pandor. While the National Reading Programme was primarily a book programme, the National Reading Strategy was more comprehensive in its approach. The vision of the Strategy was that "*Every South African learner will be a fluent reader who learns to read, and reads for enjoyment and enrichment.*" Also in 2008 the DBE released a 64-page booklet **Teaching Reading in the Early Grades: A Teacher's Handbook** (DoE, 2008b), which covered important topics related to reading and writing, how children learn to read, and what methods teachers can use to teach reading, assess reading and remediate difficulties.

The National Reading Strategy uses similar evidence to what we have presented here and comes to much the same conclusions. Page 11 states that "*The desired outcome of the Strategy is that all learners must be able to read basic texts by the end of Grade 3.*"

Given that it is still appropriate almost one decade later, we repeat the conclusion of the National Reading Strategy in its entirety:

"Reading is, without doubt, the most important linguistic skill that needs to be developed in young children. Reading serves as a building block upon which all other learning takes place…This National Reading Strategy takes as its focus that reading failure begins in early grades, and it is at that level that interventions must be made" (DoE, 2008: 18).

At roughly the same time the Western Cape province launched the **"Numeracy and Literacy Strategy 2006–2016** (WCED, 2006) (sometimes referred to as 'LitNum'). This project was envisaged in much the same way as the National Reading Strategy with the exception that it seemed to have been better sustained[22]. As testament to the high-level similarities between the National Reading Strategy and the WCED's Numeracy and Literacy Strategy, Table 2 below compares the '6 pillars' of the DoE's policy and the '8 domains for intervention' of the WCED's policy.

Table 2: *Comparison of the "6 pillars" of the National Reading Strategy (DoE, 2009) and the 8 "domains for intervention" of the WCED Numeracy and Literacy Strategy (2006)*

National Reading Strategy *(DoE 2009: p13)*	WCED Numeracy and Literacy Strategy 2006–2016 *(WCED, 2006: p3)*
Monitoring learner performance	Monitoring and Support
Teaching practice and methodology	Changes to classroom practice
Teacher training, development and support	Teacher Development
Resources	Learning and teaching support material
Research, partnerships and advocacy	Research
	Co-ordination and sustainability
	Advocacy, Family and Community Literacy
Management of the teaching of reading	–
–	A pre-school programme

From this table it is clear that there is some consensus on the necessary components of an effective literacy strategy. Yet the one has been maintained and the other is no longer in circulation.

In 2008 the Department of Basic Education launched the **Foundations for Learning Campaign**, a four-year campaign to create a national focus to improve reading, writing and numeracy abilities of all South African children. In order to launch the campaign the Department of Education and UNICEF organized a two day conference in Limpopo to 'strengthen and sustain the Foundations for Learning campaign and to showcase best practice in the Foundation Phase, especially in the teaching of reading, writing and calculating.' This was a large endeavour and involved more than 300 delegates including teachers, education specialists, academics from 11 universities, consultants and non-governmental organizations. Both the Minister and the Director-General gave keynote addresses. There is an extensive report covering the conference and all presentations: "**Report on the Foundation Phase Conference**" (DoE & UNICEF, 2008).

22 http://wced.school.za/comms/press/2011/45_12july.html

More recently the **Gauteng Primary Literacy Strategy 2010–2014** (GDE, 2010) was launched with the now familiar, albeit slightly delayed, goal: "*By the end of primary school, all Gauteng learners can read and write fluently for purpose and for enjoyment.*" As part of this initiative, external researchers were asked to review the quantity and quality of existing Foundation Phase literacy materials in the country (SAIDE, 2012). There is now also some documentation in the peer-reviewed literature explaining the implementation of the programme. Unfortunately, due to the absence of an evaluation strategy, this yielded inconclusive findings at the end-line (Flesich & Schoer, 2014). A somewhat better methodology (focussing only on the mathematics results) showed "positive associations" between treatment and outcomes (Fleisch *et al.*, 2016). The method employed here of combining lesson plans, learner resources and coaching is now considered one of a few viable improvement interventions for the primary level. It is also now being implemented in a randomised control trial in the North West, namely the Early Grade Reading Study (Mohohlwane & Taylor, 2015). The study runs from 2015–2016. Yet the GPLMS study was abandoned in Gauteng coinciding with a change of leadership in the provincial education department. While some believe this was integrated into the Gauteng Department of Education, interviews with some of those involved in Gauteng suggest that this is not the case.

As a result of the weak reading outcomes seen in the 2012 round of evaluation of the National Education and Evaluation Development Unit (NEEDU), NEEDU decided to focus on reading in its 2013 study. The outcome was the **NEEDU Reading Study 2013** which reviewed "The State of Reading in Grade 5 in Selected Rural Primary Schools" (NEEDU, 2013). In this report the researchers identified a number of initiatives aimed at improving reading outcomes (many of which are mentioned above). They made special mention of the **Systematic Method for Reading Success (SMRS)** of 2008 (Hollingsworth & Gains, 2009). This was an intervention designed by a consortium of local and international NGOs as an easy-to-use early grade reading programme. As NEEDU (2013: p.28) notes, this programme showed some promise to improve the teaching of reading in the Foundation Phase yet it "disappeared without a trace."

In her education Budget Vote 2015/16 speech[23], the MEC for education in the Western Cape outlined a renewed focus on Grades R-3 over the next 4 years. The project focuses on 100 "**Western Cape Living Lab Schools**" and "...aims to improve language and mathematics teaching and is based on studies from around the world, many of which are informing our new maths strategy. The aim is to ensure that by the time our learners leave Grade 3, they will be able to read, write and calculate at the required levels." The speech goes on to identify the five main findings and recommendations from these studies:

1. "The need for competence testing and careful selection of Foundation Phase Heads of Department.
2. The presence and integrated use of various reading materials and Foundation Phase equipment.
3. The development and use of Norms for reading, writing and mathematics progress in each quarter of Grades R–3.
4. Assessing teachers' capacity to teach English FAL and providing the necessary training for this.
5. Providing qualified and trained maths teachers for dedicated teaching of all Grade 1, 2 and 3 classes."

23 http://wced.pgwc.gov.za/comms/press/2015/21_26mar.html

Given the large number of literacy interventions and reading programmes that have been launched by the national and provincial education departments (only the most notable of which have been mentioned here), the question arises why almost all of these previous initiatives did not stand the test of time. Developing a new national reading strategy should not feel like déjà vu, with a convening of experts, a launching conference, a temporary budget and a brief discussion of how committed government is to solving the reading crisis.

A number of factors may assist to ensure that the same fate does not befall a new national reading strategy. To make a difference, a national reading strategy should meet the following criteria:

1. It must be based on new empirical data that changes our way of seeing the centrality of reading in the academic project.
2. It must show how it is situated relative to earlier policy proposals and interventions.
3. It must have a clear, measurable and shared definition of what constitutes "reading with fluency and comprehension", identifying the language and grade to which the goal refers, as well as clarification on who will do the assessment/evaluation (ideally an independent organisation). Otherwise it would not be possible to realise when the goal has been reached or how much progress has been made.
4. It must have a well thought out and clearly articulated plan for how the strategy can be sustained (particularly financially) beyond a single election or budgetary cycle.
5. Once realistic reading goals have been established, they should form a central component of the performance agreement between the Minister of Basic Education and the Presidency. Monitoring this goal should be housed outside of the Department to ensure independence and credibility in the eyes of the public.

To ensure a new reading strategy lasts it must be based on new empirical data that changes our way of seeing the centrality of reading in the academic project

10 A Roadmap for Reading: A Guide for the Minister of Basic Education

Table 3 below provides an overview of four stages needed for successful implementation of a national reading strategy. They are (1) Prioritisation, (2) Preparation, (3) Implementation, and (4) Sustainability. Across each of these stages there are six core components that hang together and need to be aligned if they are to achieve the desired outcomes. These 6 components are (1) Beginning, (2) Collaboration, (3) Capacity, (4) Accountability, (5) Alignment, and (6) Budget. Each combination is discussed briefly after the table.

