Improving education, training and innovation

KEY POINTS

- The South African education system needs urgent action. Building national capabilities requires quality early childhood development, basic education, further and higher education.

- Early childhood development should be broadly defined, taking into account all the development needs of a child, and provided to all children.

- The priorities in basic education are human capacity, school management, district support, infrastructure and results-oriented mutual accountability between schools and communities.

- Further Education and Training colleges, public adult learning centres, sector education and training authorities, professional colleges and Community Education and Training Centres are

important elements of the post-school system that provide diverse learning opportunities.

Further education should expand moderately, and as quality improves/expands rapidly, higher education should incorporate a range of different institutions that work together to serve different priorities, including effective regulatory and advisory institutions.

Distance education, aided by advanced information communication technology, will play a greater role in expanding learning opportunities for different groups of learners and promote lifelong learning and continuous professional development. Private providers will continue to be important partners in the delivery of education and training at all levels.

Research and innovation by universities, science councils, departments, NGOs and the private sector has a key role to play in improving South Africa's global competitiveness. Coordination between the different role-payers is important.

INTRODUCTION

This chapter focuses on sub-sectors of the education, training and innovation system:

- Early childhood development
- Basic education
- Post-school
- The national research and innovation system.

It offers a vision, discusses challenges, and presents proposals in each of these sub-sectors. The work done by the Department of Basic Education (DBE) and Department of Higher Education and Training (DHET) in developing plans, strategies, programmes and policy initiatives has informed this chapter.

The chapter draws on the *Action Plan to 2014: Towards the Realisation of Schooling 2025* (DBE, 2011). The proposals in the *Green Paper for Post-School Education and Training* (DHET, 2012) were also taken into account. Many of the proposals in this chapter are already being implemented or under consideration by the relevant departments. Where the commission is making new proposals these will need to be tested before being adopted as policy.

2030 VISION

By 2030, South Africans should have access to education and training of the highest quality, leading to significantly improved learning outcomes. The performance of South African learners in international standardised tests should be comparable to the performance of learners from countries at a similar level of development and with similar levels of access. Education should be compulsory up to Grade 12 or equivalent levels in vocational education and training.

The education, training and innovation system should cater for different needs and produce highly skilled individuals. The graduates of South Africa's universities and colleges should have the skills and knowledge to meet the present and future needs of the economy and society.

Innovation is critical for introducing new products into the market and producing goods and services more efficiently. Research and development should be significantly expanded. Collaboration across the South African education system and with internationally accredited institutions should lead to higher levels of innovation.

The education system will play a greater role in building an inclusive society, providing equal opportunities and helping all South Africans to realise their full potential, in particular those previously disadvantaged by apartheid policies, namely black people, women and people with disabilities.

The different parts of the education system should work together allowing learners to take different pathways that offer high quality learning opportunities. There should be clear linkages between schools, FET colleges, universities of technology, universities and other providers of education and training. There should also be clear linkages between education and training and the world of work.

The single most important investment any country can make is in its people. Education has intrinsic and instrumental value in creating societies that are better able to respond to the challenges of the 21st century. Lifelong learning, continuous professional development and knowledge production alongside innovation are central to building the capabilities of individuals and society as a whole.

South Africa has set itself the goals of eradicating poverty, reducing inequality, growing the economy by an average of 5.4 percent, and cutting the

unemployment rate to 6 percent by 2030. Education, training and innovation are critical to the attainment of these goals.

Higher levels of education, skills, research and innovation capacity are also required for:

o The transition to a low carbon economy and meeting the greenhouse gas emission targets
o Tackling health challenges
o Developing new and utilising existing technologies
o Taking advantage of the opportunities that arise from economic growth.

South Africa needs engineering skills to deliver the massive infrastructure programme announced in the 2012 State of the Nation address. The country also needs enough doctors, nurses and health professionals in different occupational classes to deliver quality healthcare. Critically, the pool of researchers needs to expand and their productivity needs to increase significantly. Innovators are going to play a critical role in creating new products and new ways of producing existing products cheaply and more efficiently, including the delivery of public services.

Building national capabilities requires quality early childhood development, schooling, college, university and adult education and training programmes. Research institutions and the national science and innovation system must be coordinated and collaborative.

FIG 9.1 EDUCATION AND TRAINING PROVIDERS IN SOUTH AFRICA

Early childhood development	Primary education	Secondary education	Post school
• Public centres • Non-profit centres • Private centres • Corporate foundations	• Public schools • Independent schools • Home schools	• Public schools • Technical high schools • Independent schools • Home schools	• Universities • Universities of technology • Private higher education institutions • Public further education and training colleges • Private further education and training colleges • Workplace training providers • Non Profit Organisations • Public & private adult learning centres • Professional colleges

EARLY CHILDHOOD DEVELOPMENT

The benefits of intervening early in the lives of children include:

o Better school enrolment rates, retention and academic performance
o Higher rates of high school completion
o Lower levels of antisocial behaviour
o Higher earnings
o Better adult health and longevity.

Improving early nutrition has been shown to increase school attainment by up to one grade and adult earnings by up to 40 percent. Early childhood development is critical for children to reach their full potential.

As envisioned by the 2001 White Paper on Early

Source: Adapted from The Lancet 2007 [1]
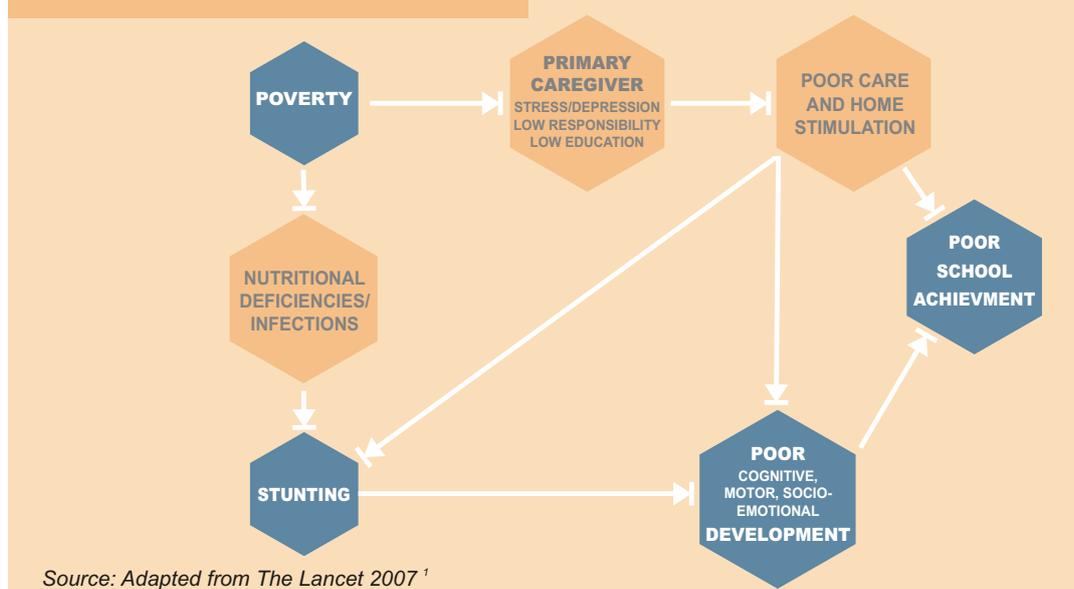
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PROGRESS IN ASPECTS OF
EARLY CHILDHOOD DEVELOPMENT PROVISION

South Africa is doing very well in some spheres:

- 87 percent of households with a young child have access to safe drinking water
- 82 percent of households with a young child are connected to mains electricity
- 97 percent of pregnant women attend at least one antenatal clinic
- 89 percent of children are fully immunised at one year old
- 83 percent of births are registered
- 73 percent of eligible young children receive the child support grant
- 83 percent of children are enrolled in Grade R, remarkable progress over the last decade in expanding access to Grade R.

