

Curriculum News

Improving the quality of learning and teaching
Strengthening Curriculum implementation from 2010 and beyond

2013

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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



FOREWORD

BY THE MINISTER



Mrs Angie Motshekga, MP
Minister of Basic Education

Curriculum News has proven to be a popular vehicle for communicating our curriculum initiatives and I am very pleased about this. As we come to the close of our term, our *Curriculum News* reflects on many of our recent initiatives. We monitor as we implement. Key leaders in implementation of our strategies have written the articles for us, a new approach in *Curriculum News* to include the voices of implementors at both national and provincial level.

Our greatest challenge in this administration has been to tackle the literacy and numeracy outcomes highlighted in all international, regional and national assessments. We ourselves undertook the Annual National Assessments as a diagnostic tool to assist in developing formative initiatives at provincial, district and school level. The NEEDU Report has also provided further valuable information on reading practice in the Foundation Phase.

We investigated the implementation of our two main strategies, the Reading Strategy and Maths, Science and Technology Strategy. Both made recommendations to assist us in strengthening implementation at provincial level. This *Curriculum News* reports on the investigations, as well as the literacy and numeracy strategies undertaken in Western Cape and Gauteng. Both Gauteng and Western Cape have pioneered new approaches and interventions that we have no doubt have sown the seeds of educational improvement for the future. We highlight progress in Dinaledi schools. A Ministerial Committee in the curriculum in technical high schools has also made recommendations to introduce specialisation and technical maths at technical high schools. All these reports inform our planning ahead.

One of our most critical national interventions has been the development and distribution of workbooks up to grade 9 in literacy, numeracy, life skills and natural sciences. Veronica McKay from UNISA, who has led this remarkable intervention, has written an article for us on how to use the workbooks.

We are in the final cycle of the CAPS implementation, and the last set of new textbooks corresponding to the new curriculum has now also been delivered. As this delivery cycle is completed, the priority for schools becomes not only using them productively and regularly, but also caring for them and using them in a way that ensures future use by future generations of scholars. Retention and retrieval of textbooks is a practice that has fallen out of use in many schools and has not been in practice in many others. We are now aiming to ensure that this becomes standard practice in our schools. We therefore also carry an article on this in the current *Curriculum News*.

THE WORK OF THE NATIONAL EDUCATION EVALUATION AND DEVELOPMENT UNIT

Nick Taylor, CEO

The National Education Evaluation and Development Unit (NEEDU), is designed as an evaluation and development institution which is independent of that part of the civil service responsible for the administration of schools. Following the recommendations of a Ministerial Committee set up by Minister Pandor in 2008, NEEDU was established shortly after Minister Motshekga was appointed in 2009.

The purpose of NEEDU is to identify the critical factors that inhibit or advance school improvement, and to recommend appropriate developmental interventions to support schools and teachers. NEEDU approaches this task in a systemic manner, first visiting provincial offices in order to understand how each province directs, monitors and supports the schools it administers, in terms of the policies

and programmes issued by the national Department of Basic Education (DBE). This is followed by a visit to one or two districts within each province, and finally, a random sample of schools in each district are evaluated in terms of curriculum leadership and the processes and outcomes of teaching and learning.

Teaching and learning in the Foundation Phase

In 2012 NEEDU school evaluators visited all 9 provincial offices, 15 district offices and 133 schools, assessing the extent to which national and provincial policies were being implemented across the four levels (national, provincial, district and school) of the system. The districts visited in 2012 are shown in the table below.

PROVINCE	DISTRICT	NUMBER OF SCHOOLS
Free State	Thabo Mafutsanyana	10
Gauteng	Johannesburg Central	8
	Johannesburg West	7
Northern Cape	Frances Baard	18
Western Cape	West Coast	8
	Metro North	8
North West	Bonjala	8
	Tlokwe (Dr Kenneth Kaunda)	8
Mpumalanga	Ehlanzeni	8
	Gert Sibande	8
Limpopo	Vhembe district	8
	Waterberg district	8
KwaZulu-Natal	Ilembe	8
	Umlazi	8
Eastern Cape	Mt Frere	10

In particular, NEEDU examined the quality of monitoring and support provided to schools and teachers, and the quality of teaching and learning taking place in South African classrooms. In 2012 the focus was on the Foundation Phase (FP) in urban primary schools.

On the positive side, in 2012 NEEDU evaluators found that implementation of three important curricular innovations on the part of the DBE were proceeding well. First, the large majority of FP teachers had received training on the

new CAPS curriculum and had the documents in their possession. Second, distribution of the workbooks produced by the DBE for Grades 1-6 in maths and language had reached schools, with very few hiccups. Third, the second administration of the Annual

National Assessment tests in Grade 1-6 and 9 in 2012 had also proceeded largely successfully. These trends are continuing in 2013. It is NEEDU's view that these three programmes have the potential to lift the quality of teaching and learning very significantly. Each of these interventions is a major undertaking and the fact that all three had achieved high levels of delivery in only the second year of implementation is a tribute to the DBE and its provincial counterparts.

The biggest obstacle to the effective use of these programmes in promoting teaching and learning is inadequate capacity on the part of teachers, school leaders and system-level officials. Specifically, the subject knowledge required to interpret the curriculum and translate it into meaningful classroom activities, is at a generally low level throughout the system. Thus, Grade 6 maths teachers struggle to perform simple arithmetic operations, while their language counterparts have trouble answering comprehension questions requiring straightforward inferential reasoning. Since school-level heads of department (HODs) and district-level subject advisors (SAs) are generally not selected on the basis of superior subject knowledge, HODs and SAs are generally unable to provide teachers with the assistance they need. While NEEDU evaluators found outstanding teachers, HODs, principals and district officials across the length and breadth of the country, in general both the subject and pedagogical knowledge of most educators require a great deal of improvement if the school system is to attain the standards set by the curriculum.

It should be emphasized that, although lax practices are present in around 30% of schools, the main factors inhibiting quality schooling is not the fault of teachers, but of their own poor education. Most teachers in South Africa currently active in our schools were trained in the old rural colleges which generally provided education of very poor

quality. The teacher bashing that routinely accompanies discussions on schooling serves to further demoralise an already beleaguered teaching corps. And demotivated teachers find it difficult to raise their efforts.

Language further complicates matters. Four problems are apparent here: the multiplicity of languages in many schools, the fact that the local dialect of any African language is generally significantly different from the standard form used in the curriculum, the mismatch between the mathematical terminology familiar to teachers and children and the official terminology in the African languages, and a lack of proficiency in English on the part of teachers and learners. The example of Primary School X (see Box 1) illustrates the point.

Box 1: Language complexity at Primary School X

This is a multi-grade school with 103 learners situated in a rural village in Mpumalanga. It was established by the Lutheran church in 1898 and the original stone building is now used as a Grade R classroom, while the rest of the school is housed in well maintained brick buildings. The classes are attractively adorned with posters and equipment. The school has an extensive and very productive food garden at the back, and the garden in front won the inter-school gardening competition in 2011.

Learners speak one or more of four languages at home. Sepedi dominates (about 70%), followed by siSwati (20%), isiZulu (5%) and Xitsonga (5%). The LOLT in the FP is Sepedi, but even Sepedi speakers struggle as the language they speak at home differs from the Sepedi used in textbooks, the ANA tests and the DBE workbooks. The principal explains:

In general, the language that is spoken in the community is not the correct language. One cannot say whether it is Isizulu, Siswati, Xitsonga or Sepedi. They mix all of them up and it affects the learners ...

He also attributes poor performance in mathematics at Grade 6 level to learners' inadequate grasp of English, which in turn hampers understanding of what is required by many test items.

EFFECTIVE TEACHER TRAINING

In order to address this situation NEEDU made three kinds of recommendations. First and foremost is the question of educator training and development. In this regard, it is discouraging to note that tens of thousands of teachers, school leaders and officials have received in-service training over the last two decades, with very little apparent effect on the system. While there are examples of excellent training programmes, it is clear that the large majority have been ineffective and that the whole question of capacity development requires a radical rethink on the part of government, the universities and NGOs. NEEDU recommends that the evaluation of training programmes receives urgent attention from the DBE, with a view to identifying interventions which have a positive effect in the classroom.