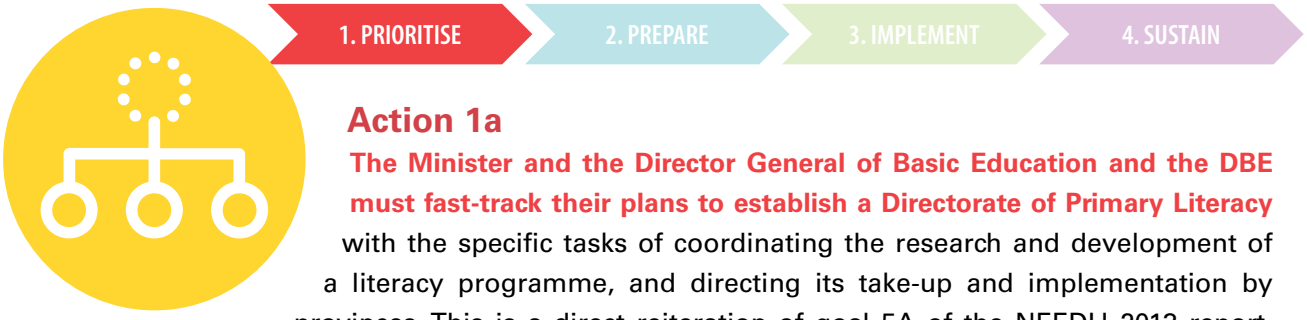
Table 3: *A Roadmap for Action: Four Stages to Getting Reading Right*

Priority Early Grade Reading Goal for the DBE: "All learners read fluently and with comprehension by the end of grade 3."				
	1. PRIORITISE	**2. PREPARE**	**3. IMPLEMENT**	**4. SUSTAIN**
(A) Beginning	Fast-track plans to establish a Directorate of Primary Literacy.	Effectively brand and communicate the national early grade reading strategy and reading goals across all education tiers.	IN-SET on 'how to teach reading' administered across all districts for all foundation phase teachers.	Bi-annual feedback to all education tiers about school and district performance against measurable reading goals.
(B) Collaboration	Request an implementation analysis (IA) of prior early grade reading and literacy strategies.	Engage with DHET and education faculties to address system weaknesses identified in organisational capacity audit.	Developed PRE-SET course on 'how to teach reading' implemented across HEIs offering teacher training courses.	Independent and nationally representative test of Gr. 3 reading proficiency linked to national assessments.
(C) Capacity	Request a capacity audit of the education system to effectively teach reading to learners in early grades. Early literacy research in African languages declared a NRF priority area	Collaborative engagement with the DHET and education experts to develop PRE-SET and IN-SET training courses on 'how to teach reading'.	Foundation phase teachers and HODs track oral reading fluency and DBE workbook coverage of individual learners using SA-SAMs.	A ministerial performance agreement linked to reading goals housed outside the DBE.
(D) Accountability	Establish shared and independently benchmarked standards for reading in both English and mother tongue language.	Develop SA-SAMS module to capture oral reading fluency scores of Gr 1–4 learners and track curriculum as reflected in DBE workbook coverage.	PDEs and national DBE monitor system performance using the SA-SAMs reports on oral fluency and DBE workbook coverage.	Public awards for districts and schools for effective implementation of foundation phase reading strategies.
(E) Alignment	Reformulate a national early grade reading strategy using earlier strategies and findings from the IA.	Education experts to train current and newly appointed foundation phase reading specialists from province and district offices.	Public awareness campaign of early grade reading competencies in all provinces and in all official languages.	All important DBE planning documents to explicitly prioritise the early grade reading competency goal.
(F) Budget	Comprehensive budget analysis of the cost of implementing the national early grade reading strategy.	Specialist Foundation Phase reading experts deployed across districts and Foundation Phase class sizes reviewed	Ensure Foundation Phase classes are not overcrowded and no Foundation Phase class exceeds 45 learners	Create viable career paths for Foundation Phase teachers and specialists

In the past, the Department of Basic Education (DBE) has attempted to address the multiple limitations of a widely dysfunctional system through a comprehensive approach. Areas that are critical to improvement have been given only slightly more attention and resources than those which are marginal by comparison. **There is a need for radical prioritisation of developing the skill of reading in primary school, and particularly the Foundation Phase.** The benefit of having a single unifying goal to focus attention, energy and resources should not be underestimated. Every child should be able to read fluently and with comprehension in their home language by the end of Grade 3 (age 9) as well read First Additional Language texts in English fluently and with comprehension by the end of Grade 3 (age 9).

Priority Education Reading Goal for the DBE: All learners read fluently and with comprehension by the end of grade 3.

Here we provide practical steps to be taken to 1) **prioritise** reading competencies at the foundation phase as a key educational goal and in a national reading strategy, 2) **prepare** the system for implementation of a national reading strategy to achieve this policy priority, 3) **implement** the strategic interventions, and then 4) **sustain** the intervention.



Action 1a

The Minister and the Director General of Basic Education and the DBE must fast-track their plans to establish a Directorate of Primary Literacy with the specific tasks of coordinating the research and development of a literacy programme, and directing its take-up and implementation by provinces. This is a direct reiteration of goal 5A of the NEEDU 2013 report. Many of the actions identified below assume that there is a designated function to take these forward. The Director of this programme should him/herself be an expert in reading and literacy and have extensive networks among South African researchers, non-governmental organisations and funders. All units within the DBE should understand that the "Reading by Grade 3" programme is not simply one *additional* intervention or activity of the Department, but rather *the* unifying goal for the primary school level.

Action 1b

The Minister and the Director General should request an implementation analysis[24] of prior early grade reading and literacy strategies. A number of reading strategies and interventions have been proposed and implemented in the past but have faded out, as mentioned above. Acquire the services of education experts working in partnership with officials in planning and monitoring functions within the DBE and those in the Department of Performance Monitoring and Evaluation (DPME) to revisit all prior documents and policies linked to reading and early grade literacy strategies including NEEDU 2012 and 2013. The aim is to understand the merits of each, where relevant, and critically analyse and investigate the reasons why these strategies did not sustain themselves or achieve their desired outcome. For example through

24 For more details on what an implementation analysis might involve see Weaver (2010) "But Will it Work?: Implementation Analysis to Improve Government Performance". Issues in Governance Studies. No 32, February 2010.

key informant interviews as to the exact reasons that prior national reading strategies faded out. This will form a critical input when reformulating a national reading strategy to avoid historical pitfalls in programme implementation failure. Much of the policy energy that has been expended in the last 10 years has been sporadic and haphazard. Successful programmes are not pursued while new initiatives are funded (but not evaluated) without a clear understanding of how they improve on or learn from previous initiatives. Any new national literacy drive needs to be piloted, independently evaluated and only taken to scale if and when it is proved to be effective. This should be seen as a medium-to-long term goal rather than a short-term goal. The Department should also engage with NaliBali to learn from the successes, failures and applicability of that reading campaign.

Action 1c

The Minister and the Director-General of the DBE should request an audit of the capacity of the education system to effectively teach reading to children in early grades and early literacy research in African languages should be declared an NRF Research Priority area. This will involve an analysis of the demand and supply (availability) of Foundation Phase teachers, subject advisors and curriculum specialists, as well as their competencies to teach reading. A competency audit of all Foundation Phase curriculum advisers will be required. This data-driven analysis should identify the qualifications, institute of study, specialisations and exposure to training on reading of incumbent Foundation Phase educators supplemented with information from the Department of Higher Education and Training (DHET) on teacher graduates. Education specialists should also be approached to provide critical inputs on the quality of current Foundation Phase teaching courses offered by Higher Education Institutions. This will provide important insights into gaps in the system in meeting reading goals and in informing actionable steps to fill critical capacity shortages. The Minister should also lobby for the National Research Foundation (NRF) **to declare that early literacy in African languages become a National Research Foundation (NRF) Research Priority Area**. Given the scale of the reading crisis and the lack of research on African languages at South African universities, the NRF should declare this to be a national priority and dedicate significant resources to it to ensure that more is learnt about how children learn to read in African languages and which interventions are most promising.

Action 1d

Shared and independently benchmarked standards for reading in both English (First Additional Language) and the African languages should be established. This will involve multiple stakeholders and engaging the services of language and linguistics specialists to develop oral reading fluency and (specific) comprehension norms for South Africa's African languages at different grade levels. These will form critical standards against which the reading fluency and comprehension of children can be measured and clear early grade reading goals can be articulated. Although there are already oral reading fluency norms for English home language, there are none for the African languages and only nascent benchmarks for English First Additional Language (some partially developed in this research project – see Draper & Spaull, 2015). It is also not possible to translate English norms into African language norms since the language structure (morphology) is different with English being an analytic language and African languages being agglutinating languages. Without these norms it is not possible to reliably measure and benchmark children's oral reading fluency or comprehension in African languages

Action 1e

A national early grade reading strategy should be reformulated and rebranded. In light of the findings of Action 1b, 1c and 1d, an early grade reading national strategy must be reformulated and re-branded. The strategy must include measurable reading and comprehension outcomes, clear actionable steps for implementation which articulate the required human and financial resources needed to execute the plan, roles and responsibilities of different stakeholders and a system for monitoring and evaluating the implementation of the strategy. Monitoring and evaluation components of the strategy are suggested in actions 2d, 3d, 4a, 4b and 4d.