Source: *Diagnostic Review of Early Childhood Development, 2012* & various DBE reports

For many South African children life is a constant struggle from a very young age. The coverage of quality early childhood development services is uneven. Apart from health services, early childhood development services below Grade R are mainly provided by private for-profit operators, community-based organisations and large non-governmental organisations (NGOs). Through a family income means test, a per-child subsidy is provided to registered centres. This covers over 400 000 children. However, because early childhood development is still privately provided, registered centres are unevenly distributed and do not yet reach the most vulnerable poor children, especially in rural areas. Fees also inhibit the poorest families from using what services are available. Early childhood development programmes need to expand, with government support, to reach all vulnerable children, including children with disabilities.

Life chances are shaped before birth. There are 2.8 million households and 11.5 million people who are vulnerable to hunger, over 72 percent of whom live in rural areas. Poverty affects the health, dietary habits and health care of pregnant women.

Nationally, stunting affects almost one in five children (18 percent), with higher levels of stunting in rural areas (24.5 percent), and urban informal areas (18.5 percent). About one in 10 children (9.3 percent) are underweight, reflecting the severity of child under-nutrition. Children, pregnant and breastfeeding women and those living with tuberculosis (TB) and HIV/AIDS are most at risk.

Micronutrient deficiency is also a problem. One in four women lacks vitamin A and about a third of women and children are iron deficient. A third of preschool children are vitamin A deficient, 21.4 percent are anaemic and 5 percent suffer from iron-deficiency anaemia. About a third of very young children do not get enough food and nutrition, affecting their growth, health, cognitive development and full participation in society. Nowhere is this more evident than in South Africa's poor schooling outcomes and low skills base.

Nutrition programme for mothers and infants

Children entering primary school in 2012 will be working in 2030. How healthy they are, how well they function, how well they do at school and in the labour market depends on the decisions the government and all in society make now.

Bhutta, et al highlighted the 1 000-day window of opportunity from pregnancy to 24 months as a critical period in the development of a child. Essential early measures to give each child a better start in life can be delivered through a two-year programme for mothers and infants including:

- Vulnerable caregivers
- Adequate nutrition including micronutrients
- Immunisation
- Protection from destitution
- Care and stimulation.

The Department of Health interacts with pregnant women, new mothers and young children as part of its antenatal and postnatal services. It is well placed to lead on health care and nutrition, with support from the Department of Social Development through home and community-based services. The primary health care strategy for child health in South Africa, Integrated Management of Childhood Illness (IMCI) has a Care for Child Development (CCD) module that supports mothers and other caregivers to stimulate children's development through age-appropriate language and play. An expansion of IMCI and CCD should be piloted as part of the broader effort to improve early childhood development.

Universal access to early childhood development

In 2030 in South Africa, there will be about 4 million children under 3, nearly 2 million in the 4–5 years age group and just under 1 million 6-year-olds. The majority of these children will be in urban areas, but there will also be a significant number in rural areas. Plans for early childhood development infrastructure and services need to differentiate between the needs of urban and rural areas. There are differences in these areas that require customised approaches.

The interventions should be different for children of different age groups. The youngest (0–3 years) are best served through clinic, home and community-based programmes that focus on working with families. 4–5 year old children benefit from some structured learning in group programmes.

The quality and coverage of early childhood development services for children aged 0–4 is poor. Grade R is currently the strongest element of preschool learning and support. It links early childhood development services to primary schools. This method should be extended to include four and five year olds. But it would have to build on a firmer foundation of child nutrition, health and development from pregnancy to three years of age, without which children will not be able to take advantage of an expanded preschool experience.

Early childhood development services should be flexible, and responsive to the needs of children, families and communities. Some services need to be targeted directly at children, while others provide support to their primary caregivers.

It is also essential that everybody has access to services of a consistently high standard regardless of who they are and where they live. Specific consideration should be given to the most vulnerable children – those who are living in poverty, at a great distance from existing services, or with disabilities.

Universal access to quality early childhood development for children aged 0–3 must be made available and have a strong nutrition and educational focus. Although early childhood development may continue to be provided through the private sector, a stronger role for the government is essential.

The central challenges include:

- Funding for infrastructure and staff
- Training for teachers
- Learner support materials and equipment
- Strengthening of support agencies
- Reaching the most vulnerable children and families
- Ensuring that departments responsible for different aspects of early childhood development work together.

Proposals for early childhood development

- Make early childhood development a top priority among the measures to improve the quality of education and long-term prospects of future generations. Dedicated resources should be channelled towards ensuring that children are well cared for from an early age and receive appropriate emotional, cognitive and physical development stimulation.

- Broaden the definition of early childhood development, taking into account all the development needs of a child. Use the expanded definition as the basis for all strategies.

- Make 2 years of quality preschool enrolment for 4 and 5 year olds compulsory before Grade 1.

- Define and phase in a comprehensive package of services for all young children.

○ Address the coordination weaknesses between the different sectors and departments responsible for early childhood development services in order to strengthen collaboration. The Commission will work with the respective departments to find a solution to the perennial coordination challenge in the delivery of early childhood development services.

○ Standardise the guidelines, norms and standards for early childhood development programmes. The Department of Basic Education has a set of guidelines for the planning of public schools, which also sets out requirements for Grade R facilities. The Department of Social Development published regulations in 2009 that set out national norms and standards for drop-in centres in terms of the Children's Act of 2005. These guidelines, norms and standards must be standardised and should take into account the needs of children with disabilities in all communities.

○ Encourage innovation in the way early child-hood development services are delivered. Home and community-based early childhood development interventions should be piloted in selected districts. Financing for this initiative could involve working closely with foreign donors and private sector fund-ers. External finance is useful as a way of piloting new

initiatives not for basic funding of early childhood development programmes, which the state must provide.

Improve state funding for early childhood development. Current funding mechanisms are not adequate for the expansive early childhood development programme reflected in this plan. It is important to test and develop funding models that cover the comprehensive package of services.

Strengthen coordination between departments, as well as the private and non-profit sectors. Focus should be on routine day-to-day coordination between units of departments that do similar work. Officials who work on issues that affect children should find effective ways to deliver programmes and resolve problems across departments and sectors rather than wait for coordination at the level of directors general.

Invest in training early childhood development practitioners, upgrading their qualifications and developing clear career paths.