PROMOTION BASED ON RELEVANT KNOWLEDGE

Second, it seems that, although capacity is generally low, there are many exceptions and the system is not making best use of the capacity that does exist. Thus, promotions to HOD and higher are usually made on the basis of seniority (or, worse, nepotism) rather than expertise. For example, a HOD for the FP who teaches in the Senior Phase and whose subject specialization is EMS, is unlikely to be able to assist FP maths teachers with the intricacies of ratio and proportion. It is strongly recommended that subject knowledge and pedagogical success serve as the only criteria for promotion within the system. This recommendation can be implemented immediately in schools, district offices and higher levels of the system without any changes to the existing regulatory framework. All it requires is the will on the part of institutional governors and managers.

MONITORING AND SUPPORTING READING AND WRITING

Finally, the function of Instructional Leadership (IL), through which monitoring and support services are provided to schools and teachers, is key to effective teaching and learning. Given the low levels of capacity noted above, it is not surprising that IL is not effective in most districts and schools. A number of NEEDU recommendations attempt to address this problem, by providing simple rubrics for district officials and school leaders to use in assessing the quality of learner reading and writing in schools.

IN-SCHOOL PROFESSIONAL DEVELOPMENT

HODs and other SMT members need to understand that the main purpose of monitoring the work of teachers is to identify problem areas so that assistance can be provided. Monitoring is aimed at judging teachers in order to give them a score, but to find ways of helping them to be more effective in the classroom. And here, teachers can do much to help each other in their schools.

One of the things that NEEDU evaluators did in 2012 was to observe two Grade 2 reading classes in each school visited. In almost every case it was found that one teacher showed significantly greater expertise in teaching reading than the other. This is a situation which is tailor-made for in-school professional development (IPD), where teachers observe each other teaching, demonstrate how they teach particular topics, and discuss different approaches to problem areas.

It is the function of members of the school management team, and of HODs in particular, to lead and systematize IPD. What this requires is a movement away from the current practice of teachers working in isolation, towards a situation where educators within each school work as a team, learning from each other in the interests of improving institutional performance. This, in turn, will require cooperation between system-level officials, teacher unions and school leadership.

Teaching and learning in the Intermediate Phase

In 2013 NEEDU is looking at the quality of curriculum delivery in the Intermediate Phase in rural and multigrade classes, and in subsequent years the Senior and FET phases will be investigated. Preliminary data coming from the intermediate phase evaluation suggests that the inability to read for understanding is a key inhibitor to success in learning. A product of NEEDU's 2012 work was to suggest the need for specific norms against which foundation phase learners' oral reading fluency can be measured. This will provide a measure against which teachers and school leaders can assess their learners' ability to read for learning. The work of developing reading norms for learners has continued into the Intermediate Phase evaluation cycle and we look forward to presenting the results of our 2013 evaluation in the upcoming NEEDU National Report, due early in 2014.

Investigation into Reading Programmes in Provinces

The Department has undertaken a number of initiatives to address reading in schools. In this regard, its Reading Strategy is of critical importance. The Strategy prioritises teacher development, standardization of curriculum implementation within and across provinces, and the provision of quality learning and teacher support materials (LTSM). In 2012, the Minister appointed a task team to understand better how provinces are implementing the strategy and to provide recommendations on how to strengthen implementation.

The Ministerial Reading Programme Audit Team was established on 19 November 2012. The *Terms of Reference (ToR)* tasked members with the collection of information, both qualitative and quantitative, and evidence documents, where available, from a small sample of provincial and district officers, and school-based educators. Using a semi-structured questionnaire, each sub-team was required to interview provincial officials, the relevant district officials, and the Foundation Phase teachers and management in three schools.

The team included Paula Gains, Babsie Matabane, Dinah Molefe, Dudu Shezi, Poppy Thabethe and Margaret Webber. A reference group consisted of Brahm Fleisch of the Gauteng Primary Literacy and Maths Strategy (see article) and Brian Schreuder of the Western Cape Education Department (see article). While the team was tasked to give attention to *Reading Programmes*, it proceeded from the assumption that writing, speaking and listening are all equally important elements of literacy and language teaching and learning.

Strengths and weaknesses were identified in terms of the following salient themes:

- Evidence of provincial strategies
- Responses to Curriculum and Assessment Policy Statements (CAPS)
- Reading resources (including DBE workbooks)
- Access to libraries
- Scripted lesson plans
- Reading Enhancement Activities
- The role of the curriculum advisors
- Teacher Development
- Parental involvement and community advocacy
- Learners with reading barriers
- Information sharing and policy dissemination
- Use of service providers
- Programme evaluation
- Curriculum leadership

Findings

The team found evidence of some good practice in terms of **provincial literacy strategies** and **district and school-based implementation**. Gauteng (GP) and Western Cape (WC) are the provinces where there is most evidence of detailed and large-scale provincial strategies being implemented. Other provinces gave evidence of some effort to develop and implement literacy strategies but neither the planning nor evidence of implementation were as marked. In most provinces a matter of concern was the seeming lack of good communication between province and district, and/or between district and schools. Often, policy documents produced or mentioned at province level were not known about at the school level.

CAPS has been well received for its clarity and much needed scaffolding at all levels of the system. A key recommendation in this regard is to ensure that Curriculum Advisors (CA) are fully aware of the purpose and content of the CAPS so that they can efficiently use this information in supporting teachers. The situation with regard to the supply and availability of **reading resources** was varied across the provinces. All schools visited have some reading resources but not enough. Some teachers indicated that there were not enough workbooks and that learners had to share.

As might have been predicted, few schools visited had functioning **libraries** and some did not even have **classroom book corners**. Although there was some mention of the use of mobile libraries and book trolleys provided in some schools, there is also a pervasive need for training of teachers and principals about the importance and pleasure of reading and accessing libraries.

Scripted lesson plans emerged as a theme both in provinces where these are being used (GP and WC) and some, where they currently are not. There was a general feeling that scripted lesson plans are useful and desirable. They are certainly valued in priority schools where teachers need the most support. It was also noted, however that scripted lesson plans are only one part of effective provision, the other part being a high level of classroom coaching and support for their optimal implementation.

Support and professional development were key issues underpinning most of the other themes. It was noted that the **Curriculum Advisors** and the **Principals** play a key role in ensuring effective curriculum implementation. Thus the training, support and monitoring of these officials is an essential element of any literacy strategy. The issue of professional development of teachers is closely linked with that of the support and training of CAs and Principals. A key finding was also the very high ratio of CA to schools to be supported. In one province this amounted to 319 schools to one CA.

The audit, whilst not specifically tasked to investigate **teacher competence**, identified in almost all themes the importance of teacher skills, knowledge and attitude in relation to the implementation of successful reading programmes. Some teachers interviewed revealed a wealth of these attributes, but most indicated a need for sustained, quality training and support.

Parental involvement has been identified as a key indicator of learner achievement in South African schools. In this audit there was little evidence of systematic sustained programmes aimed at involving parents or caregivers in their children's education. GP and WC do have provincial programmes, the former focused on school-based parent workshops about reading, the latter about community advocacy. In other provinces, there was evidence of ad hoc programmes initiated by individual schools. None of the programmes seemed to be linked to any impact evaluation strategies.

The provincial support for **learners with barriers to reading** appeared to be scant, with the exception of Free State which provides one special needs teacher per phase in each primary school. This is an issue that troubled a lot of the teachers and is possibly associated with the claim made by the Deputy Director General of WC that teachers teach at the level of the weakest learners and to the pace of the slowest amongst these. Clearly this is an issue that requires support and redress.