Action 1f

A comprehensive budget analysis should be undertaken of the cost of implementing the national early grade reading strategy and a realistic implementation plan for the strategy should be developed in view of budget realities. Special emphasis should be placed on providing on-going budget support for this programme until its targets are met.

1. PRIORITISE | 2. PREPARE | 3. IMPLEMENT | 4. SUSTAIN

Amongst other things as determined in the early grade reading strategy plan, preparing to implement the strategy will involve the following actions:

Action 2a

The DBE, with support from externally acquired service provider, should effectively brand and communicate the national early grade reading strategy and priority education reading goal. The single most important goal for the first half of primary school should be the solid acquisition of reading skills such that every child can read fluently and with meaning in their home language by the end of Grade 3 (age 9) and read First Additional Language texts fluently and with meaning in English by the end of Grade 3 (age 9). This goal is easily communicated and understood by parents, teachers and principals and is relatively easy to measure and monitor. The benefit of having a single unifying goal to focus attention, energy and resources should not be underestimated. To this end the Department, together with specialists and Higher Education Institutions, needs to establish a definition of what constitutes "reading for meaning" or "reading with comprehension." This definition should be widely agreed upon, explicit, measurable and easy to understand. The reading strategy must be clearly communicated to all provinces, districts and schools and should clearly spell out each stakeholder's roles and responsibilities. Measurable goals of the strategy must be understood by all and made explicit across district offices and schools. Workshops will be necessary to explain the strategy and specifically re-educate all tiers of the sector, specifically district officials, on why Foundation Phase reading is an educational imperative. The early grade reading goal must be visible, branded effectively and regularly communicated to stakeholders to ensure it is not crowded out by other demands or interventions. The appointment of a professional public relations firm or marketing company on a medium to long term contract is recommended, specifically to manage the national reading strategy.

Action 2b

A collaborative engagement with DHET and education faculties at universities should be commenced to prepare a plan to address system weaknesses as identified in capacity audit of action 1c. Addressing capacity shortages of the system to meet the early grade reading goal will require collaborative action from DHET, education faculties and the DBE. The DBE should also engage with DHET about the new (2015) European Union sponsored 'PrimTED' research programme reviewing the initial preparation of primary school teachers at universities.

Action 2c

Commence a collaborative engagement with DHET and education experts to develop pre-service (PRE-SET) and in-service (IN-SET) training courses to teach Foundation Phase teachers how to teach reading. There is strong consensus that most South African Foundation Phase teachers do not know how children learn to read (in both African languages and English), and even prospective teachers do not spend much time on this at university. Improved courses on how to teach reading must be implemented across all institutions training new Foundation Phase teachers. The courses must be rigorously evaluated before implementation and their content and approach must draw from systematic research of effective courses. The sister-project to this PSPPD research was a report for the Zenex Foundation on "Laying Firm Foundations: Getting Reading Right." As part of that project a group of South African literacy experts was convened to develop a detailed outline of a course to teach Foundation Phase teachers how to teach reading. This detailed outline can be found in the appendix of the Zenex Report "Getting Reading Right" (2016), and the one-page outline is included in this report as Appendix 2. This course should be developed, piloted and evaluated and if it is of sufficient quality should become compulsory for all Foundation Phase teachers in schools where more than 50% of students do not learn to read fluently in the language of learning and teaching (LOLT) by the end of Grade 3.

Action 2d

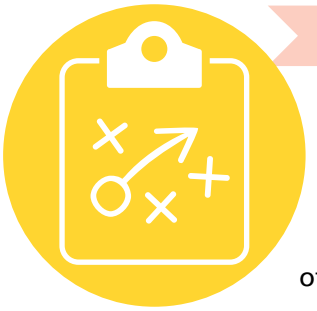
Develop an additional module for SA-SAMS to capture oral reading fluency scores of grade 1–4 children and DBE workbook coverage at bi-annual intervals. Teachers and HODs must test learners at least bi-annually on their comprehension and oral reading fluency levels which is captured in SA-SAMs (SA School Administration and Management System) at the individual learner level. HODs should also capture curriculum coverage of each class using a sample of DBE workbook. This data should then be uploaded to centralised provincial and national data-bases for analysis.

Action 2e

Request the services of education experts to train current and newly appointed Foundation Phase reading specialists at the province and district level on how to teach reading, monitor reading and effectively facilitate a developed INSET reading course.

Action 2f

Specialist Foundation Phase reading experts should be deployed across districts. Although a comprehensive analysis of district capacity levels has not been conducted, there is a general consensus of critical shortages of subject advisors or curriculum specialists. This is likely to be most pronounced at the Foundation Phase level, particularly where subject advisors are not specialists in one area, including reading. In response to the findings of the audit in Action 1c reading specialists will need to be deployed nationally. The appointment of these officials must be on the grounds of expertise and competence only.



Action 3a

Developed IN-SET programmes on 'How to Teach Reading' are administered across all districts for all Foundation Phase teachers using specialist Foundation Phase reading experts as facilitators. Built into this and the other components there should be a monitoring and evaluation role, where programmes and implementation must be developed and implemented as well as periodically reviewed by an independent body.

Action 3b

Developed PRE-SET modules on 'How to Teach Reading' should be incorporated into courses/diplomas/degrees across HEIs offering teacher training courses. The quality of these courses and their facilitation must be regularly monitored with standardized or moderated assessments to ensure cross-institutional quality.

Action 3c

Foundation Phase teachers and HODs should track oral reading fluency, comprehension and DBE workbook coverage of individual learners using SA-SAMs. These results should be used as key performance metrics and in setting new academic goals in school improvement plans and academic progress reports as required in the Education Amendment Act of 2007.

Action 3d

PDEs and national DBE should monitor system performance using the SA-SAMs reports on oral reading fluency, comprehension and DBE workbook coverage. Human resources at provincial and national level must be available to analyse the uploaded performance data from schools. Provincial and district resource allocations should then be targeted at under-performing schools and classrooms. Given that oral reading fluency scores are recorded by teachers themselves (and thus open to considerable gaming if there is an incentive to do so), these should not be used for punitive purposes but rather to identify which schools require the most support.

Action 3e

Public awareness campaign should be implemented on early grade reading competencies in all provinces and in all official languages. The services of a media company should be acquired to develop and implement a national media strategy to raise awareness among parents of the importance of reading for their child's development. For example, inserts could be included in local newspapers with high readerships that provide 1) clear guidelines to parents on what their child should be able to read at a certain age in light of the metrics established in the national reading strategy, and 2) methods to help them support the reading competencies of their child. International donor agencies could be approached to fund such a campaign.

Action 3f

Ensure Foundation Phase classes are not overcrowded and no Foundation Phase class exceeds 45 learners. Using the review of Action 2f, identify problematic districts that have excessive Foundation Phase class sizes and communicate to provincial and district officials that these must be rectified in post-provisioning allocations within a 3 year period (see Spaull, 2016b).

Action 4a

A system for bi-annual feedback to education tiers should be established about their performance against measurable reading goals. National communication channels must regularly provide feedback to provincial, district and school stakeholders on progress achieved in meeting the critical early grade reading goal. This will reinforce the goal and the national reading strategy as a national policy priority and provide useful information to stakeholders on required steps for improvements. Human resources with data analysis expertise will be needed in provinces and at national level to provide effective data on performance to districts and schools.

Action 4b

A nationally representative and independent test of grade 3 reading proficiencies and comprehension should be linked to cycles of national assessment in language and mathematics at the Foundation Phase. This is necessary to track system performance against critical early grade reading goals.

Action 4c

A ministerial performance agreement housed outside the DBE should be linked to reading goals. Once realistic reading goals have been established, they should form the central component of performance agreements between the Minister of Basic Education and the Presidency. The monitoring of this goal should be housed outside of the Department of Basic Education to ensure independence and credibility in the eyes of the public.

Action 4d

Public recognition should be given for districts and schools that effectively implement foundation phase reading strategies and achieve improvements against reading benchmarks. To shift the overt focus away from FET-phase and the prioritisation of matric results to Foundation Phase improvements, equal focus must be given in rewarding success at this phase. A prestigious system of awards for districts and schools should be set up for (i) improvements in learner reading competencies in early grades, (ii) for well-implemented approaches to develop teacher competencies in teaching and monitoring reading, or (iii) innovative approaches to tracking the reading proficiency of Foundation Phase children in schools.

Action 4e

In reviewing (or signing off) all important DBE planning documents, the Minister and Director-General of Basic Education should ensure they give explicit prioritisation to the early grade reading competency goal. All future action plans and planning documents of the DBE should explicitly identify reading competencies as an overarching priority.