Provide governmental support for training, resource and other intermediary agencies so that they can support community-based programmes.
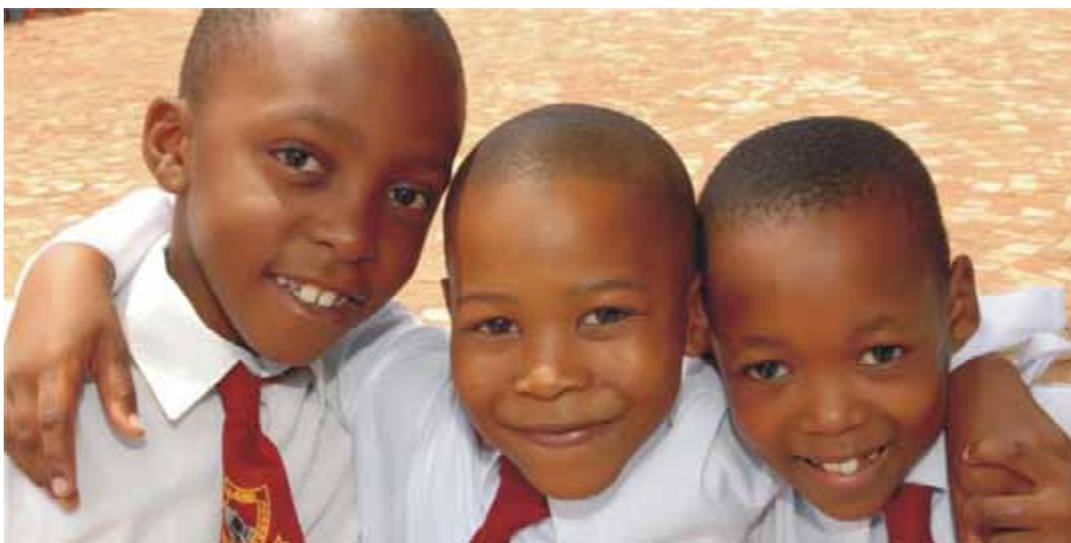
Institutional architecture

The primary purpose of early childhood development will continue to be comprehensive support for the holistic development of young children and their families. This requires the convergent efforts of several departments and depends on a strong coordinating mechanism. While the departments of health, basic education and social development lead in providing services for young children, poor vulnerable families also depend on the efforts of the Department of Home Affairs for their children's birth registration in order to access state support, the Department of Human Settlements for housing subsidies, and the Departments of Energy and Water Affairs for basic services.

The state is responsible for ensuring that all vulnerable families receive a comprehensive package of early childhood development services. There should be a policy and programme shift to ensure that the Department of Basic Education takes the core responsibility for the provision and monitoring of ECD. Other departments should continue to provide services in a supportive capacity. Resource allocation should gradually reflect the changes in institutional responsibility for early childhood development.

BASIC EDUCATION

South Africa's school education successes over the last 18 years have largely been in:

- Providing universal access to educational opportunities for the majority of learners
- (97% participation for the cohort 7 to 15 years, and 83% for 16 to 18 year olds, including further education institutions)
- Improving infrastructure
- Equalising resource allocation
- Providing free education to learners from poor households through fee exemption and the no-fee policy
- Expanding the nutrition programme to

6 million learners.

- The major shortcoming is the quality of school education outcomes.
- The main contributory factors include:
- Human capacity weaknesses in teaching, management and school support (district offices)
- The language skills of learners
- The lack of cooperation between key stakeholders, particularly unions and the government.

Attempts to address school education challenges have been characterised by blame and a lack of accountability.

The National Development Plan is aligned with the Department of Basic Education's *Action Plan and Vision for Schooling in 2025* in both its diagnosis and proposed solutions. These plans are complementary, not competing. The National Development Plan makes new proposals in some areas and in others it merely outlines general points of departure to frame and guide reforms in education.

Some of the areas that need attention can be grouped into the following categories:

- The role of teachers, principals, other stakeholders, parents and districts.
- Infrastructure and information and communication technology (ICT).
- Curriculum, incentives, inclusivity and language issues.

Sports, school health, arts and culture.

The role of stakeholders in basic education

- The interests of all stakeholders should be aligned to support the common goal of achieving good educational outcomes that are responsive to community needs and economic development.
- Educational institutions should be provided

o with the capacity to implement policy. Where capacity is lacking, this should be addressed as an urgent priority.

o Teachers should be recognised for their efforts and professionalism. Teaching should be a highly valued profession.

o Attention should be given to the continuing development of teachers and promotion of professional standards. Bodies such as the South African Council for Educators and specialist subject associations need to play a greater role in this. Teachers must have a good knowledge of the subjects they teach and cognitive competence in the language in which they are required to teach. Subject knowledge particularly needs strengthening in maths and science.

o The best teachers should be retained and new ones attracted. Bursary programmes for continuing professional development can improve the quality of teaching and help to attract and retain teachers. The pay structure for teachers should encourage them to stay in the profession.

o The core business of schools is learning and teaching, and the core task of principals is to ensure their school ethos is conducive to these priorities. Principals need to provide leadership on the curriculum, as well as administration and management.

o Teaching in schools can be improved through targeted support by district offices. District offices should also ensure communication and information sharing between the education authorities and schools, and also between schools.

o Top performing schools in the public and private sectors must be recognised as national assets. They should be supported and not saddled

with unnecessary burdens. Their support should be enlisted to assist underperforming schools. To remain the beacons of our education system, they need to be supported as well as held accountable for performance based on an agreed set of outcomes.

o Providing meaningful information to parents on their children's performance can enable them to hold schools accountable. Performance tends to improve when parents are actively involved and take an interest in the affairs of the school.

School infrastructure

o Ensure that all schools meet minimum standards for infrastructure and commit to progressively upgrading each school's infrastructure to meet optimum standards.

o Target no-fee schools when planning infrastructure to compensate for resource deficits in communities. There should be well-equipped libraries, laboratories, computer and media centres to ensure that learners in no-fee schools have access to similar learning resources to their counterparts in less poor communities.

o Take learner safety into account when planning infrastructure.

o High speed broadband should be readily available and incorporated into the design of schools. This will enable greater use of technology in education and enhance the classroom experience for both teachers and students.

o Explore the use of mobile devices such as
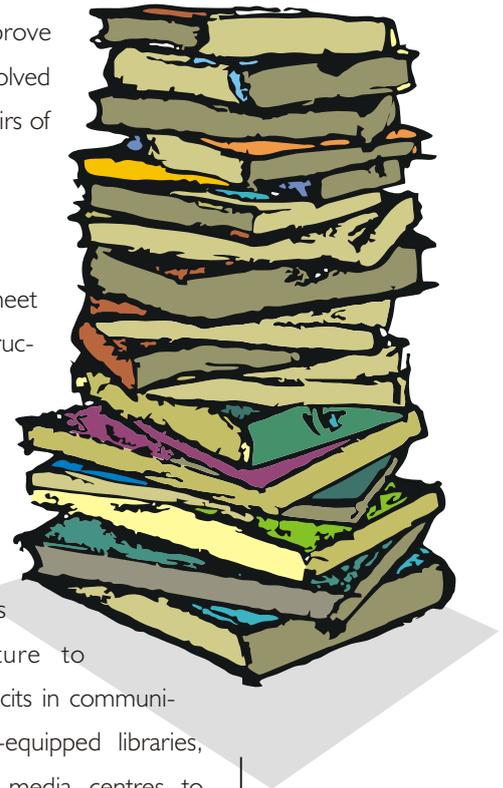
phones and tablets in distributing learning content.