With the exception of WC and GP, there appeared to be little engagement with **systemic assessment or evaluation of reading programmes** apart from through the ANAs. WC has consistently implemented an annual assessment and also has commissioned external evaluations. GP more recently through GPLMS has also committed to an external evaluation. Some schools are realising the importance of analysing the ANAs and of planning programmes based on this analysis, but there is need for this, and for valorization generally of research and evidence-based practice, to be embedded in provincial strategies across the country.

Recommendations

There are forty-one recommendations in the report, all of which provide specific advice as to the development, implementation, support, monitoring and evaluation of effective reading programmes in South Africa. The main recommendations are combined and focused on the provision of reading resources, availability of curriculum policies, programmes and plans in schools, a pointers for the development of a systematic approach to teacher development in teaching reading. Linked to this is an emphasis on developing a love of reading among teachers themselves.

The Report concludes with the observation that most primary school teachers claim not to enjoy reading, and that it is certainly difficult to see how teachers can instill a love of reading in their learners if they do not have it themselves. Yet, rather than railing against this, and proposing that teachers should be lectured on 'their shortcomings', the team proposes some creative ideas for schools, districts and provinces to engage in that have a high quotient of fun. Some are aimed at the learners, some at teachers, some at the whole school and wider community. These include:

- Reading festivals built around special days (Mandela Day, International Literacy Day, Mother Language Day etc)
- Readathon
- Write-athon
- Book Alive days (come to school dressed as a character in a book you like)
- Teachers' book clubs
- Teachers writing groups¹
- Learners' reading clubs²
- A visit to the municipal library
- Grannies come to read with/to learners
- Storytelling festival
- Authors' visits to schools
- Writing a school newspaper
- Group book writing competition

1 The National Writing Project has run excellent workshops in Gauteng, KZN, Limpopo, & WC

2 Nal'ibali is setting up book clubs in many provinces in the country.

WESTERN CAPE EDUCATION DEPARTMENT LITERACY AND NUMERACY STRATEGY

Brian Schreuder

Western Cape Education Department

The WCED Literacy and Numeracy Strategy is born from a need to improve the unsatisfactory performance of learners in Grades 1-6 over the last few years in the Western Cape. The Strategy prioritises the development of Literacy and Numeracy skills within a systems-wide approach.

The 2010 McKinsey Report, by Mona Mourshed, Chinezzi Chijioke, and Michael Barber, found that the Western Cape was one of the most improved systems in the world. It based this on the literacy and numeracy interventions undertaken in that Department since the early 2000s. The McKinsey Report found that three things matter in those systems that come out on top: (i) Getting the right people to become teachers; (ii) Developing them into effective instructors; and (iii) Ensuring the system is available to deliver the best possible instruction for every child.¹

The strategy pre-dates the conceptual framework provided in the *National Integrated Literacy and Numeracy Strategy, National Strategy for Learner Attainment, Action Plan 2014 and Planning Towards Schooling 2025*, but has fed into the development of, especially the *National Integrated Literacy and Numeracy Strategy*

The Strategy to improve Language and Mathematics was launched afresh in 2006 and was originally seen as a 10 year strategy until 2016. Soon it became evident that it needed a longer (25 years?) sustained strategy to entrench better practice and change mindsets of teachers, parents and society in general.

The aim of the strategy is to produce fully literate and mathematically competent GET learners who can participate fully and successfully in the FET band.

The WCED Lit/Num Strategy consists of eight programme areas and advocates five critical aspects that will make the greatest impact. These are:

- Teacher development and support
- A whole school/whole community approach within which family based literacy is key and mindsets of society towards this problem are changed

- Resource provisioning with focus on graded readers and text-rich classrooms
- Early Childhood Intervention and
- Changes to classroom practice leading to more effective teaching and learning in the classroom

These key areas are underpinned by several critical success factors such as:

- Quality in-class monitoring and support offered to schools
- The quality use of texts, time and tasks.
- Sustainability of the intervention through high-level and relentless strategic driver centrally with coordinated implementation of the strategy by all districts
- Research to inform best practice, including systemic tests to indicate reliable improvement trends and areas needing focused attention

A key focus of the strategy is teacher development and the Strategy sets parameters for the rollout of a teacher development intervention to 1 050 primary schools over an eight-year-period from 2008-2016 and involves all levels of departmental staff in that rollout. the following schedule is rolling out:

- 2009 to 2010: 250 schools (Phase One)
- 2011 to 2012: 250 schools (Phase Two)
- 2013 to 2014: 250 schools (Phase Three)
- 2015 to 2016: 300 schools (Phase Four)

A consortium of external specialists in Language and Mathematics teaching oversees the training and mentoring of WCED teachers and officials to upgrade the implementation of Language and Mathematics teaching from grades 1-6 in the province.

Through the effective delivery of this intervention, it is envisaged that there will be substantial gains in teachers' capacity to teach languages and mathematics over the next few years.

The following elements form the foundation on which the Lit/Num Intervention is built:

¹ See more at: <http://mckinseysociety.com/how-the-worlds-best-performing-schools-come-out-on-top/#sthash.WUdipKb.dpuf>
<http://mckinseysociety.com/how-the-worlds-most-improved-school-systems-keep-getting-better/#sthash.lb65QDuR.dpuf>

1) Structures

Structures have been established into the line function to establish an effective communication line to channel the Literacy and Numeracy strategy. This communication line includes;

- ◆ LIT/NUM coordinating structures that includes the following forums:
 - Provincial Management Team (all branches)
 - District Management Team (all branches)
 - School Management Team
- ◆ Curriculum structures:
 - Curriculum Strengthening Forums for Curriculum Advisors, HOD's
 - Learning Area Clusters (all teachers)

2) Resources

- All schools received Graded Reading Schemes in the Home Language and First Additional Language.
- All schools received textbooks and workbooks in Languages and Mathematics.
- All schools on the intervention will receive a comprehensive Mathematics kit(s) to support the effective teaching of mathematics.

3) Strong emphasis on the strengthening of teacher performance to support Literacy and Numeracy

Basic imperatives for schools are the following;

- Every teacher must be trained on CAPS
- Every teacher must have a plan for teaching, a record of work completed and individual learner performance records i.e. (workbooks, assessment records)
- Every teacher and learner must have a textbook and learner workbook
- Every learner must do a written exercise per lesson
- Every learner must read for 30 minutes everyday
- Every learner must do mental Maths for 10min and written Maths for 20min per day.

4) Grade 3, 6, and 9 testing

- The writing of standardised and internationally-benchmarked systemic tests forms part of the Lit/num strategy with the aim of diagnosing problems in the system, setting goals, and providing targeted support

5) First Additional Language

- The introduction of English First Additional Language is given prominence as it is critical to the success of the broader literacy and numeracy strategy. The challenge that African Language speakers face in changing medium of instruction to English in Gr 4 remains a huge obstacle

6) Grade R Teacher training

- The focus is to start the Literacy and numeracy strategy as early as Grade R through the training of Gr R practitioners on emergent Literacy and Numeracy.

7) Cape Teaching and Leadership Institute (CTLI)

- The WCED has an In-Service teacher training Institute. The CTLI offers ongoing training to teachers on Literacy and Numeracy to strengthen classroom practice.

8) Advocacy

- Annual road shows to all districts, schools and local communities are undertaken to analyse the systemic results, share best practice and set new targets.
- Schools that improve most and those that perform well are rewarded at an annual Awards Ceremony to incentivise efforts
- Schools are encouraged to create Literacy and Numeracy hubs/centres within the school to enhance the participation in Maths and reading.