Action 4f

Viable career paths should be created for Foundation Phase teachers and specialists. In order to sustain the progress made in the sector it is necessary to retain expertise within the field. Doing so will require that there are viable career trajectories within the Foundation Phase specialisation. This may involve creating prestigious and competency assessed reading coach positions housed in the districts, as well as expert panels and research groupings focussed on reading in each of the African languages.

11 Five Additional Policy Recommendations

1) **Post-Provisioning Norms and Standards:** *Agree on minimum norms and standards for post-provisioning and implementing them within five years.*

As has been articulated in the NEEDU (2013) report, the Minister of Basic Education needs to ensure that the post-provisioning norms are articulated unambiguously in all relevant policy statements. These should stress that the the personnel to non-personnel ratio of 80:20 must be adhered to, that the teacher to support staff ratio of 85:15 must be adhered to. Procedures for constructing an affordable post establishment in each province must begin with the available budget and not with the existing number of teachers employed (Deloitte, UNICED & DBE, 2013). To this end the Department should provide training on roles and responsibilities of education officials that clearly delineate their civil service functions from political functions. Chapter 13 of the NDP on stabilising the administrative-political interface is instructive and requires fuller consideration and application to various layers of the public education sector. Provincial and district officials should also be familiarised with legislation and regulations related to post-provisioning. As reflected in the NDP (RSA, 2012, p. 309), "most of the undue influence of unions is possible because the district officials responsible for recruitment and human resource management have a limited understanding of labour laws."

2) **Improve Monitoring and Assessment:** *Utilise the DBE Workbooks correctly as a basic measure of curriculum coverage and reformulate the Annual National Assessments as a measure of learning outcomes in primary schools.*

The Department must ensure that there are some reliable measures of learning outcomes and opportunity to learn being collected from all schools, especially primary schools. Prior to 2011, the only nationally standardised exams were the matric exams at the school exit. This is too late to identify a systemic need for remedial action within schools where large numbers of students are not learning effectively. Since this research shows that most students are acquiring learning deficits early on (Grades 1–3), accurate indications of learning outcomes at this early stage are required in order to take timeous and directed corrective action. To this end the Department needs to establish processes not only for the collection of this information but for the independent verification of this information (both outcomes and coverage) by independent actors. The suggested frequency of measuring curriculum coverage using the Workbooks is once per term in underperforming schools, with the targeting of monitoring and

support commensurate with the level of underperformance[25]. Schools that have consistently low ANA results should be instructed to use the DBE Workbooks as a primary practice tool in language and mathematics. Given that the majority of Quintile 1–3 schools fall into this category, principals and teachers should be made aware that Departmental officials will be measuring curriculum coverage on a quarterly basis using the Workbooks in these schools. If district officials are aware of how much of the curriculum different schools are covering, they can more effectively target additional monitoring and support.

3) **Increase the Calibre of School Principals:** *Institute independent competency assessments and performance management contracts for principals and promulgate meritocratic processes for appointment and promotion.*

School principal candidates should undergo competency assessment during the appointment process. This may raise the value of candidates' expertise and skills in the selection process, so enabling better decision making than in cases where qualifications and experience are viewed as primary decision factors. Further, when this process is managed by an independent third party, this method of selection could alleviate the problem of politically organised interest groups exerting undue influence in the appointment process. It may also help alleviate the apparent gender discrimination in the principal selection process. Performance management contracts should be introduced for incumbent school principals. Since the principal labour market is characterised by low levels of mobility and high levels of tenure, it is essential 1) that the right principal appointment is made at the outset, 2) that principals are developed over their length of tenure, and 3) that their performance is managed to the benefit of the school. In line with NDP recommendations, performance contracts must be linked to school promotion posts, particularly at the level of the school principal. This will involve resuming discussion on the June 2011 proposed performance contract at the ELRC. Meritocratic appointment processes for appointment and promotion involving independent assessment should be promulgated. Recruitment, especially for education official positions and school promotion posts, should be based on a rigorous meritocratic process that draws on a range of assessment mechanisms. Specifically, recruitment for school promotion posts and all subject/curriculum advisor posts should be outsourced to a third party (independent of vested interests) and involve clearly formulated competency-based assessments. It is important that increased consideration is given to candidates' expertise and skills in the selection process over and above traditional credentials which often have little observable link with performance outcomes. For school promotion posts, equal attention needs to be given to the appointment of primary or intermediate school principals as secondary school principals. Provision should also be made in HR processes, particularly at the district level, to manage school leadership successions.

25 It should be emphasised that crude measures of OTL (such as counting pages with written text on them) are vulnerable to suboptimal strategic behaviour or "gaming." If students are instructed to simply transcribe text from a board into their workbooks, such 'work' would count as OTL, when in fact this has practically no educational value. Thus, before workbooks could be used as a tool to monitor OTL, the Department should create a rubric whereby principals and district officials can assess a sample of student's workbooks and do so in an educationally meaningful way. This may include assessing only a random sample of 10 students per class, only analysing certain pages (unannounced to the teacher), and comparing results across students.

4) **Stabilise Early Childhood Development:** *Increased funding is needed for Early Childhood Development and developing appropriate training programmes for ECD practitioners (both existing and prospective).*

Training needs to prepare ECD practitioners to appropriately and sufficiently stimulate the development of the children in their care. A skilled ECD practitioner is the most vital element to quality early teaching and learning. The practitioner therefore needs to understand the developmental realities of the children in preschool, and especially appreciate that what children learn is as important as how children learn. In line with this adequate ongoing supervisory support and mentoring should be provided. Significant additional funding need to be made available for ECD practitioners. The funding model needs to be thought through carefully, however, in order to prevent the same constrained environment as is currently the situation in the schooling sector. Centers in rural areas, often serving the poorest of children, are frequently severely limited in raising enough funds to obtain full registration, and therefore qualify for a subsidy. A new model to assist centers to obtain full registration is therefore crucial to delivering higher quality services to those most in need.

5) **Utilise Data Better to Eliminate Understaffing in Primary Schools:** *The DBE should better utilise data on where teacher under-resourcing exists and remove interprovincial barriers to teacher movement.*

There is a need for improved and more efficient data and information use, analysis and application to problems and challenges of provision across the system. Better tools, mechanisms, training, and processes for better systemic monitoring and accountability are critical. To identify gaps, analysts should use EMIS data, Persal payroll data and physical infrastructure data in an integrated fashion, since teacher provisioning is integrally related to student movements and classroom availability. Monitoring reports which describe the extent of understaffing should be shared with decision makers, supporting effective vertical communication through the system. To quickly address shortages, geographic barriers such as post advertisement only within provinces should be removed. The initial focus on fixing the post-provisioning problem should be on primary schools, since empirical findings suggest that primary student performance is particularly sensitive to large class sizes. Further, present research shows that a weak Grade 1–3 foundation in reading will undermine all further student attempts to learn.

12 Conclusion

The binding constraints approach adopted in this research project recognises that addressing systemic challenges effectively requires a high degree of prioritisation. It is impossible to simultaneously address all issues. This report together with the research articles, interviews and discussions that underpin it identifies four binding constraints which must all be addressed if there is to be a meaningful improvement in learning outcomes for poorer children. They are:

1. Weak institutional functionality;
2. Undue union influence;
3. Weak teacher content knowledge and pedagogical skill;
4. Wasted learning time.

Since a lack of accountability and a lack of support interact with each other to produce these problems, they must both be addressed to achieve meaningful change and maximise the benefits of intervention.

The consequences of these constraints and their influences on other constraints in the education system are extremely weak educational outcomes. The most alarming of these weak outcomes is the failure of most children to learn to read fluently and with comprehension in the home language in the Foundation Phase. At all other levels and for all subjects, this failure then becomes an additional binding constraint that ruins the life chances of millions of children. For that reason, this report has paid considerable attention to recommendations to remedy this situation in early reading, in addition to alleviating the other binding constraints. If the effect of the four binding constraints can be reduced and progress made towards the goal that all children should read fluently and with comprehension at the end of Grade 3, the education system would be well placed to make rapid progress on a broad front.

The most alarming of these weak outcomes is the failure of most children to learn to read fluently and with comprehension in the home language in the Foundation Phase

13 Research Outputs and Policy Engagement

Throughout the duration of the PSPPD project there was close engagement with policy-makers in the national Department of Basic Education and some individuals in various provincial Departments of Education.