Curriculum, incentives, inclusivity and language issues

O Avoid disruptive changes to the curriculum. Keeping curriculum changes to a minimum will enable teachers to develop the core skills and competence to deliver the curriculum.

O Introduce incentive schemes linked to the annual national assessments to reward schools for consistent improvements. Avoid entrenching historical inequalities by ensuring that the incentives reward schools according to the rate of performance improvements.

o Provide inclusive education that enables everyone to participate effectively in a free society. Education provides knowledge and skills that people with disabilities can use to exercise a range of other human rights, such as the right to political participation, the right to work, the right to live independently and contribute to the community, the right to participate in cultural life, and the right to raise a family. Ensuring that all children with disabilities have access to quality education will help South Africa meet its employment equity goals in the long run.
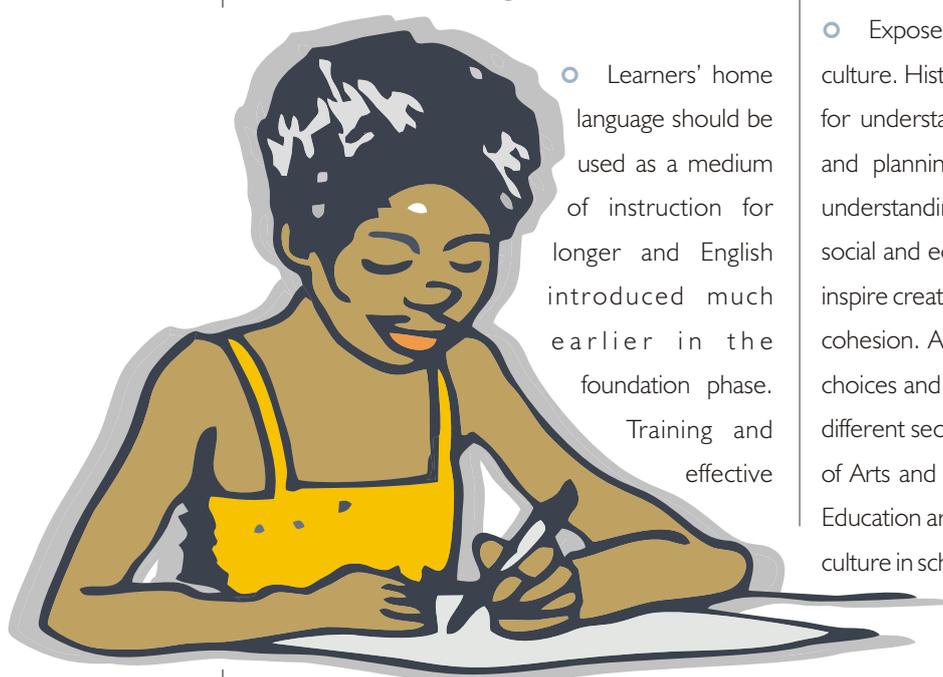
O Learners' home language should be used as a medium of instruction for longer and English introduced much earlier in the foundation phase. Training and effective support materials should be available for teachers and learners to facilitate the transition to English as the language of learning and teaching.

O Introduce career guidance at the senior phase of primary school to ensure that learners are aware of further educational opportunities and can make informed career choices. Programmes to expose learners at the earliest stages of primary school to different careers also should be supported. Career guidance helps expose learners to opportunities and should be an integral part of the school curriculum. This will help reduce the high number of learners who drop out.

Sports, arts and culture

O Encourage sports and physical education. They are an integral part of the holistic development of a learner. Schools are where talent is identified, career choices made (including careers in sport) and habits learnt. Given the growing problem of obesity, the habit of leading an active life-style can be developed at a young age through participation in sport. Working with the Department of Sport and Recreation, the Department of Basic Education has reintroduced school sport. This positive initiative needs to be expanded.

O Expose learners to history, heritage and culture. History, heritage and culture are important for understanding the past, analysing the present and planning for the future. They foster social understanding and cohesion, which is important for social and economic stability and growth. The arts inspire creativity and innovation and also build social cohesion. A holistic education widens career path choices and develops audiences and consumers in different sectors of the economy. The Department of Arts and Culture and the Department of Basic Education are developing plans to revitalise arts and culture in schools.

Long-term goals for basic education

Improving the performance of the South African education system requires hard work and focus.

The Commission proposes that specific focus over the next 18 years should be on:

- Improving literacy, numeracy/mathematics and science outcomes
- Increasing the number of learners eligible to study maths and science-based degrees at university
- Improving performance in international comparative studies
- Retaining more learners.

These goals will require improvements in other areas as well and will impact on the education system as whole.

Improve literacy, numeracy/mathematics and science outcomes

The Department of Basic Education aims to increase to 90 percent the number of learners in grades 3, 6 and 9 who have mastered the minimum competencies in language and numeracy by the end of each year. The Commission proposes that the required competency levels be defined as 50 percent and above. In other words, 90 percent of learners in grades 3, 6 and 9 must achieve 50 percent or more in the annual national assessments in these subjects.

Increase the number of students eligible to study maths and science at university

In 2011, 120 767 learners were eligible for a bachelor's programme, down from 126 371 in 2010. The Department of Basic Education's plan is to increase the number to 300 000 by 2024, with 350 000 learners passing mathematics and 320 000 learners passing physical science. The Commission proposes a target for 2030 of 450 000 learners being eligible for a bachelor's programme with

maths and science. Action is required throughout the education system, but particularly in early childhood development given that the cohort that will enter university in 2030 has not yet started primary school. Consideration should be given to expanding the Dinaledi Schools initiative, which increases access to maths and science in underprivileged schools.

Improve performance in international comparative studies

The Department of Basic Education aims to improve South Africa's average Southern and East African Consortium for Monitoring Education Quality results for grade 6 languages and maths from 495 to 600 points by 2022. And to improve average grade 8 scores in the Trends in Mathematics and Science Study (TIMSS) from 264 to 420 points by 2023. The Commission proposes that grade 8 scores in the round of TIMSS closest to 2030 should reach 500 points.

South Africa needs to develop and strengthen collaboration with other education systems in the English-speaking world and the BRIC countries (Brazil, Russia, India and China) to ensure that students from the South African education system are equipped to be admitted into those systems. International collaboration in education will help South Africa to successfully tackle its education challenges. Stronger educational links with these countries will also help students to become increasingly broadminded in terms of how they look at both South Africa and the wider world.

Retain more learners

South Africa loses half of every cohort that enters the school system by the end of the 12-year schooling period, wasting significant human potential and harming the life-chances of many young people. Secondary school completion rates are 77 percent in the United States, 87 percent (to

the age of 16) in the United Kingdom and 93 percent in Japan. South Africa should aim for a comparable completion rate of between 80–90 percent, including learners in further education and training (FET) colleges. Compulsory education should be extended to successful completion of Grade 12 in basic education or the equivalent level in the post-school sector. FET colleges should provide a meaningful vocational education alternative to secondary schooling. There needs to be alternative post-secondary education of good quality for learners who cannot, or choose not to, go to university.