9) Impact and Performance of the intervention

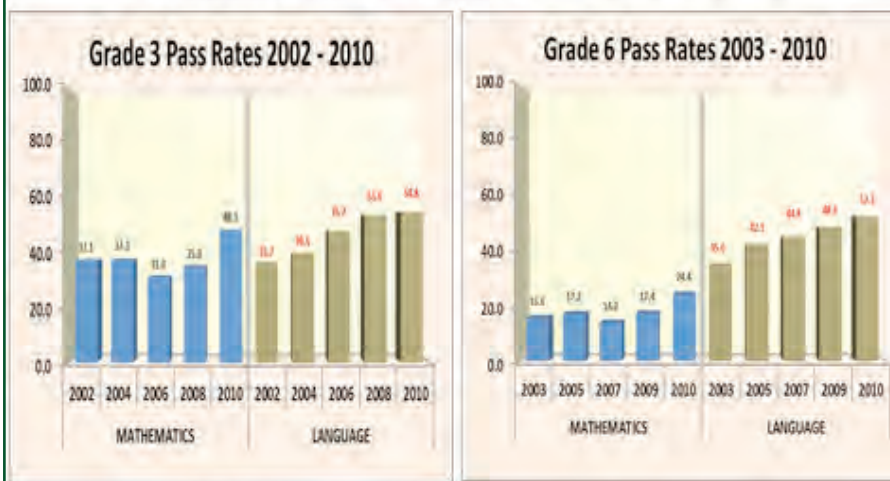
- There has been gradual and substantial improvement across all grades of pass rates and mean scores as evidenced in the annual WCED Systemic Tests. The results from 2002 to 2010 are shown below.

Impact so far... Provincial Results: 2002-2010

GRADE 3										
	MATHEMATICS					LANGUAGE				
	2002	2004	2006	2008	2010	2002	2004	2006	2008	2010
PROVINCE (Pass Rates)	37.1	37.3	31.0	35.0	48.3	35.7	39.5	47.7	53.6	54.8
PROVINCE (Mean Scores)	38.1	39.3	36.8	39.5	48.0	36.6	39.6	46.4	50.5	50.7

GRADE 6										
	MATHEMATICS					LANGUAGE				
	2003	2005	2007	2009	2010	2003	2005	2007	2009	2010
PROVINCE (Pass Rates)	15.6	17.2	14.0	17.4	24.4	35.0	42.1	44.8	48.6	52.3
PROVINCE (Mean Scores)	27.5	29.0	27.9	31.9	39.2	36.8	40.6	45.0	48.2	50.8

Impact so far... Provincial Result: 2002 - 2010



- The improvement in the Gr 3 and 6 Literacy and Numeracy performance can be ascribed to a combination of efforts executed by different stakeholders within the WCED. Key to the efforts are the following:
 - A clear and concise plan that is long-term.
 - A system-wide driven strategy that involves all levels of the department.
 - A designated champion is assigned to drive the Strategy.
 - Intense focus on teacher development in Languages and Mathematics
 - The provision of resources to support quality teaching.
 - The development of Subject Advisors for quality support to schools.
 - The introduction of standardized testing over the last number of years.

10) Sustainability of the intervention

- Districts are briefed on how to sustain the project once the intervention is complete so that the intervention becomes part of the daily focus of the district.

Lesson from the Gauteng experience of improving language and mathematics in a poorly performing schools

Brahm Fleisch

University of the Witwatersrand

In response to the President's 2010 State of the Nation address in which he set ambitious targets of 60% of learners achieving proficiency in mathematics and language by 2014 for Grades 3 and 6, the Gauteng Department of Education initiated the Gauteng Primary Language and Mathematics Strategy. Drawing on international 'change knowledge', the Strategy was designed around four pillars:

- (1) using learner achievement data (particularly the Annual National Assessments) to improve teaching and learning,
- (2) supporting teachers to improve their instructional practices,
- (3) providing support to learners directly and
- (4) developing school management teams and district support systems.

A key assumption embedded in the Strategy was that teachers needed intensive and extensive support and guidance to change their daily classroom instruction practice, and that improved instructional practices will have a substantial positive impact on learner performance. This intensive and extensive support and guidance came in the form of detailed daily lesson plans for language (both African languages and FAL English), provision of high quality learner materials including graded-readers, workbooks and textbooks, and one-on-one support from experienced and well-trained instructional coaches.

In 2011, the Strategy began implementation in 792 underperforming schools on the Foundation Phase literacy lessons. The following year, the Strategy expanded to include Intermediate Phase teachers and began to provide support in mathematics. By 2013, the Strategy at full implementation worked in 990 Gauteng schools, with over 750 000 learners and 12 000 teachers with over 480 coaches working with twelve literacy and mathematics NGOs, and 3500 homework assistance working under the banner of the Extended Public Works Programme.

To address the language and mathematics needs to the schools, the Strategy developed and revised high quality daily lesson plans covering the entire primary school Curriculum and Assessment Policy Statement for languages and mathematics, commissioned and distributed specially-developed graded readers in nine African languages (the Vula Bula Books), and designed and implemented a highly successful catch-up (remediation) programme for intermediate phase learners in FAL English.

A number of key lessons have been learnt during the first phase of implementation. First, the teachers in underperforming schools were almost unanimous in their endorsement of the detailed lesson plans. While CAPS provide much greater guidance to teachers, the GPLMS lesson plans (which are CAPS compliant) provide concrete tasks, linked to particular sets of learner materials, that are well balanced and carefully scaffolded. The lesson plans also provide teachers with insights into an extended teaching repertoire, particularly for the teaching of reading in African languages.

The overwhelming majority of teachers actively encouraged their coaches to observe their lessons, largely because the coaches had developed strong trusting relationships. Not only did coaches play the role of 'critical friends', but many demonstrated how lessons could and should be taught in the classroom with teachers observing.

After three years, there is a growing body of research that shows that teachers classroom practices are beginning to change. Teachers are spending more time teaching. They are teaching more academically challenging content. They have expanding their pedagogic repertoire. Preliminary evidence show strong performance gains, with the overall percentage of learners achieving at or above the minimum proficiency levels is going up, and more importantly, the performance gap between middle class and working class schools is narrowing.

The Rainbow Workbooks brighten our classes



Prof Veronica McKay, coordinator of the workbook project and English workbooks author, explains the rationale for the development of the workbooks and what the project aims to achieve.

Schools are currently receiving their 2014 allocations of Rainbow Workbooks for their learners. This will be the fourth year that the Department of Basic Education (DBE) has distributed workbooks to schools across the country.

Although the DBE's Rainbow Workbooks are a fairly recent innovation in South Africa, several countries around the world have been using workbooks like these for several years to assist teachers in their day-to-day teaching.

What is the aim of the workbooks?

The workbooks are intended to assist teachers and learners directly in the classroom. They aim to:

- ★ ensure that schools that lack learning resources and photocopying facilities are supported through the provision of worksheets
- ★ provide easy-to-use worksheets that are sequenced according to the sequence of the CAPS
- ★ provide a variety of activities to reinforce literacy/language skills
- ★ provide a variety of activities to reinforce mathematic skills
- ★ introduce learners to the language and concepts required for learning and understanding their other subjects
- ★ assist teachers to focus, in a targeted manner, on the skills that learners should be acquiring in each grade as outlined in the curriculum
- ★ help teachers to monitor learners' performance in key activities
- ★ prepare learners for the formats used in assessments such as the ANA.





Why were they introduced?

A range of learning assessments in mathematics and language showed that additional support and resources were needed in classrooms. In particular, the poor results in standardised tests such as the systemic evaluation and the SACMEQ and PIRLS signalled the need for a more *structured* intervention. In addition it was recognised that many learners had to share textbooks with one or more learners. Teachers tried to remedy the situation by using photocopied or homemade worksheets, but this was expensive and often challenging.

It was in response to these kinds of problems that the DBE decided to provide workbooks in the critical areas of language and mathematics from Grade R to Grade 9.

What workbooks are available?

The following resources are included in the workbook package. For practical reasons, each workbook listed below has been produced in two parts or “volumes” – one for terms 1 and 2, and a second volume that will be delivered later in 2014 for terms 3 and 4:

- ★ A workbook in mother tongue language (that is, in all the eleven official languages) for Grades 1 to 6
- ★ A mathematics Empilo ngesiZULU workbook in all the official languages for Grades 1 to 3 and in two official languages for Grades 4 to 9

- ★ A workbook in English first additional language per learner for Grades 1 to 6
- ★ Life skills workbooks for Grades 1 to 3 in all the eleven official languages
- ★ Four integrated learners' workbooks (one per term) for Grade R learners in all languages, dealing with home language, mathematics and life skills
- ★ An introductory version of Grade 1 language materials that will be available in 2014 for schools that are involved in the Incremental Introduction of the African Languages (IIAL) in the ten African languages, accompanied by Big Books and posters which will also be valuable for Grade 1 home language and FAL in English
- ★ Braille and large print books for the above.