From a publication perspective, a special issue of the South African Journal of Childhood Education (SAJCE) has proved to be an especially good fit for the research and recommendations emerging from this paper, given that the journal is specifically targeted at "policy-makers, researchers, classroom teachers, school managers and teacher educators in childhood education." In order to provide a combination of research expertise and policy experience we asked Dr Nick Taylor (JET) and Dr Thabo Mabogoane (Presidency) to be the guest editors of the special issue, to which they kindly agreed. We believe this special issue (Volume 5, Number 2 of the SAJCE) makes a number of new and important contributions to the South African education research landscape, and again reiterate our warm thanks to Nick and Thabo for their editorial insights and judicious management of the peer-review process. Their full editorial introduction to the special issue is included in an appendix to this report. The full list of articles is included below:

a) Journal articles

Taylor, N & **Mabogoane**, T. (2015) Editorial: Policy research comes of age in South Africa. *South African Journal of Childhood Education*. Vol 5(2) ppi-xvi

Kotzé, J. (2015) Can pre-grade R be the stepping stone to social equality in South Africa? *South African Journal of Childhood Education*. Vol 5(2) pp1–27

Van der Berg, S. (2015) What the annual national assessments can tell us about the learning deficits over the education system and the school career. *South African Journal of Childhood Education*. Vol 5(2) pp28–43

Draper, K & **Spaull**, N. (2015) Examining oral reading fluency among Grade 5 rural English second Language (ESL) learners in South Africa: An Analysis of NEEDU 2013. *South African Journal of Childhood Education*. Vol 5(2) pp44–77

Van der Berg, S & **Shepherd**, D. (2015) Continuous assessment and matriculation examination marks – an empirical examination. *South African Journal of Childhood Education*. Vol 5(2) pp78–94

Wills, G. (2015) Informing principal policy reforms in South Africa through data-based evidence. *South African Journal of Childhood Education*. Vol 5(2) pp95–122

Armstrong, P. (2015) Teacher characteristics and student performance: An analysis using hierarchical linear modeling. *South African Journal of Childhood Education*. Vol 5(2) pp123–145

Van Wyk, C. (2015) An overview of education data in South Africa: An inventory approach. *South African Journal of Childhood Education*. Vol 5(2) pp146–170

b) Policy briefs

Hoadley, U & **Galant**, J. (2016)The DBE's workbooks as a curriculum tool. Research on Socioeconomic Policy (ReSEP) Policy Brief [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Kotzé, J. (2015) Rethinking pre-grade R. Research on Socioeconomic Policy (ReSEP) Policy Brief No. 03/2015. [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Mohohlwane, N. (2016) Adding randomized control trials (RCTs) to the education research toolkit. Research on Socioeconomic Policy (ReSEP) Policy Brief. [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Nuga Deliwe, C. (2016) Building an evidence base for inclusive education in South Africa: Focusing on learners with disabilities. Research on Socioeconomic Policy (ReSEP) Policy Brief [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Shepherd, D. & **Van der Berg**, S. (2015) Is school based assessment in matric achieving its potential? Research on Socioeconomic Policy (ReSEP) Policy Brief No. 02/2015. [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Spaull, N. (2016a) Learning to read and reading to learn. Research on Socioeconomic Policy (ReSEP) Policy Brief. (Online) Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 20 May 2016]

Spaull, N. (2016b) Excessive class sizes in the Foundation Phase. Research on Socioeconomic Policy (ReSEP) Policy Brief. (Online) Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 20 May 2016]

Van Broekhuizen, H. (2015) Increasing the supply of teacher graduates. Research on Socioeconomic Policy (ReSEP) Policy Brief No. 05/2015. [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Van der Berg, S. (2015) What the ANAs tell us about socioeconomic learning gaps in South Africa. Research on Socioeconomic Policy (ReSEP) Policy Brief No. 02/2015. [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Van Wyk, C. (2015) Education datasets in South Africa. Research on Socioeconomic Policy (ReSEP) Policy Brief No. 04/2015. [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Wills, G. (2015) Improving the calibre of school leadership in South Africa. Research on Socioeconomic Policy (ReSEP) Policy Brief No. 01/2015. [Online.] Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 12 April 2016].

Wills, G. (2016b) The misallocation of district resources to the Foundation Phase. Research on Socioeconomic Policy (ReSEP) Policy Brief. (Online) Available: http://resep.sun.ac.za/index.php/research-outputs/policy-briefs/ [Accessed: 20 May 2016]

c) Working Papers

Shepherd, D. (2015). Learn to teach, teach to learn: A within-pupil across-subject approach to estimating the impact of teacher subject knowledge on South African grade 6 performance. Working Paper 01/2015, Department of Economics. Stellenbosch: University of Stellenbosch.

Wills, G. (2015a) A profile of the labour market for school principals in South Africa: Evidence to inform policy. Stellenbosch Working Paper Series No. WP12/2015. Stellenbosch: Department of Economics, Stellenbosch University.

Wills, G. (2015b) Investigating the consequences of principal leadership changes for school performance in South Africa. Stellenbosch: Department of Economics, Stellenbosch University.

Gustafsson, M. (2016) *Teacher supply and the quality of schooling in South Africa: Patterns over space and time.* Stellenbosch Economic Working Papers: WP03/2016 University of Stellenbosch.

Gustafsson, M. & **Taylor**, S. (2016). Treating schools to a new administration: Evidence from South Africa of the possible impact of better practices in the system-level administration of schools. Stellenbosch Economic Working Papers: WP05/2016 University of Stellenbosch.

Hoadley, U. (2016) A Review of the Research Literature on Teaching and Learning in the Foundation Phase in South Africa. Research on Socioeconomic Working Paper (RESEP). Stellenbosch University.

d) Conference

As part of the PSPPD project we hosted a two-day conference titled "Quantitative Applications in Education Research" (17–18 August 2015). The conference had a number of important local and international researchers and policy-makers including the Minister of Basic Education Angie Motshekga, the Superintendent General of the Western Cape Education Department Penny Vinjevold and as well as invited guests Professor Doug Willms and Professor Wilima Wadhwa. In her keynote address the Minister made a point of stressing the importance of quantitative research for education policy-making and thanked the researchers for their on-going support. The full list of presentations are included below:

DAY 1

1. Dr Nicholas Spaull (Stellenbosch University): *Exploring the relationship between oral reading fluency and comprehension among rural English-Second-Language learners in South Africa*
2. Prof Doug Willms (University of New Brunswick, Director of The Learning Bar): *Educational prosperity: A life-course approach to monitoring childhood outcomes*
3. Prof Ursula Hoadley (UCT) & Jaamia Galant (UCT): *Pedagogy and performance: The challenges of measurement*
4. Pheladi Fakude (North West University) / Dr Leketi Makalela (Wits): Barking at text: *A study of Sepedi oral reading fluency: Implications for edumetric interventions in African languages*
5. Ntsizwa Vilakazi (DBE): *Research inside the DBE: Analysing matric results and Annual National Assessments across schools and districts*
6. Dr Stephen Taylor (DBE): *Measuring the impact of educational interventions*
7. Prof Peliwe Lolwana (Wits): *Youth, skills development and employment*

8. Prof Hamsa Venkatakrishnan (Wits): *Assessing early number learning: How useful is the Annual National Assessment in Numeracy?*

9. Prof Servaas van der Berg (Stellenbosch University): *How much learning is taking place in primary grades? What we can infer from ANA*

DAY 2

10. Prof Brahm Fleisch (Wits): *What Works in Classrooms? Building an evidence base using randomised control trials – recent efforts*

11. Prof Wilima Wadhwa (ASER Centre/Univ. of California, Irvine/Indian Statistical Inst. Delhi): *Impact of early childhood education on early grade learning: The role of public vs private ECE participation — Evidence from India*

12. Debra Shepherd (Stellenbosch University): *Balancing act: A semi-parametric method for estimating the local treatment effect of school type*

13. Dr Martin Gustafsson (DBE / Stellenbosch University): *Moving beyond choropleth maps: Using geo-coordinates of schools to answer difficult education policy questions and understand internal migration better*

14. Gabrielle Wills (Stellenbosch University): *A profile of the labour market for school principals in South Africa: Evidence to inform policy*

e) Data sets

The research dealt with a large number of datasets in order to obtain the most complete possible picture of the topic that was possible within constraints of research time. The following were the most important ones:

- SACMEQ (Southern and Eastern African Consortium for Monitoring Educational Quality) survey, 2007
- TIMSS (Trends in International Mathematics and Science Study), [2011]
- PIRLS (Progress in International Reading Literacy Study), [2011]
- ANAs (Annual National Assessments), [2011, 2012, 2013]
- NEEDU (National Education and Evaluation Development Unit) [2013]
- National Senior Certificate examinations microdata [2005–2013]
- Snap Survey data [1999–2013]
- School Monitoring Survey [2011]
- Annual Survey of Schools [2013]
- Persal payroll data [2005, 2010–2012]
- Early Childhood Development (ECD) Audit [2013]

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Appendix 1: Editorial from the Special Issue of the South African Journal of Childhood Education (SAJCE) Volume 5(2)

Editorial: Policy Research Comes of Age in South Africa

Nick Taylor (JET) & Thabo Mabogoane (SA Presidency)

"There are signs that policy-related research in the field of education is coming of age in South Africa. The existence of the present issue of SAJCE is one such sign, and a strong one at that.