Proposals to improve human capacity

Human capacity weaknesses are pronounced in teaching, management and district support structures. Over the next 18 years, the following actions will need to be given attention. Some of the actions will be short to medium-term and others will be medium to long-term.

Produce more and better qualified teachers

The number of teachers produced each year has increased noticeably, but there are still shortages of teachers for certain subjects and age-groups. Subjects with teacher shortages include languages, mathematics, science, technology and the arts. The shortages are compounded by the fact that teachers who specialise in these subjects are not always assigned to teach them. There are shortages in the foundation phase and early childhood development. Geographically, shortages are acute in township and rural schools.

One of the main reasons South Africa needs more teachers is to reduce class sizes. Class sizes impact on learner performance. Small classes allow teachers to give more attention to individual learners. In South Africa, for every teacher there are 33 learners, compared to Botswana where the

ratio is 1:22, which is one of the lowest teacher/learner ratios in the world. The Department of Basic Education estimates that to achieve the same ratio as Botswana, the public sector has to employ 160 000 more teachers.

The solution to the weaknesses in teacher capacity is not simply to train more teachers or for existing teachers to gain higher qualifications. Teachers certified as qualified increased from 54 percent in 1990 to 94 percent, but outcomes have remained poor.

○   South Africa needs to improve the quality of teacher training, and recruit higher calibre candidates. *The Integrated Strategic Planning Framework for Teacher Education and Development in South Africa 2011–2025,* provides a useful framework. It needs to be strengthened and there should be incentives to ensure it is implemented effectively.

○   In the short to medium term, recruit foreign teachers in the areas of critical shortages and grant seven-year working permits to foreign students graduating in South African universities.

○   Explore non-conventional approaches to attracting and preparing teachers, such as professionals from other areas entering teaching (second-career professionals), on the job training, and fast-track entry systems for experienced professionals.

○   Create an institutional environment that allows educators in private schools to move back to the state system.

The availability of teachers in all subjects in all schools requires:
○   Expanding training capacity
○   Investigating new ways of attracting teachers
○   Removing entry difficulties for teachers who have left the profession, foreign teachers, and

professionals from other sectors

○ Addressing policy blockages that prevent the deployment of teachers to teach where they are most needed.

Expand the Funza Lushaka bursary scheme

○ Strengthen and expand Funza Lushaka, an important new strategy to attract learners into the teaching profession. Full-cost bursaries enable eligible students to complete a full teaching qualification in an area of national priority. Recipients of these bursaries are required to teach at a public school for the same number of years that they receive the bursary.

○ Ensure that Funza Lushaka graduates are immediately absorbed into schools. Human resources planning should anticipate the number of Funza Lushaka graduates each year and deploy them to the schools where there are shortages. It should not be left to graduates to find placements in schools.

Develop teachers' skills and commitment

○ Help teachers develop better ways of delivering the curriculum using the learner workbooks that are provided, including structuring lessons, covering the material in the curriculum and conducting assessments. This should be the short-term focus and directed at in-service teachers. As teachers gain confidence and develop skills to deliver the curriculum, the focus will move to other aspects of teacher development.

○ Help teachers improve their knowledge of the subjects they teach. This is of critical importance. Teacher development should build teachers' subject knowledge and provide training in effective teaching methods. Teacher development programmes should be targeted at those areas where teachers' subject knowledge is weakest.

○ The department, schools and professional bodies should be involved in organising and delivering teacher development activities. Teachers must also take the initiative to identify the areas in which they need further development and approach the department for assistance to access

training opportunities. Courses that are in line with the requirements of the teacher's job must be fully subsidised by the government and should take place outside term time. On completion of the course or professional development activities, teachers should earn points towards meeting the continuing Professional Teacher Development requirements of the South African Council for Educators.
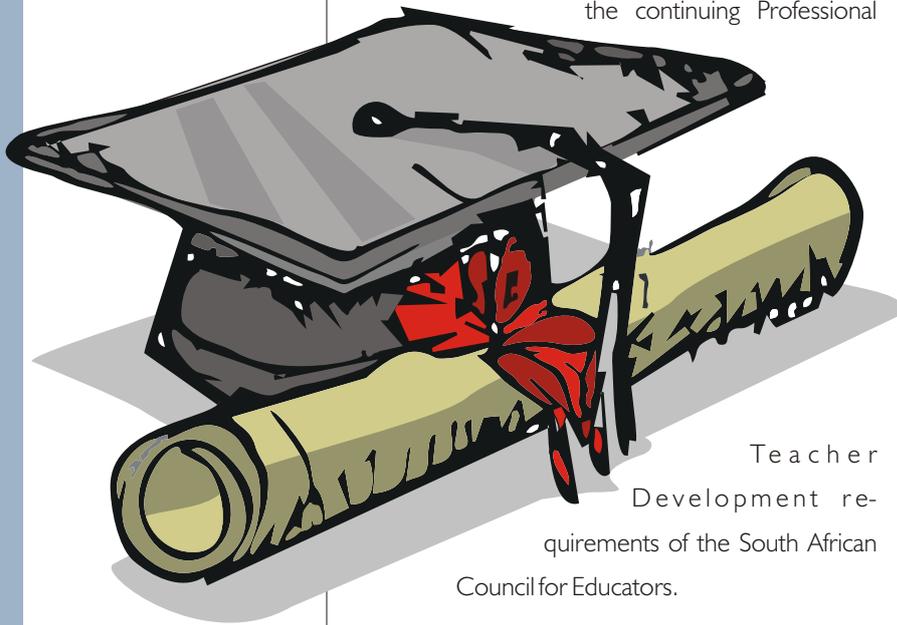
o Expose teachers to the use of technology in their own training, and train them to use it in their teaching. Greater use of technology backed by high-speed broadband could open new opportunities not currently available for learners in disadvantaged schools.

o Investigate introducing professional certification. Newly qualified teachers would need to demonstrate certain competencies before they are employed in schools, and after that they would be offered preliminary or probationary certification, to be finalised based on demonstrated competence. The professional certification of all teachers would need to be renewed periodically (for example, every five years), serving as an incentive for teachers to undertake continuous professional development.

Professional associations
o Allow a wide range of training providers to offer professional development courses for teachers, subject to approval by the South African Council for Educators.

o Support professional associations working more closely with teachers to provide professional development opportunities, disseminate information about best practices and provide updates on cutting-edge research in particular school subject areas. In subject areas where professional associations do not exist, provide incentives to stimulate their establishment.

Teacher unions
Teacher unions are crucial to improving the education system. Experience in other countries shows that without a good level of professional expertise among union leaders, it is difficult to get unions to move beyond the issue of salary increments to the core professional concern of improving the quality of education.

o Investigate ways of working with unions to reach their members.

o Sponsor advanced studies for union leaders as part of a constructive partnership.

o Assist unions in developing the capacity to implement continuous professional development strategies for their members. Over time, accredit professional development institutes linked to unions so that they can offer continuous professional development that earns points towards meeting the Continuing Professional Teacher Development requirements of the South African Council for Educators.

Remuneration
o Change the pay structure for teachers. Bursaries alone will not attract enough top-

achieving candidates into teaching. The flat wage gradient is a deterrent for highly skilled people. Teacher salaries need to be competitive in comparison to other parts of the public sector. The wage structure should recognise qualifications, experience and the scarcity of skills in specific subjects or geographic areas.