What can teachers expect in the 2014 edition of the workbooks?

The workbooks are now in their fourth edition. Each year, the workbooks are improved according to the feedback received from learners and teachers, and research undertaken by the DBE. The 2014 edition of the workbooks is closely aligned to the Curriculum and Assessment Policy Statement (CAPS). In addition, we have made a concerted effort to include a range of reading texts to compensate for schools and homes that have limited reading materials. Shortages of reading texts are most acute in the African languages. We believe that the workbooks address this situation through the inclusion of reading texts across all the languages.

Teachers will be pleased to see that the 2014 workbooks contain a contents page and, at the end of each section, a checklist to enable learners to monitor themselves. In addition, the 2014 edition of the workbooks also includes a number of worksheets that address the specific language structure and/or conventions as prescribed in the CAPS.

How should teachers use the books?

The workbooks provide a worksheet a day for 4 days per week and for 8 weeks per term. They are aligned with the fortnightly division of the CAPS.

Teachers need to consider the worksheets in two-week chunks. The worksheets are labelled by fortnight, for example, "Term 1: weeks 3 – 5" in exactly the same way that the CAPS are labelled. Each fortnight's work contains the reading genre, activities for speaking and listening, writing and presenting as well as the necessary language structures and conventions that should be taught in the specific fortnight.

Before you start, first scan volumes 1 and 2 of the workbook you will be using to familiarise yourself with the structure, content and methodology. Note which sections of the CAPS are dealt with and decide whether you will use the workbook as core material or as supplementary material for your classes in that fortnight. Specifically focus on the way in which the workbook packages the following:

- Reading and viewing, which we call **Let's read**
- Writing and presenting, which we call **Let's write**



- Listening and speaking, which we call **Let's speak**
- Language structures and conventions, which are indicated as language exercises

In using the mathematics books, be aware of the various colour codes that are used to designate the different mathematics content (see below).

Revision

Number

Patterns

Space and shape

Measurement

Data handling

We recommend that you use the mathematics worksheets as part of a fivefold process:

1. The teacher explains key concepts.
2. The teacher refers to explanations in the textbook (if available).
3. The class carries out various oral and written activities.
4. The worksheet is used to consolidate the previous three stages.
5. This may lead to the teacher doing further teaching or remedial work.

Finding your way around the workbooks

To support teachers, we have built in various forms of guidance for using the workbooks. In the language and life skills books we have used icons to guide the teaching at various times. The icons direct learning to include the components of speaking, listening, reading and writing, in line with the CAPS.

Let's read



Reading is recognised as being very important for improving learners' ability in a language: it strengthens their vocabulary, grammar, sentence construction, paragraphing knowledge and thinking and problem-solving skills.

Accordingly, the language books include reading text and a comprehension activity in almost every alternate worksheet (usually the odd-numbered worksheets).

It was decided that the reading activities specified in the CAPS would be included in the workbooks so that the teacher would no longer need to find and duplicate reading activities in the different genres, such as newspaper articles, poems, dialogues, instructional text, e-mails, letters, web pages, narratives, fairy and folk tales, invitations, postcards, recipes and advertisements. It is then up to the teacher to decide when to use an individual, paired or shared reading approach. Care has been taken to ensure that learners follow the necessary steps in the reading process.

You will find a graphic to guide this process in the inner covers of the workbooks.



Let's write



Grade R



Grade 1



Grade 2



Grade 3



Grade 4



Grade 5



Grade 6

The workbooks thus specify the minimum amount of reading and writing learners should do and also guide the pacing thereof by specifying what should be done in each week of each term. This includes “scaffolded” essay writing, grammar exercises and long and short writing activities.

The workbooks contain a number of writing organisers that scaffold the writing process. We have included a graphic that will guide the learner through the writing process. (See the inside covers of the 2014 workbooks.)



Word work



Grade R



Grade 1



Grade 2



Grade 3

The workbooks give extensive attention to building learners' vocabulary and word usage. This is especially important in teaching FAL, where learners have to build a new vocabulary that is different from what they hear and speak every day.



Grade 4



Grade 5



Grade 6

Let's speak



Grade R



Grade 1



Grade 2



Grade 3

Children are constantly developing their listening and speaking skills both in and out of school, and not only in their literacy and language classes. Listening and speaking are crucial to all learning and it is important for your learners to develop these skills effectively. The worksheets highlight areas and times when you should involve learners in speaking and discussion activities.



Grade 4



Grade 5



Grade 6



Let's do



Grade R



Grade 1



Grade 2



Grade 3

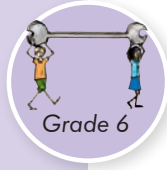
The workbooks provide “fun” activities which involve learners in carrying out a wide range of stimulating tasks, such as role plays, drawing, cutting-out activities and making posters. Learners work as individuals, in pairs or in groups. Many of the activities require the learners to use cut-outs provided at the back of the book. The FAL foundation phase books use peel-off stickers to engage learners actively in building their own picture dictionary (“pictionary”).



Grade 4



Grade 5



Grade 6

second language, particularly if they were introduced to English only in Grade 3 as has been customary. This means that the end of Grade 3, most learners will have a limited vocabulary of only 500 to 700 English words – about 10% of the vocabulary they need to be able to read and understand a Grade 4 textbook in English. (The same argument applies if the LOLT is changed to any other second language.)

To address these and similar problems, the DBE mandated that English as a First Additional Language (FAL) be introduced from Grade 1 in 2012. A series of FAL workbooks was developed, to construct a sturdy oral foundation in English from Grade 1 in order to enable learners to read and write in English in Grades 2 and 3, and thereafter so as to support the switch from learning in a first language to learning through the medium of an additional language. Special care has thus been taken in the development of the FAL workbooks to enhance learners’ acquisition of literacy and language skills for language across the curriculum so as to facilitate a smoother transition to using English as the LOLT in Grade 4.

Making monitoring easy

Most of the written work is done in the workbook and learners fill in their answers in the spaces provided. Teachers can therefore see, at a glance, whether learners are completing sufficient written activities and getting enough practice. A space is provided on each worksheet for learners to date their work and also for the teacher to sign.

What about the recent introduction of FAL from Grade 1?

We all know that the change of the LOLT in Grade 4 is problematic if learners lack the conceptual and cognitive understandings needed for learning through a second language (usually English). This is because of the considerable demands made on learners when they switch from home language to learning through a

Thinking about pedagogy

The CAPS has adopted a solidly phonetic approach to the teaching of the mother tongue. The scientific evidence is now overwhelming that the phonetic approach is the best (because the centres of the brain that handle the sounds of language are also used by the brain to decode text).

The DBE language workbooks use a simple, well thought-out sequence of exercises to teach the phonics across the foundation phase workbooks with phonics being introduced systematically at a rate of about two per week up to the end of Grade 3. The sequence for these is derived from the sequence in the CAPS.

Recent evidence indicates that learning to read at a sufficient speed rate is essential for reading with

understanding. The workbooks aim to enhance automaticity and fluency so that learners can increase their reading speed, measured in terms of correct words per minute (cwpm), necessary for comprehension.

To colour or not?

It was found, during the field testing of the workbooks, that teachers and learners were consistently positive about the use of colour. Teachers pointed out that their learners “wanted to work with colour in the workbooks”. Teachers also commented on the added pedagogical benefits of using colour, stating that the colours enabled them to refer to words in the “blue or green column”. Studies on the use of colour in textbooks are increasingly positive about the support and stimulation it provides.