At least two factors are implicated in the growth of this kind of research.

First, there is the role of government, particularly through the Department of Planning, Monitoring and Evaluation (DPME) in the Presidency, in commissioning research and making available large data sets. This interest derives from the realisation that the best policy intentions are not easily translated into effective programmes, and that careful research is required to identify problems of programme design and implementation.

Second is the issue of capacity, which is growing steadily, and here an important stimulus has been the establishment of research chairs involving the Department of Science and Technology, the National Research Foundation, and the corporate sector. Though no restrictions were placed on the submission of papers for the current issue of SAJCE, and while all papers were individually submitted and evaluated for publication, the final contributions all have links with ReSEP (Research on SocioEconomic Policy) at the University of Stellenbosch. They grew out of the Binding Constraints in South African Education research project, which is financially supported by the Programme to Support Pro-Poor Policy Development (PSPPD), a partnership programme between the European Union and the South African Presidency. However, this is by no means the only source of policy-related research in the education field, with an increasing appetite for undertaking or supporting work of this kind being exhibited by government, the universities, NGOs and the corporate sector.

This collection of papers spans the spectrum of schooling phases – from pre-primary, through primary and secondary, to the tertiary level – and provides a taste of the myriad dilemmas and decisions facing policy makers and practitioners in shaping and directing the system. The purpose of this editorial is not to systematically summarise the findings of the seven articles featured, but to attempt to distil a set of larger policy implications from the conclusions of the contributors.

While significant progress has been made in the last two decades in addressing the worst aspects of poverty in South Africa, it is clear from the papers in this volume that inequality is the overriding problem in the school system, with 80% of the population very much poorer and endowed with greatly inferior schooling than the privileged one-fifth. All seven contributions are acutely aware of this problem, using it as starting assumption, telos for policy recommendations, or both.

The quality of pre-Grade R provision

What better place to start but at the beginning, with Janeli Kotzé's analysis of the extent to which pre-Grade R is, or is capable of, ameliorating social inequality in South Africa. Her conclusion: not under present circumstances, which are characterised by very rapid quantitative expansion, generally of very poor quality. This brings us face to face with a classic dilemma in making public policy, often posed as a choice between pursuing the goals of equity versus those of efficiency. This is a feature that characterises

all levels and spheres of education in the country. Kotzé motivates for the importance of the pre-school phase, drawing from the research literature, which concurs on the critical importance of nutrition and stimulation during the first 1 000 days for cognitive and non-cognitive development. Assuming this to be true, then there is a serious challenge for policy makers to intervene to ensure that every student receives adequate attention. Kotzé's conclusion is that, currently, increasing provision is being achieved at the expense of quality. Besides the trade-off between quantity and quality, the policy maker is also faced with a challenge of silo planning. A major challenge in offering quality education in the pre-Grade R phase requires that the Departments of Health, Basic Education and Social Development collaborate in order to offer the full suite of interventions needed to have an impact.

A key recommendation of the National Development Plan (NDP) is to expand preschool provision. In order to assess the extent to which this recommendation is being put into effect, the DPME recently commissioned an evaluation of the impact of Grade R attendance on student progress through the Foundation Phase. The study concluded that impact was only discernible for children attending Quintile 5 and, to a lesser extent, Quintile 4 schools (Van der Berg, Girdwood, Shepherd *et al.* 2013). Thus, the rapid roll-out of Grade R provision is, in effect, exacerbating inequity if schools themselves are unable to take advantage of the Grade R intervention. Kotzé's study in the present volume extends these findings to the pre-Grade R phase, providing a great deal of useful detail about the problems of implementation faced at the institutional level.

A second point arising from Kotzé's study that goes beyond the specific context of its phase location is the importance of initial teacher education (ITE) to the quality of provision. This would seem so obvious as to be beyond comment, yet the public debate about schooling seems little concerned with the extent to which ITE adequately equips teachers for effective classroom practice, despite a growing body of evidence to indicate significant shortcomings in this regard.

The growth of educational inequality in the Foundation Phase (FP)

In the second paper showcased here Servaas van der Berg uses data from the Annual National Assessment (ANA) tests to provide more detail to the familiar bimodal distribution of South African test scores. The paper contains much useful policy advice concerning the improvement of this initiative. In particular, by tracing ANA scores across grades by quintile, he shows that the patterns of inequity seen at school exit level have largely been set by Grade 4, graphically emphasising the urgency of the need to change teaching and learning practices in the Foundation Phase (FP) and earlier.

In support of this finding, Beshartie and Tsotsotso (2015), in their meta-analysis of education interventions in South Africa, show that the effect sizes of programmes directed at the FP are significantly higher than those for any other level, indicating the greater impact of interventions in the first three years compared with those in later phases. As Van der Berg points out, had policy makers considered this lesson prior to designing a major intervention for Grade 9 teachers in 2015, costly government interventions might have been better directed towards the early grades than towards exercises such as the '1 + 4' programme currently focused on Grades 8 and 9. The disjunction between research findings and policy decisions signalled by this example raises its head in almost every one of the papers in this issue.

Reading: The 'fulcrum of academics'

While van der Berg employs graphical depictions of the ANA data over time to provide a new perspective on the most fundamental problem in South African society – socio-economic inequity reproduced by schools – in their contribution Kim Draper and Nic Spaull illuminate the mechanism through which this vicious cycle is achieved. The authors use NEEDU data from 4 667 Grade 5 students in 214 rural schools spread across the country. They show that 41% of Grade 5 children are reading at a fluency level below 40 words per minute, the threshold below which they cannot understand what they are reading. Almost all of these non-readers (88%) scored less than 20% on the comprehension test, while only 6% of the sample scored above 60%.

This is an important paper for at least three reasons. First, it draws attention to what must be the most urgent priority, not only in the Foundation Phase, but throughout the system, since

> [r]eading is the fulcrum of academics, the pivotal process that stabilizes and leverages children's opportunities to success and become reflective, independent learners. (Good, Simmons & Smith 1998:45, in Draper & Spaull, 2015)

Second, Draper and Spaull's contribution is an outstanding example of collaboration between the public and private sectors, which in turn may be seen as an indication of the growing maturity of policy-focused research in the country.

Third, the authors conclude with two sets of recommendations that amplify and extend some of the NEEDU conclusions (NEEDU 2014a; 2014b). Calling for a programme to develop appropriate norms for assessing reading fluency, particularly for English Second Language (ESL) students, the authors take further the debate on appropriate reading norms for South African English First Additional Language (EFAL) students, concluding that a benchmark of 90–100 WCPM in English in Grade 5 in South Africa is a good starting point.

A final policy recommendation made by Draper and Spaull concerns reading pedagogy and how it may be improved. Here the authors illustrate just how far we are from developing, let alone implementing, an effective method for teaching reading and writing in the FP, calling for fundamental research into, and an evidence-based approach to, this quest. Inevitably, the logic of their argument goes back to pose fundamental questions to the ITE sector about the extent to which the universities are providing new teacher graduates with the requisite skills in literacy instruction.

Assessment in Grade 12

Moving the focus to high schools, Debra Shepherd and Servaas van der Berg look at the correlations between student scores in the National Senior Certificate (NSC) exams and the continuous assessment (CASS) marks allocated by their teachers. The authors find wide discrepancies between the two scores, with a preponderance towards inflated CASS scores, commonly as high as 20 to 30 percentage points above the NSC marks. While much of this is probably due to teachers inflating CASS scores in the hope of improving the performance of their students, it seems that many teachers simply do not have the requisite grasp of their subjects to pitch their assessment practices to the standards defined by the curriculum. The obvious lessons for policy and practice are that a primary focus in educator professional development should be placed on equipping teachers, school leaders and systems-level officials with the capacity to analyse test scores and utilise the results to improve pedagogy. This is an

important reason for retaining the ANA programme as an aid to communicating curriculum standard to teachers and informing the teaching and learning process.

A second policy lesson for the higher education sector implicit in the contributions of both Shepherd and Van der Berg, and Draper and Spaull highlights the growing importance of the technical aspects of assessment, and the need to provide systematic training to instructional leaders and teachers alike in basic psychometric procedures and how they may be used to inform instruction.