○ Link the pay structure to career paths and reward good teachers.

Improving performance

Many education experts are critical of the idea of linking teacher pay to the performance of learners because it ignores other factors affecting learner performance, such as the socioeconomic status of learners, parent involvement, learning backlogs, and school infrastructure and resources. Teachers in poor areas would be penalised for factors they have no control over, and teachers in rich schools would be more likely to benefit. The Commission therefore proposes that incentives be directed at schools rather than at individual teachers to focus on those areas where teachers working collectively can make a difference.

○ Reward schools that show continuous improvements in their annual national assessments. To target incentives at where they are most needed, design the incentives to prescribe that schools should improve their results by 10 percent or more to qualify. Many of the schools in affluent areas are already performing at high level with pass rates above 80 percent and are unlikely to improve their results by 10 percent.

○ Ensure that improvements are sustainable by prescribing that schools must show improvement over three consecutive years to qualify for rewards.

○ Maintain a careful balance between making the conditions too difficult so that it is not worthwhile for schools to work towards them, or so easy that they make no difference to performance.

Proposals for improving school management

The core business of schools is learning and teaching. The main responsibility of a school principal should be to lead the core business of the school.

Appropriately qualified and competent principals

○ Change the appointment process to ensure that competent individuals are attracted to become school principals. As in other senior management positions, candidates should undergo a competency assessment to determine their suitability and identify the areas in which they would need development and support.

○ Eliminate union influence in promoting or appointing principals. Unions play an important role in recruitment to ensure that proper procedures are followed, but not in deciding who gets promoted or appointed. Most of the undue influence by unions is possible because the district officials responsible for recruitment and human resources management have a limited understanding of labour laws. The Department of Basic Education and provincial departments of education must ensure that human resources management capacity is improved.

○ Implement an entry qualification for principals. In 2007, the Department of Education introduced an entry qualification for aspiring principals with a view to improving educational outcomes. The Advanced Certificate in Education (ACE) was

piloted nationally. The External Evaluation Research Report of the Advanced Certificate in Education did not find clear evidence of short-term gains in matric results at the schools where principals had undergone ACE training. The fact that the evaluation was done only two years after the qualification was introduced may explain its limited impact and the evaluation results should not be used to discredit and discontinue the implementation of an entry qualification for principals. The results of the evaluation must be used to improve and strengthen this programme. The qualification (or its adaptation) should continue to be offered as in-service training for incumbent principals.

Performance management

O   Introduce performance contracts for principals and deputy principals, in line with Department of Basic Education policy. Use these contracts to help principals find ways to improve their performance every year, including identifying their training needs. Over time performance contracts should also be introduced for other members of school senior management teams (SMT).

O   Replace principals who repeatedly fail to meet performance targets, based on monitoring information and interviews with school stakeholders.

O   Use data from the performance management systems to identify areas where principals need more training and possibly to update the ACE curriculum.

Powers of principals

O   Gradually give principals more administrative powers as the quality of school leadership improves, including in financial management, the procurement of textbooks and other educational material, and human resources management. These delegations ensure that principals are held accountable for their schools. Provincial departments will remain the employer of educators, and wages will continue to be centrally determined.

Proposals for improving district support

O   Create capacity in districts so that they can support schools to deliver the curriculum. Districts require skills and expertise in curriculum management, project management, data analysis, monitoring, planning, reporting, accounting and problem solving in order to provide effective support. Many of the weaknesses in schools are a reflection of weaknesses at the district level. Curriculum experts at district level should support teachers, and managers should support principals and heads of departments. Districts should also be responsible for planning for the academic year in each school, making sure that each school has all the necessary materials, and designing interventions to support underperforming schools.

O   Deploy multidisciplinary support teams to work with districts in the short to medium term.

Proposals for results oriented mutual accountability

Schools can be intimidating for many parents of learners. In poor communities in particular, there is an imbalance in power relations. Parents often feel ill equipped to engage with teachers and school management about the performance of their children and the school as a whole. The absence of accessible performance indicators and the lack of feedback from teachers makes it difficult for parents to monitor their child's progress and engage with the school.

This breakdown in the relationship between schools and parents also makes it more difficult for teachers to maintain discipline and hold learners accountable for regular, punctual attendance.

○ Construct a results-oriented framework of mutual accountability where districts are accountable for supporting schools, including the nature of the support they provide, the number of times they have visited each school and what they did during the visits. Schools also need to be accountable to education authorities for their overall performance on key indicators. More importantly, schools should be accountable to the school community for the performance of the school in relation to the annual school plan. Finally, parents should be accountable for the behaviour, attitude, attendance and work ethic of their children.

○ Provide all stakeholders with clear information on accountability measures. Accountability measures are likely to be met with resistance because they change the balance of power. At first, they will add to the workload of teachers and principals and put new obligations on parents. Once systems and routines are established, the workload will lessen and the system will deliver benefits for everyone.

○ Each school should have a plan that maps out its goals for the academic year. Performance indicators, such as the rate of improvement on annual national assessment (ANA) results, curriculum coverage and teacher and learner attendance, should be monitored and regular reports provided to parents. The ANA results should be made accessible to parents and the community in a way that makes the data easy to interpret.

Reliable measures

○ Externally administer and mark the ANA for at least one primary school grade to ensure that there is a reliable, system-wide measure of quality for all primary schools. This will serve as a snapshot of the health of the system and help authorities to develop targeted interventions.

Community ownership

○ Give additional support to governing bodies. School governing bodies have a clear legal mandate to oversee the governance of schools. This includes extensive responsibility for finances and internal school policies. Many governing bodies are significantly hampered by parents' lack of expertise and social status relative to school staff.

○ Develop a strong sense of community ownership. This encourages community members to assist with a range of tasks, such as helping to deliver the school nutrition programme, growing and supplying the school with vegetables and preparing meals, monitoring learner safety, and preventing vandalism and theft. School management will have to work with communities on an on-going basis to develop and maintain such a sense of ownership.

Proposals to improve school infrastructure

School infrastructure backlogs have been considerably reduced over the past 10 years. But many school environments are still not conducive to learning.

The Department of Basic Education has committed itself to eradicating 496 inappropriate structures, providing basic water to 1 257 schools, providing basic sanitation to 868 schools and providing electricity to 878 schools in the 2012/13 financial year. To meet these commitments, the department will have to:

- Find ways to deliver infrastructure and services more efficiently and cost-effectively
- Improve the quality of information used for planning.

Factors affecting the continued backlogs:

- Vandalism and theft of equipment
- Natural disasters such as storms, floods and fires
- Migration to urban areas puts pressure on infrastructure in those areas, while other schools are underused
- Escalating building costs even as the school infrastructure budget has increased
- Lack of capacity in planning, procurement, project management, financial management and construction management.

In addition to suitable buildings, schools need access to services such as water, sanitation and electricity. The rollout of infrastructure for these services is bedevilled by poor coordination between different state agencies and local authorities, who are responsible for providing infrastructure services.

Infrastructure shortages are particularly acute in poor communities where learners are at a significant disadvantage. The no-fee school policy and school nutrition programme are important interventions to mitigate the negative effects of poverty on learning.