Inclusive artwork

Artwork forms a critical feature of the workbooks. The artists who work with the writing team are briefed on the racial, gender and cultural composition of the drawings and each artwork is specified to ensure correctness. While the artwork is usually considered to be part of the hidden curriculum, the drawings in the workbooks were specified in great detail to make the hidden curriculum more overt in a positive sense, taking care to ensure that the artwork typified positive race, class and gender values.

Coining new language

The workbooks are available in all official South African languages. This required that teams of language experts undertook the essential task of ensuring the standardisation of terminology, particularly in the mathematics and life skills materials. In particular, the language experts were required to develop protocols for versioning – transliteration vs. coining of terms vs. borrowing of concepts – and they needed to engage in the process of standardising terminology, in consultation with the various language boards. The workbooks themselves thus contribute immensely to the development of the African languages.

Will teachers be trained to use the workbooks?

The DBE has trained subject advisors across all the provinces on how to use the workbooks. This training will be cascaded down to teachers in the various districts. In addition, a training manual has been developed to assist teachers in using the workbooks.

However, teachers and parents should find it easy to use the workbooks because of the built-in guidance in the books.



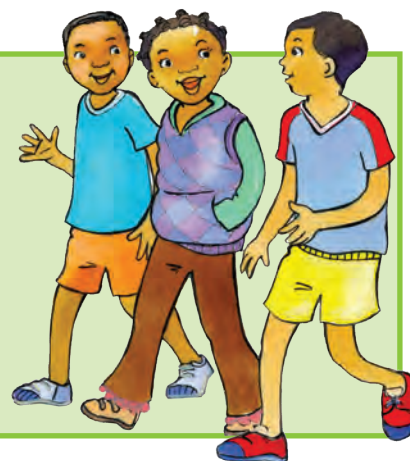


Have the workbooks been evaluated?

A recent evaluation conducted by the Australian Council for Education Research (ACER) and UNICEF on behalf of the DBE surveyed the use of the workbooks in 327 schools. The evaluation established that the majority of teachers surveyed found the workbooks to be extremely useful in helping them to focus on the core foundational skills, although some areas were flagged for improvement. In the absence of training for teachers on how to use the workbooks, it was found that teachers used the books *differently* – some used them as the main component of teaching, while others used them as supplementary to their lesson for the day, and yet others as homework books – most of the learners actually took the workbooks home every day.

What about the learners?

Learners themselves found the workbooks useful because the structure of the books helped them to understand the content. They also said the icon directions enabled autonomous learning. As one young learner stated: “In subjects without workbooks you really have to rely on just the teacher, in subjects with workbooks you can work alone from the book.”



How do parents find the workbooks?

The ACER survey showed that parents found the books valuable in helping them to monitor homework and to “know what their children were learning at school”. It was found that parents who themselves lacked a high level of literacy skills regarded the workbooks as valuable tools that enabled their children to get access to a better education, a privilege which many parents were denied. As one parent put it, “It helps us as parents, it teaches us what the children are learning in school. It is almost as if we are participating.” While parents themselves found the workbooks interesting, informative and easy to understand, they noted the following with regard to their children’s experience:

- ★ The workbooks stimulated their children’s interest in learning and school work.
- ★ There was an improvement in their children’s understanding of subject matter, especially in mathematics.
- ★ There were changes in their children’s attitude and behaviour towards homework.
- ★ Their children showed increased confidence, motivation and focused attention when using the workbooks.
- ★ Children took pride in the work that they did in their workbooks.



TEXTBOOKS ARE ON LOAN AND MUST BE RETURNED!

LEARNING AND TEACHING SUPPORT MATERIAL (LTSM) RETENTION AND RETRIEVAL

The last phase of the implementation of the Curriculum and Assessment Policy Statement (CAPS), namely, the Grades 7-9 and 12, will be completed in 2014. The academic year 2014 will therefore see the completion of the overhaul and phased-in introduction of new textbooks for the CAPS for grades 1-12.

Since 2008 up to the end of the 2012-2013 financial year, Government has spent approximately R13.4 billion on the provision of textbooks and stationery, excluding the LTSM funds transferred to Section 21 schools. While new textbooks have been provided since the introduction of the National Catalogues and the roll-out of the CAPS, a considerable amount is spent every year on top ups. Given the Department's goal of providing a textbook for every learner for every subject in the schooling system, and coupled with the cost of providing these textbooks, it has become essential that everyone in the education sector takes responsibility for ensuring that the textbooks that are provided are looked after, protected and recovered at the end of each year. Every school, teacher, learner and parent should aim to ensure all textbooks that are handed out at the beginning of the year are recovered at the end of the year – and to aim for 100% recovery!

School Governing Bodies are called upon to support school principals in implementing a Textbook Retention Plan and ensuring 100% textbook retrieval. At the beginning of every school year, learners and parents need to be reminded that textbooks handed out to them are in fact the property of the school and need to be handled with care and kept safe. Learners must be reminded also that as textbooks are on loan they should not write in them or damage them in any way. Some schools even require learners to cover all their textbooks as soon as they get them.

STRENGTHENING LTSM RETENTION AND TEXTBOOK RETRIEVAL

To achieve effective textbook retention each school must develop and implement a **Textbook Retention Plan**, which must include the following elements:

(1) Maintaining and Recording in the school's textbook inventory:

When LTSM is delivered to the school, titles and quantities must be entered into the school's textbook inventory. All books should have a clearly identifiable number with the school stamp.

(2) Issuing of LTSM.

At the beginning of the school year, learners must sign for each book issued to them on a list against each book's number. Each learner must have a booklist that must be signed by the learner and parent/guardian. A parent/guardian must sign an undertaking to replace lost or damaged books. Signed booklists must be kept in the school's safe room by the LTSM Committee. Books should be covered to extend their life span.

(3) Inventory checks.

The school must conduct an inventory check by holding a textbook check day at least once per term to check for missing and worn-out books against the list. In the case of missing books, parents must be informed and asked to replace them or pay their replacement value. Book accounts must be sent to parents.

(4) LTSM audit.

The school principal must conduct an audit of all LTSM at least once per year. The results of stock-taking must be able to identify the shortfalls for the following year. Records of lost and worn out LTSM must be kept.

(5) Retrieval.

At the end of the school year, books must be handed in to the subject/class teacher on a specified day. The teacher must check each book against the book's number and the learner's name. Alternatively, the textbook committee could collect textbooks that learners return to the book room, using the booklists.

(6) Record keeping and reporting.

A school textbook inventory must be used to keep a record of books that are lost, paid for and replaced. The inventory must be updated at the end of the year to reflect books lost, books replaced, books purchased, books written off as damaged or obsolete and finally stock on hand. After the completion of the textbook stocktaking, the LTSM Committee must report to the principal on the number of books issued and the number returned for each title. The overall percentage of books returned must be calculated. The report must conclude with recommendations on how to raise the percentage of books returned in the following year.

(7) Disposal process.

A process must be in place in order to dispose of all damaged/obsolete LTSM. The LTSM Committee of the school must enter all damaged and obsolete items in a disposal register. Once authorised by a designated authority, the disposal process can be followed.

(8) Reporting.

By the end of the school year, schools must report to the District on the percentage of textbook retention for the current academic year, citing reasons for the non-return of textbooks and plans to retrieve outstanding textbooks and improve textbook retention in the following year.

(9) Monitoring.

The District/Circuit Official will be responsible for ensuring that the schools establish a Textbook Retention Plan and implement it effectively. In addition, they must undertake periodical checks on LTSM to ensure effective use and safekeeping. The provincial LTSM official must be responsible for confirming that effective monitoring of LTSM management and annual stock-taking is done at school level.

To drive this matter, the DBE has already provided guidance to provinces. A circular communicating responsibilities of PEDs, District Managers, LTSM Managers, school principals and school governing bodies was sent to all stakeholders.

Schools have been instructed to implement systems of ensuring that learners accept responsibility for the books that have been issued to them on loan to return them in order to ensure that a 100% textbook retrieval rate is achieved.