The key role of school principals

There is universal agreement about the importance of leadership to the quality of education provided by a school, whatever the level. This is the issue addressed by Gabi Wills in her examination of the demographic characteristics of the country's principal cohort. She emphasises the importance of making the right choice in selecting a principal: in the context of low levels of principal mobility and high tenure, the leadership trajectory of the average school is established for nearly a decade with each new principal placement. Yet, Wills concedes, research to date has, at best, found a weak relationship between school performance and the quality of school leadership, as measured by means of traditional academic qualifications and years of service of the principal. This finding implies that research indicators and instruments used to assess principal quality do not measure the most important factors contributing to performance. This might be a reason for the inconclusive findings of much of the research literature on school leadership and management. If this is true, then Wills' description of the performance management system for principals as ineffectual is not surprising: if the research literature cannot identify indicators of good practice, then how can we measure performance? The implications of these uncertainties for the research community for school leadership are clear: develop a set of indicators of school leadership and management that guide effective practice.

Given the average age of principals (53 years of age in 2012), Wills predicts that large numbers will need to be replaced in the next five to ten years, further underlining the importance of effective recruitment and promotion procedures in building a cohort of good school leaders. Here too, transfer patterns appear to be skewed towards accentuating inequalities, with more competent leaders finding access into the best performing schools. Current policies are ineffective in ensuring that struggling schools are able to attract and incentivise talented leaders to help turn these schools around. In the interests of increasing the quality of leadership provided to schools, Wills strongly supports the National Development Plan proposals to introduce competency-based assessment in the appointment process, and to implement performance management for incumbent school principals.

There has been movement with respect to the first of these proposals, with the Western Cape applying competence testing in the selection of principals since 2012, and expressing confidence in the positive effects of this practice (NEEDU 2014a). There is some debate on this issue in other provinces and the DBE, while the possibility has been raised of reducing the autonomy of schools, and placing greater authority in the hands of the province, in order to combat nepotistic, corrupt or inefficient school management practices. This debate raises important considerations concerning the balance between maximising the devolution of responsibility to the school level in the interests of democracy, on one hand, and curbing corrupt or self-interested behaviour on the part of local leadership, on the other. Whichever way this debate proceeds in future, quality leadership is key to school improvement, and Wills provides useful suggestions for improving the recruitment and management of principals.

Teacher characteristics

Paula Armstrong quotes Hanushek on one of the few points of agreement among research workers in the complex sector of teachers and teacher education: "[…] the quality of teachers is the key element to improving student performance" (Hanushek 2009:171, quoted in Armstrong in the present volume). Her project is to identify teacher characteristics – in terms of demography, qualifications and teaching experience – that impact on student performance. Working with the SACMEQ data base, it is not surprising that the only factor fitting this description found by Armstrong was teacher age. Survey-type data, on its own, is unlikely to uncover the complexities of school leadership and classroom pedagogy: these are processes that require more nuanced illumination through observational data, in combination with statistical methods. This conclusion raises research questions about how best to measure teacher quality: 'Are we on the right track?' Armstrong asks. Here too, the most likely answer to this question is: apparently not yet. At the same time, Armstrong's conclusions that younger teachers (age group 19 – 29) perform significantly better on the SACMEQ teacher tests than their older peers, and that they are better able to increase the mean performance of students, are very significant. Younger teachers seem better able to elicit better performance from their students, an effect that could be explained in one of two ways. Younger teachers may relate better to their students because they are closer in age to them than their older counterparts. Another possibility is that changes to teacher training may have left teachers trained under the new university-based system better equipped to teach. Armstrong supports the second option, which implies that, since the reorganisation of the initial teacher education terrain in 2003, newly qualified teachers have received an education better suited to teaching than their older peers who were largely educated in the training colleges.

Armstrong's findings are a very welcome piece of good news for a sector which has had much bad press in recent years, starting in 2008 with Crain Soudien, then head of the University of Cape Town Education Faculty and chair of the Higher Education Quality Council (HEQC) review team, drawing attention to the "desperate state" of literacy and numeracy in the country. Yet, continued Soudien,

> [w]e do not […] have a body of empirical work and theoretical engagement that is able to speak to this situation […] after almost 50 years of serious research into teaching and learning, we cannot say, without qualification, what works and what does not.' (Soudien 2008:7)

Shortly after the conference where Soudien made this statement, the HEQC published its wide-ranging – and largely negative – review of programmes in the sector. Of the eighty-one programmes reviewed, only thirty-nine (48%) received full accreditation, with eighteen (22%) either not accredited at all or 'On Notice of Withdrawal', and the remainder being conditionally accredited. More recent research indicates that curricula continue to miss some of the most important skills teachers need in primary school classrooms, such as the ability to teach reading, writing and basic mathematics to their students (Taylor 2014). Government is attempting to redress these weaknesses through the promulgation of policy (RSA DHET 2015), but it is doubtful whether policy and regulation, on its own, is an adequate vehicle for raising quality.

Regarding continuous professional teacher development, Armstrong quotes Raudenbush (Raudenbush, Eamsukkawat, Di-Ibor *et al.* 1993) on his finding that in-service training does not appear to have any significant effect on student performance, whereas internal supervision (by the school principal or

another teacher at the school)[26] has a large and significant effect. These and similar findings pose questions for current initiatives in South Africa, such as those launched by the National Education Collaboration Trust, and the DBE in the form of its 1+4 Programme. Are we learning from our past mistakes and successes? Are we building a knowledge base to guide better development? Are we designing programmes that draw on past experience and scientific evidence? Or are we merely recycling ideas that have largely not worked in the past?

The availability and quality of data

In his contribution Chris van Wyk notes that in recent years there has been a considerable expansion in the availability, and in some cases also in the quality, of data available for policy formulation, management decision making and research. It must be said that this development has been an important contributor to the recent upsurge in policy-related research in the school sector. Not only is government commissioning more research, but it is making available data, both to its commissioned service providers and the research community in general. And this is occurring across government departments, making possible the linking of data on a variety of socioeconomic and other indicators.

Van Wyk produces an inventory of data sets available in the terrain of education, details their features, and indicates where they can be found. This is very helpful information for research workers. He goes on to make recommendations for improvements to the accessibility and utility of existing data sets. In particular, Van Wyk recommends that data sets be linked through the standardization of unique institution and individual identifiers.

Conclusion

The most significant development in South African education since the establishment of the first democratic government in 1994 has been the growth in numbers enrolled at all levels of the system: Grade R, primary and secondary schools, Further Education and Training (FET) colleges and universities (Table 4).

Table 4: *Growth in enrolments in education by level*

	Grade R	Secondary schools	Colleges and AET	University	Teachers
Growth no	552 739		312 062	428 373	5050
Growth %	244%	300%	87%	82%	48%
Period	2000–13	1970–1995	2010–13	1994–2012	2004–2013
Source	RSA DBE 2011a; 2013	Crouch & Vinjevold 2006	RSA DHET 2104	Taylor, Fleisch & Shindler 2008; CHE 2014	CDE 2015

26 This is in contrast to external supervision by a district official, which shows no significant impact on student performance.

Some of the phenomenal growth in enrolment began under apartheid, particularly with respect to secondary schooling following the Soweto uprising of 1976, and higher education, where an expansion of 73% was recorded during the seven years leading up to 1994. But growth in Grade R, colleges and universities has exploded since 1994. Such rapid expansion must strain resources, and in particular, the skilled human resources required to deliver quality education. Under the circumstances, a policy question that begs asking is: would it not be wise to place a moratorium on further expansion and focus on quality? For example, in pursuing technical and vocational training, why not build centres of true excellence – say, an outstanding FET college in each province – staffed by the best teachers, with excellent facilities, and a student body selected from among poor children exhibiting the highest potential? This would both boost the skilled human resources the country so badly needs, and create role models of children rising out of poverty through the development and exercise of their talent.

Line function ministries tend to avoid such choices, for two main reasons. First, political time horizons are shorter than the time it takes to build successful institutions, and in the meantime budding centres of excellence look like bastions of privilege. Second, the symbolic benefits of providing easily visible resources such as learning places for children, new buildings or computer hardware, tend to obscure, in the short term, the poor quality attendant on such expenditure.[27] In addition, should it become apparent that the benefits offered by such education are not fulfilled in the market, the public will lose faith in the promise of education to fulfil their aspirations, and that is a frightening prospect. A key element in developing the education system is the importance of having a long-term plan, such as the National Development Plan, to guide government in developing long-term quality goals. And here the work of the Department of Planning, Monitoring and Evaluation is important – in commissioning independent research into key problems of delivery.