In many rural areas schools are the only public institution communities have access to. No-fee schools are typically located in areas with low levels of education, fragile social networks, largely dysfunctional community structures, no community libraries, limited access to media, and few sources of information about opportunities. Schools in these communities should be strengthened and
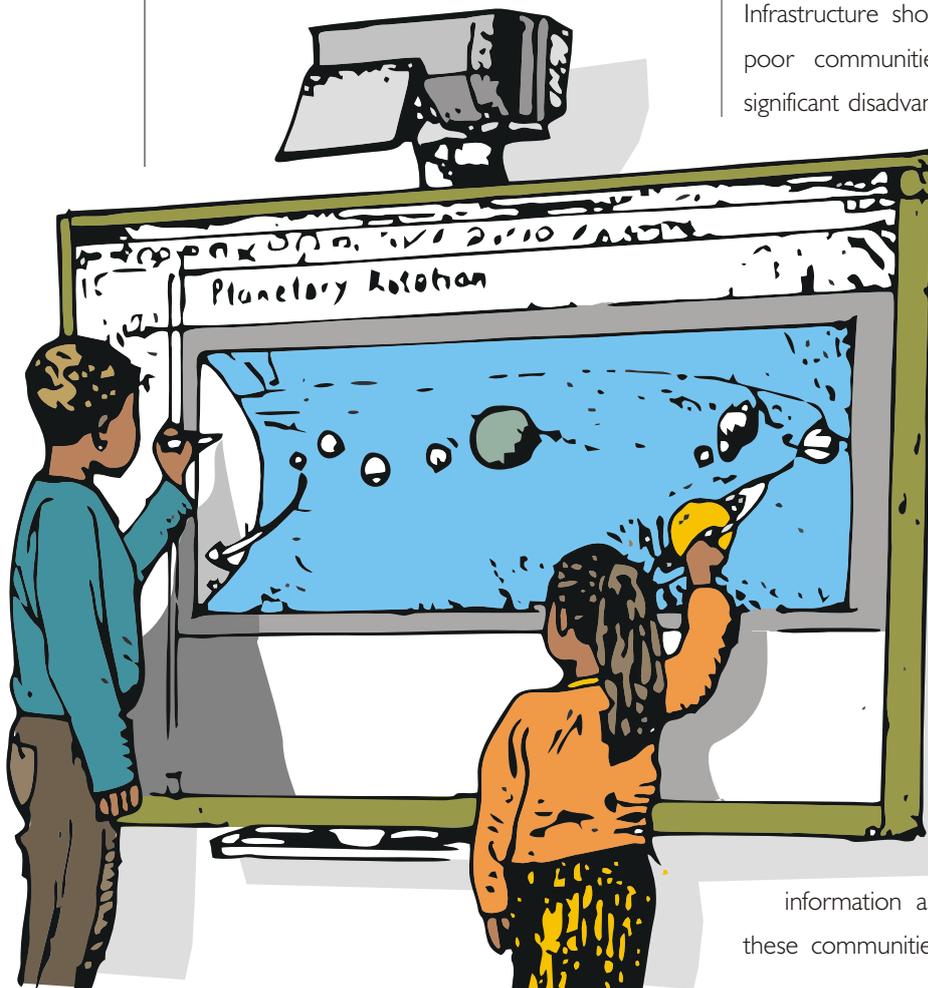
equipped with the best infrastructure, equipment and resources (especially ICT infrastructure) to strengthen their role in countering historical disadvantage. No-fee schools should be targeted for significant infrastructure upgrading.

The Department of Basic Education has guidelines for planning public school infrastructure. These guidelines classify primary and secondary schools into four categories based on the number of learners: small, medium, large and mega schools. The school environment is further graded according to basic safety, minimum functionality, optimum functionality and possibilities for enrichment. The guidelines are sound and should be legislated to ensure that they are adhered to. Legislated guidelines will help to ensure they are not deliberately ignored by officials involved in planning, constructing and improving school infrastructure.

Goals

○ Eradicate infrastructure backlogs. All schools should meet the minimum standards by 2016.

○ Undertake an infrastructure audit to enable proper planning. By 2030, all schools should have high quality infrastructure.

Actions

○ Investigate the spiralling costs of building schools. Chapter 13 sets out principles for ensuring that procurement delivers value for money

○ Develop measures to build schools at a reasonable cost without compromising quality.

○ Expand infrastructure delivery capacity.

○ To avoid construction delays clarify and streamline the responsibilities of different institutions including the Departments of Basic Education and Public Works, the Independent Development Trust, provincial departments of education, and local authorities.

○ Reverse the decision to centralise the delivery

of school infrastructure and develop capacity at the appropriate levels. Procurement decision making should remain decentralised but there's a central role in providing enabling structures (in this case guidelines on price, materials and construction firms) as well as differentiated oversight.

○ Plan new schools according to population trends and settlement patterns to avoid constructing schools where demand is declining. This will require closer coordination with local authorities.

○ The Department of Basic Education, Department of Communications, Department of Public Enterprises and INFRACO must draw up a joint plan to roll out broadband ICT infrastructure to schools. ICT will play an increasing role in education over the next 18 years, and the most crucial enabler of ICT is high-speed broadband. Corporate foundations, NGOs and international donors should be invited to work with the government to develop open source educational software and content.

The education pact

It is generally accepted that South Africa's education system needs far-reaching reforms. Many corporate foundations, NGOs, faith-based organisations, and individuals have offered their expertise as part of a national initiative to support schools to improve learning outcomes.

The Department of Basic Education's plan, the Basic Education Accord, the Quality Learning and Teaching Campaign (QLTC) and the National Development Plan all point to the need for:

○ More focused approaches

○ Intersectoral cooperation.

There are many interventions by the public sector, private corporations, universities, unions and

NGOs. The Department of Basic Education has established a delivery unit to work with schools in underperforming districts throughout the country. The current level of consensus among stakeholders and the will to work together constitute an important moment in South African society and an opportunity that we need to build on.

It is difficult to get different groups to agree to work together, even if it is in their collective interests. In divided societies like South Africa, levels of trust are low and groups tend to prioritise their immediate sectoral interests. When parties do agree, it can be difficult to keep to the terms of the agreement.

The QLTC Code for Quality Education pledge and the Basic Education Accord set out what each party should do to improve the quality of education, but implementation has been patchy. A new agreement will not lead to improvements unless we focus on the obstacles to implementing existing agreements.

The public signing of an agreement represents an important symbolic commitment by leadership and a public statement of what is important. This should not be a once-off event. Leaders must engage with each other on a continuous basis and repeatedly reaffirm their commitment to the pact.

○ Build consensus on the education pact. The pact must be meaningful to all education stakeholders and to all South Africans.

○ Monitor the pact at the school level. Provide the school community with regular information so that local solutions can be found.

The Commission is proposing a painstaking process of mobilisation and continued engagement with the education pact. All political leaders, inside and outside of parliament, in provincial legislatures and councils, should commit to the education pact and use it when they do their constituency work. Leaders of sports and faith-based organisations, unions, NGOs, corporations, cooperatives, student organisations, governing bodies, traditional leaders and traditional healers should discuss the pact and address obstacles to implementation.