District offices have been requested to ensure that schools establish a Textbook Retention Plan and implement it effectively and that effective monitoring of LTSM management and annual stock-taking are done at school level. Provincial LTSM officials are to work with the District officials in this regard.

Retaining textbooks in the school system for the stipulated period of five years requires the effective annual retrieval and maintenance of books. While workbooks are renewed annually, complementary LTSM such as reference works should have a lifespan of more than five years.

Schools are expected to report to the District offices on the percentage of textbook retention by the end of an academic year, giving reasons for the non-return of textbooks and plans to retrieve outstanding textbooks and improve textbook retention in the following year.

District Offices should consolidate the reports from schools and provide a consolidated one to the provincial LTSM managers who in turn will consolidate a provincial report and provide it to the DBE by the middle of February of each school year.



The Dinaledi Schools Project

– A retrospective 2001 - 2013 –

South Africa's education system is facing a major challenge in increasing its output of matriculants with university-entrance mathematics and physical science passes. While the country has seen spectacular growth in secondary school enrolment since 1994, the focus is moving to strengthening the quality of education and increasing in the number of matriculants who have strong foundations in mathematics and science.

Since 1994 South Africa has achieved almost 100% enrolment in primary and secondary schooling, with the participation rate among girls being among the highest in the world.

The matriculation pass rate increased from 58% in 1994 to 65% in 2007 and 74% in 2012, but at both secondary and primary level the country's performance in mathematics and science lags way behind that of other countries.

In 2004, only 2 percent of students in former (African) Bantustan schools, compared to 14 percent in former (white) House of Assembly (HoA) Schools, enrolled in Higher Grade physical sciences. Only 43 percent passed in Bantustan schools compared to 86 percent in HoA schools. The number of matriculants passing grade 12 with a pass in mathematics increased from 88 000 in 1995 to 140 000 in 2007. There has been huge growth in African matriculants, from a small elite of 12 000 in 1954 following the passage of the Bantu Education Act in 1953, to about 400 000 full-time candidates in 2012.

National strategy

In 2001 Cabinet adopted the National Strategy for Mathematics, Science and Technology Education (NMSTE). In 2005 the national strategy set itself the goal of doubling the number of learners passing high-level (higher grade) mathematics and science to 50 000 by 2008.

What is the Dinaledi schools initiative?

In 2001 the Department of Education established the Dinaledi School Project to increase the number of matriculants with university-entrance mathematics and science passes. The strategy involves selecting certain secondary schools for Dinaledi status that have demonstrated their potential for increasing learner participation and performance in mathematics and science, and providing them with the

resources and support to improve the teaching and learning of these subjects.

The programme started with 102 schools in 2002-2004. Over the years, a number of under-performing schools were removed from the project. 77 of the original 102 schools were retained when the project was expanded to 400 schools in 2006. Similarly, in 2007, 371 of the 400 schools were retained when the number of Dinaledi schools grew to 488. Subsequently, the number of schools was increased to 500 in 2008. In 2008, 314 000 grade 12 learners enrolled to write mathematics in the National Senior Certificate. Of these, 55 000 were in Dinaledi schools. This represented 17% of the total number of learners enrolled for mathematics in the public school system.

The purpose of the Dinaledi Schools Conditional Grant is:

- increase the number of learners and improve performance of learners taking mathematics, physical sciences and life sciences to grade 12, with a particular focus on female learners, in line with the National Strategy for Mathematics, Science and Technology Education (NSMSTE 2002).
- Continually to increase performance of learners and teachers in underprivileged schools presenting candidates in Grade 12 for the subjects mathematics, physical sciences and life sciences
- To improve the content knowledge, pedagogies and didactic skills of mathematics, physical sciences and life sciences teachers.

Project implementation

In terms of the constitutional allocation of powers, the selection of Dinaledi schools is a competence of provincial education departments in collaboration with the national department. This has led to some unevenness in the implementation of the Dinaledi project, with procedures for adding or excluding schools not being applied uniformly across provinces. In some cases schools were not allocated sufficient mathematics teachers and learning materials and some provinces had too few subject advisors to support the Dinaledi schools in their provinces.

In order to implement the Dinaledi programme more consistently throughout all provinces, Minister Angie Motshekga through the DBE, motivated for National Treasury to provide funds through a conditional grant. The amount provided in 2011, the year of the grant's inception, was R 70 million. R97 million was allocated for use in the 2012/13 year and the 2013/14 allocation being R105 million. Under-spending of these funds transferred to provincial education departments is significant, albeit relatively small, with almost 90% of the compounded annual total of transferred funds actually being expended.

To further enhance the efficiency of the grant's implementation, the DBE created a dedicated Dinaledi Unit to more efficiently and effectively manage and monitor the provincial implementation of the grant's outputs.

Private sector organisations have been encouraged to 'adopt' Dinaledi schools in order to strengthen the levels of resourcing and other support available to them, and the Dinaledi Unit has developed a framework to guide the process of 'school adoption'.

The grant is intended to increase the **participation and success rate** of learners in Mathematics and Physical Sciences in the Dinaledi schools as well as the participation and success rate of **girl learners** in the Dinaledi Schools. Performance indicators are derived from the most recent national and provincial targets. Estimates published in the ENE for 2012 were set at 8 000 passes in science - the number of candidates that passed was 13 651. Estimates for Mathematics were set at 17 000. The number of candidates who passed was 24 316. These 'targets' were used by National Treasury for 'measurement purposes' and are not the same as those targets set for National and Provincial performance.

Support provided through the Dinaledi programme

The Conditional Grant is a source of ring-fenced funding that is specifically focussed on providing the following types of support:

- apparatus and consumables to schools that lack a functional sciences laboratory and assist schools with the acquisition of an appropriate, dedicated physical structure where needed
- geometry sets and calculators
- Information and Communications Technology (ICT) hardware, software, internet connectivity and a dedicated physical structure

- access to appropriate educational television broadcasts, including but not limited to the provision of TV sets, decoders and receiving dishes
- content, didactic and pedagogic programmes to improve teacher effectiveness in mathematics, physical sciences, life sciences and English First Additional Language (FAL).
- management training and/or mentoring for principals and school management teams
- co-curricular, additional preparation of Grade 8-11 learners for participation in Olympiads and increased access to science clubs, science fairs and competitions
- clearly defined incentives for learners, teachers and/or schools that achieve or exceed agreed upon performance targets

Conclusion

As the only National initiative for systemic (piloting of) improvement in MST, investment in Dinaledi schools must be able to show not only improved quality and quantity of results at Grade 12, but also be able to attribute, on a well-conceived, rational basis, the reasons for substantive improvement (or lack thereof).

The Department of Basic Education is optimistic that the Dinaledi programme is beginning to bear fruit. Ultimately joint coordination of private sector support for Dinaledi schools must provide the platform for shared engagement, through which companies can increase their participation in the implementation of the National Strategy for Mathematics, Science and Technology Education.

The Dinaledi Unit is accessible by email at Dinaledi@dbe.gov.za; the Unit Director, Mr David Silman may be contacted directly on 012 357 4074 or by e-mail at silman.d@dbe.gov.za.

Details of the 500 schools included in the programme as well as a number of relevant documents are available on the internet. To access the DBE homepage, <http://www.education.gov.za/> and click on the name 'Dinaledi' on the left hand side of the homepage. You will be redirected to the Dinaledi web page on the DBE's Thutong portal.



Investigation into Provincial Implementation of the Maths, Science and Technology Strategy

In 2013 the Minister appointed a task team to conduct an Investigation into the Implementation of the Mathematics, Science and Technology Strategy. The brief was to investigate the implementation of programmes in provinces to identify what has and has not been implemented, identify strengths and weaknesses, monitor Grade 9 interventions, use of workbooks, teacher resource centres and competence of teachers. It was expected to make recommendations on the nature of support that the DBE could provide to provincial departments to strengthen implementation.