These considerations point to a long-standing debate in the field of public policy analysis concerning the relationship between goals that seek to promote equity through spreading resources more equitably across the population, and those that prioritise efficiency (or development), which, classically, were thought to require the concentration of resources. Thus, for makers of public policy, choices were often seen to involve difficult trade-offs between competing policy options serving, respectively, the goals either of equity or efficiency (NEPI 1993). A break with this dichotomy was attempted by the World Bank in 2006, when it declared that:

> For many, if not most, people, equity is intrinsically important as a development goal in its own right. But this Report goes further, by presenting evidence that a broad sharing of economic and political opportunities is also instrumental for economic growth and development. (World Bank 2005: 9)

Equity and development; we can have both, the Bank confidently asserted, and the achievement of this state would depend on two principles: equality of opportunity, irrespective of the conditions of one's birth; and the avoidance of deprivation in outcomes, particularly in health, education and consumption levels.

Yes, but that is precisely the problem: it is one thing to spread resources relatively equitably across the population; indeed public resources in South Africa have a pro-poor bias. But it is quite another

27 To its credit, the Department of Basic Education has published a plan for schooling directed towards twenty-seven goals; nine of the thirteen output goals are unequivocally about improving the quality of provision (RSA DBE 2011b). However, problems with the system designed to measure quality is bedevilled with problems of design and perceptions that government is spinning the results, although it is not clear whether this is through ignorance or design.

matter to achieve the second principle on which equity depends: equality of outcomes. The papers in this volume indicate how far the education system is from giving effect to the principle of equality of learning outcomes. Debates about alternative routes to equity are vast and cannot be entered into systematically here, except to make the point that we live in a time of uncertainty regarding many policy issues, most obviously in the field of national and cross-national financial regulation, and environmental control.

Nowhere is this uncertainty better illustrated than in the 2015 World Development Report (World Bank 2015). The title of this Report – 'Mind, Society, and Behavior' – captures the idea that paying attention to how humans think and how history and context shape thinking can improve the design and implementation of development policies and interventions that target human choice and action. "To put it differently," the Bank declares, "[…] development policy is due for its own redesign based on careful consideration of human factors" (ibid:2). The details of this new approach sound intellectually exciting, politically inclusive, and crammed with common sense. It also sounds as if the Bank is going back to the drawing board. This is not to hold a candle for the particular approaches, past and present, adopted by the Bank, but to illustrate how uncertain this major player has become about the effects of its own policy advice and funding choices. The 2015 World Development Report concedes that experts, policy makers and development professionals, like everyone else, are subject to the biases and mistakes that can arise from thinking automatically, thinking socially, and using faulty mental models. It recommends that development professionals need to be more aware of these biases, and that organizations should implement plans to ameliorate them.

In this climate, the final advice offered by the 2015 Report (World Bank 2015) is that development practice requires an iterative process of discovery and learning. Careful research, replicated under different conditions, viewed from different angles, is what builds a knowledge base to guide policy. These proposals seem eminently sensible. In the past they have been little practiced in South Africa in the domain of education, but the papers in the present volume indicate that the capacity to undertake policy-related research is expanding. At the same time, a major factor in stimulating policy research in education is the willingness on the part of providers – principally government – to commission such work to private sector and civil society agents and to make information available for secondary analysis.

In conclusion we offer four priorities for policy research in South Africa. First, if primary school teachers are unable to teach literacy and basic numeracy to their students, there seems little point in attempting any of the other subjects. Yet, it has become as clear as day that the majority of South African teachers are unable to wield either of these skills effectively in their classrooms. It also seems obvious that they should learn these disciplines during their initial teacher education, pointing to a primary quality blockage in the cycle of schooling. Developing effective literacy and numeracy programmes that equip new teachers for successful instruction are research and development tasks that only partially intersect with policy research. They will require work on the part of experts in curriculum, pedagogy and assessment, and their achievement will immeasurably enhance the professional status of teaching.

A second priority must be to establish the characteristics of effective school leadership and management, and of successful teaching. There has been much criticism of the Integrated Quality Management Strategy, in the sense that many of the indicators bear no necessary relationship to effective pedagogy or school leadership (RSA DoE 2009). Yet, to date research results in this area have been disappointing. These are also tasks that require the participation of educational experts, in addition to statistical modellers. Effective pedagogy will be determined by the extent to which it achieves success in getting students to master the curriculum, which links this second priority closely to the first.

A third priority concerns in-service training. Government budgeted R1.1 billion to training in 2014 (RSA DBE 2015). Although only R4.2 million was spent, this is a significant sum. The private sector contributed at least an equivalent amount (Trialogue 2015). But what have we learnt from all this activity, which has been operating at this kind of scale for decades? Not much, is the honest answer. The priority here is not only to evaluate individual programmes, but to systematically build a knowledge base that guides effective policy, programme design and roll-out. Two of the research programmes in this area (Fleisch, Taylor, Schöer & Mabogoane 2015; Schollar 2015) have both adopted or are adopting a research and development approach. A third example in this important field is the meta-analysis conducted by Besharati and Tsotsotso (2015).

The fourth priority for research into educational policy and practice lies in the field of technology, a key topic not touched on by the contributors to this volume. Technology, in a wide variety of forms, and serving a multitude of uses, is flooding into our schools and classrooms. The inflated expectations attendant upon – and inadequate preparation for – many large initiatives often do not seem to heed the advice of the Organisation for Economic Co-operation and Development (OECD) on the potential of technology to enhance the quality of schooling: "Technology can amplify great teaching, but great technology cannot replace poor teaching" (OECD 2015:190). Technology roll-out comes with many problems that, if not addressed, "may do more harm than good to the teacher-student interactions that underpin deep conceptual understanding and higher order thinking" (ibid). Gauteng is currently in the middle of a second round of technology roll-out, following the failed Gauteng Online programme of a decade ago. Have we learnt any lessons from these efforts? Are we learning from the rapid roll-out of phase two? It seems that the deployment of technology in schools, an inevitable development, would happen most efficiently if accompanied by research of various kinds: design, implementation, process and impact."

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Appendix 2: Abstract for "*Teaching Reading (& Writing) in the Foundation Phase*" by Elizabeth Pretorius *et al.* (2016)

This concept note was developed by five South African academics under the leadership of Professor Elizabeth Pretorius (UNISA). The other four authors are Prof Veronica McKay (UNISA), Sarah Murray (Rhodes University), Mary-Jane Jackson (University Fort Hare), and Dr Nicholas Spaull (Stellenbosch University). The concept note starts with the premise that too many South African Foundation Phase (Grades 1–3) teachers do not know how to teach reading and are currently teaching reading in an ad-hoc, unsystematic way. Consequently the Note aims to provide a detailed outline of a potential online teacher training course which could be used to teach Foundation Phase teachers (and subject advisers) how to teach reading in the Foundation Phase in South Africa. After providing some information on the state of reading in South Africa and the need for the proposed course, the Concept Note outlines (1) what such a course should entail as far as content is concerned, (2) how the course should be structured, delivered (modality) and assessed, (3) how it could be accredited, and (4) how it should be evaluated. While we have tried to provide sufficient detail on the proposed course, the aim was not to provide an exhaustive or comprehensive document of such a course, but rather a solid outline of an 'ideal' course; in essence a detailed concept note. Towards the end of the concept note we provide provisional estimates of the costs associated with developing, evaluating and implementing the course. The detailed outline is 26 pages long and available from the Zenex Foundation.

Table 5: *Overview of "Teaching Reading (& Writing) in the Foundation Phase" course*

	Module	Description	Cross-cutting themes			
1	How children learn to read	Introduction to course; processes of learning to read, emergent literacy; formal reading instruction; enabling conditions; the role of exposure; poverty and reading	Big Picture: How does this fit into the overall course structure?	Where is this in CAPS?	How and when do I teach this in Home Language and in English First Additional Language?	How does this progress across Grades R-4? (developmental trajectories)
2	Decoding in reading (and writing)	Phonological awareness; letter-sound relationships; phonics (&using workbooks); word recognition; fluency; developmental trajectories				
3	Comprehension in reading	Types of comprehension (literal, inferential, etc); text types; comprehension strategies; developmental trajectory				
4	Vocabulary in reading	Levels of vocabulary; strategies for developing vocabulary; vocabulary and fluency; developmental trajectories				
5	Children's literature and the role of response in reading	Children's books; affect, engagement & motivation; Read Alouds; reading corners, print-rich classrooms				
6	CAPS reading activities	Group-guided, paired, shared, independent reading; ability groups; selecting graded readers for groups; designing activities and managing the groups; how to use DBE workbooks effectively				
7	Reading assessment and remediation	Formative & summative reading assessment; identifying reading difficulties; developing remedial strategies; special education				
8	Planning and consolidation	How everything fits together; macro and micro planning (year, term, 2-week cycle; lesson); managing learning				

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