The Team was chaired by Professor John Bradley of Wits University's RADMASTE. It included Dr Agnes Chigona (CPUT), Jacobus van Wyk (MUSTEK), Paddy Padayachee (former DDG GDE), Philip Dikgomo (KZNDBE), Marlene Sasman (WCDBE), Margaret M Ramakgopa (teacher), David Kramer (Sci-Bono), Catherine B Hastie (consultant), Prof Sadha Moodley (consultant), Ms M Ramohapi (DBE Secretariat). Dr David Sekao, Dr Aaron Nkosi and Mr Jabu Hlakula from the DBE provided support to the team.

The team studied the national and provincial strategies and engaged with provincial education departments by means of visits to the provinces. Interviews were held with many teachers, heads of MST departments at schools, district officials and head office officials. The interviews were supplemented by detailed questionnaires about the implementation of MST in schools.

The evidence gathered showed that there is similarity across the provinces, both in their strategies and the limitations of their implementation. It was evident to the task team that while the objectives and the strategies are laudable, the human and financial resources provided to achieve the objectives are inadequate. The result has been that none of the strategies has been implemented as planned. This has led to increasing frustration and demotivation and undermined any fresh attempts to address the situation through new initiatives.

The Report notes that the private sector has mounted independent, uncoordinated, unaligned and mostly low impact interventions. This represents a serious waste of potentially very useful resources.

The report makes a series of recommendations. These include the establishment of :

1. A dedicated MST Strategy Office.
2. A teacher development and support programme.
3. A resource management programme.
4. The Dinaledi Programme

In a situation of multiple objectives and scarce resources the Report argues for the Department to prioritise and develop plans that can be implemented substantially and successfully. The team therefore recommended that national and provincial departments first agree on priorities. The next critical priority has to do with teachers and teaching related issues.

Since the Department received the Report it has been widely circulated and discussed in provinces and districts and plans have been developed for greater alignment of the strategy and planning processes. Processes are also in motion for the establishment of a central office to deal with Mathematics, Science and Technology. The Report is available on the website: www.education.gov.za



A NEW, MORE PRACTICAL CURRICULUM FOR OUR TECHNICAL HIGH SCHOOLS

Schools have an important part to play in developing the academic, technical and social skills of learners to enable them to play a meaningful part in social and economic life. Few people are aware that South Africa has 1007 schools that offer a technical subject and 171 that can be called technical high schools as they offer two technical subjects and engineering graphics. This is a tiny number out of a total number of 24,136 public schools. And yet they offer vital opportunities to pursue a technical education to many learners.

A new curriculum for technical high schools was recently made available for public comment. This is a major step forward, alongside their recapitalisation that began in 2010. Both are a response to the burning skills needs of the country and the call of the National Development Plan and the Skills Development Plan for more and better qualified people with technical and technological skills.

Background: RNCS of 2002

One of the apartheid inheritances was a very divided and unequal system. A wide variety of technical subjects was offered across schools that were unevenly equipped with workshops and equipment. In order to unify and equalise them, the Revised National Curriculum Statement of 2002 condensed these subject offerings into three main subject areas between which schools and learners could choose: Electrical Technology, Civil Technology and Mechanical Technology. Learners were also required to take Maths and Science alongside the overarching technical subjects of their choice.

Although a laudable goal, in practice it meant that teachers now had to cover material, even within one subject, that they might not know and then only very superficially. Schools that had teachers able to teach woodwork, for example, were now expected to cover a much wider spread of knowledge and skills than they were trained to teach. The requirements to study Maths and Science also posed formidable challenges for some of the students enrolled.

The immediate result was declining enrolments. From a high of 100,000 in 2007, numbers declined to 65,000 in 2010 and 43,000 in 2012. Declining enrolments were accompanied by concerns expressed by industries and technical schools themselves.

During this period, the recapitalisation process began. And in March 2013 a Ministerial Committee was appointed to investigate and propose how the curriculum could be made more realistic for schools.

2013 Revision

The Ministerial Committee appointed in 2013 consisted of Ms Penny Vinjevold, the Superintendent-General: Western Cape Education, Mr Ben Ngobeni, the Superintendent-General: Gauteng Education, Dr Nhlanhla Nduna-Watson, responsible for Curriculum Implementation and Improvement (FET) in the national Department of Basic Education, Prof H Jeffery from the Engineering Council of South Africa (Chairperson), Ms N Ngcobo from the University of Witwatersrand, Mr M Matlala of the South African Agency for Science and Technology Advancement and Ms A Oberholzer from the Independent Examination Board.

A smaller team under the direction of Prof Jeffery took forward the actual recrafting of the curriculum. In re-designing the curriculum, the team took care to ensure articulation with and not duplication of FET College curricula.

The broad aims of the proposed new curriculum for technical high schools remain similar to those of the NCS. These are to develop high levels of engineering and technology knowledge and skills, prepare learners for the world of work or self-employment or to pursue engineering fields in higher education. The curriculum strives for the integration of theory, practice and reflection. Mastery of technical skills is considered as important as exposing students to entrepreneurial opportunities. Thus the practical component is given appropriate assessment weightings.

The main difference of this re-designed curriculum of 2013 from the old 2002 curriculum is that each of the overarching technology subjects now offers three specialisation areas. Schools can choose one or two specialisations within a subject or one each within two subjects, for example. This enables a school to teach what it has the capacity to teach.

In addition, Technical Mathematics and Technical Science are introduced as alternative subjects for those learners who are struggling with pure Mathematics and Physical Science. These two subjects will only be offered by the schools that have been declared as technical schools and will not be extended to other academic schools in the system. Mathematics and Physical Sciences will continue to be offered at technical schools in addition to the two new subjects.

Accordingly:

- (i) Civil Technology provides for the following areas of specialisation:
- Construction,
 - Woodworking, and

- Civil Services (e.g. Sewerage systems, etc)

- (ii) Electrical Technology provides for the following areas of specialisation:

- Power Systems,
- Electronics, and
- Digital Systems.

- (iii) Mechanical Technology provides for the following areas of Specialisation:

- Automotive,
- Fitting and Machining, and
- Welding.

The subject engineering and graphics design (EGD) will continue to be offered at all technical schools.

Assessment

The following model for specialisation indicates the subject weighting content at each grade:

Subject	Areas of Specialisation	Grades 10~12	Subject Interdisciplinary component	Subject Specific Component
Civil Technology	Construction	Grades 10	70%	30%
		Grades 11	50%	50%
		Grades 12	30%	70%
	Woodworking	Grades 10	70%	30%
		Grades 11	50%	50%
		Grade 12	30%	70%
	Civil Services	Grades 10	70%	30%
		Grades 11	50%	50%
		Grade 12	30%	70%

As part of the end of year examination Grade 10~12 learners will do a Practical Assessment Task (PAT) that will contribute 25% towards the examination mark. This provides for the assessment of the application of knowledge and skills in a particular field.

Each subject will have one paper with four sections. Thus for example, Civil Technology at Grade 10 will have four sections: a generic section compulsory for all learners, a section on construction, a section on civil services and another section on woodworking. Learners will write Section A, which is compulsory for all learners, and one specialisation area depending on the specialisation offered at a particular school.

Looking Ahead

Not all schools are equally equipped to provide technical and technology subjects, and so considerable planning is required to ensure that implementation will proceed with the requisite facilities, teachers and enrolments in place. The recapitalisation grant has been reviewed to now include teacher training for all technical subjects at all schools. The training will focus on orientation to the revised curriculum and further emphasise the teaching of practical methodologies in a workshop environment. To this end, provinces will conduct an audit of the schools to ensure that schools offering technical subjects will be able to sustain and maintain the capacity.

The department envisages preparing the system by approving the revised curriculum by January 2014, finalising the auditing of schools by April 2014, training teachers between August and December 2014 and also commencing with the development of the required learner teacher support material (LTSM) within the same period. It is further planned that the actual implementation of the revised curriculum at grade 10 will be effected once all the necessary processes have been completed to ensure that an effective implementation is achieved.