The importance of education to the future of South Africa demands a non-partisan approach. South Africans should agree that differences and grievances should never be allowed to disrupt education.

A national initiative to improve learning outcomes

Drawing on the existing consensus on the need to work together, the Commission proposes a national initiative involving all stakeholders to drive efforts to improve learning outcomes in schools, starting with the worst performers. The focus should be on schools and districts and address weaknesses in teaching, management, administrative support and accountability.

As a short to medium-term intervention, it should:
○ Use strategies that compensate for weaknesses in schools and district
○ Provide intervention tools that do not require high levels of capacity
○ Help build capacity.

Each of the broad elements of the initiative will have detailed plans and realistic implementation strategies.

○ Ensure that districts have the capacity to support curriculum delivery. Each district should have a team that ensures that each school has the required material and the knowledge and skills to use it. Districts should
○ help to develop the leadership and

management capacity of principals and heads of departments. At a minimum, this development should cover training in the key responsibilities of principals and members of school senior management teams.

o Teacher development should include training on curriculum pacing and the subject content that teachers find difficult to teach. Given the large numbers of teachers, ICT should be used as one of the ways of delivering teacher development.

o Different stakeholders should collaborate under a single national initiative to pool resources. Many international donors, private companies, corporate foundations, charitable organisations, NGOs, faith-based organisations and individuals have initiatives under way or are willing to be part of a national initiative. The national initiative should provide a framework that gives direction to these individual efforts.

o Work with communities to address socioeconomic factors like nutrition and safety that impact on learning.

The national initiative should be under the auspices of the Department of Basic Education, but draw on expertise in institutions that are already working on school improvement as well as those that have the potential to make a contribution.

The initiative should be piloted in a sample of schools and expanded over time. Interventions should be inversely proportional to school performance. Schools performing well will not be expected to do tasks designed for poorly performing schools. And schools with the lowest performance will receive the closest attention.

POST-SCHOOL

The post-school system comprises a wide range of institutions with different objectives and meeting different needs. These institutions can be developed to accommodate more learners. Institutions should collaborate to build on each others' strengths.

The current post-school system comprises:

o Further education and training colleges, which focus mainly on vocational education and training

o Private providers at colleges and universities

o Adult education institutions

o Universities

o Sectoral education and training authorities, generally called the skills development sector

o The regulatory and quality assurance framework.

The goal is to have a post-school system that provides quality-learning opportunities to young people, adults who want to change careers or upgrade skills, people who have left school before completing their secondary education and unemployed people who wish to start a career. Post-school institutions should provide programmes and services that meet the range of needs.

Vision for the post-school system

The Commission is in agreement with the vision for South Africa's post-school system set out in the Green Paper for Post-School Education and Training (DHET, 2012). The Green Paper promotes higher education as an expanded, effective, coherent and integrated system. Higher education institutions should be supported by effective regulatory and advisory institutions.

The Commission would add to DHET's vision the need to build national institutions for science, technology and innovation to develop intellectual

capital and spur economic growth and development. This system needs to be supported by effective governance and funding mechanisms to promote coordination and collaboration.

South Africa needs a post-school system that provides a range of accessible options for younger and older people. The system should be capable of adapting to changes in technology, industry, population dynamics and global trends. Accelerating economic growth requires science, technology, vocational and technical skills, and they need to be produced quickly. To promote lifelong learning, post-school institutions should accept students who are academically less prepared and provide them with targeted support.

Role of the post-school sector

○ Contribute towards quality learning and teaching in the entire education system from pre-school through to higher education. Teachers in schools, ECD centres and colleges are trained in universities.

○ Respond to the skills needs of all sectors of society including business, industry and the government.

○ Raise education and training levels to produce highly skilled professionals and technicians.

○ Provide lifelong learning opportunities for a wide range of candidates.

○ Develop partnerships to play a strong role in national and regional initiatives.

○ Conduct and disseminate research.

○ Promote technology transfer through research studies done in collaboration with local and foreign firms.

○ Enhance research, development and technology infrastructure.

○ Strengthen the foundations for good governance by enabling citizens to participate meaningfully in the social, economic and political life of the country.

Overview of the current post-school system

The South African post-school system is not well designed to meet the skills development needs of either the youth or the economy. Approximately three times as many students enter universities each year compared to those entering colleges. In 2010, universities enrolled around 950 000 students while colleges enrolled about 300 000. Public adult learning centres enrol approximately 300 000 learners who are studying part-time for Grade 12 and adult basic education training learners. Private providers are playing an increasingly important role in the post-school sector. Enrolments in private higher education institutions are estimated to range from 80 000 to 120 000 learners. A large number of private providers offer FET courses funded through the skills levy.

Though some institutions perform well and have the academic expertise and infrastructure to be internationally competitive, many lack adequate capacity, are under-resourced and inefficient. Access and opportunities are inequitably distributed. The growth of enrolments in private institutions also indicates that the public system is not responsive to the needs of all students.

Universities

In 2030, South Africa will have over 10 million university graduates with a minimum of a bachelor's degree. This takes into account the current number of graduates and the targets proposed in this plan. This will be a 300 percent increase over a 30-year period (2001 – 2030). There will be roughly

400 000 new university graduates each year. In 2001, South Africa had 2.6 million graduates (Statistics South Africa) or one in every 17 people. In 2030 one in six people will be a university graduate. This is one of the strongest indicators of expanding access to university education.

For the increase in the number of graduates to be meaningful, the quality of education needs to improve. Many of the new graduates between now and 2030 must be in the critical skills categories, such as engineering, actuarial science, medicine, financial management, and chartered accountancy. The downward trend in the number of learners who pass matric with mathematics must be reversed.

The data on the quality of university education is disturbing. South African universities are mid-level performers in terms of knowledge production, with low participation, high attrition rates and insufficient capacity to produce the required levels of skills. They are still characterised by historical inequities and distortions. The university sector is under considerable strain. Enrolments have almost doubled in 18 years yet the funding has not kept up, resulting in slow growth in the number of university lecturers, inadequate student accommodation, creaking university infrastructure and equipment shortages. The number of institutions that have recently been put under administration is an indication of the leadership and governance challenges.

The need to improve quality is demonstrated by the reports of graduates who are unable to find employment and the low conversion rate from graduation to achieving professional status in engineering science. The Engineering Council of South Africa reports that only 10 percent of graduates who had been registered as candidate engineers for more than three years attained registration as professional engineers in the last two years. The legal profession is facing similar challenges.

The academic profession requires renewal if South African universities are to expand, compete and drive the knowledge society and economy. There is a shortage of academics, especially in the human, natural, engineering and actuarial sciences. The problem of graduate unemployment in the face of skills shortages is an indication that universities produce graduates who do not meet the needs of industry and society.

Higher education is the major driver of information and knowledge systems that contribute to economic development. However, higher education is also important for good citizenship and for enriching and diversifying people's lives. Quality higher education needs excellence in science and

technology, just as quality science and technology needs excellent higher education. The most important factor that determines quality is the qualifications of staff.

Universities are key to developing a nation. They play three main functions in society:

○ Firstly, they educate and train people with high-level skills for the employment needs of the public and private sectors.

○ Secondly, universities are the dominant producers of new knowledge, and they critique information and find new local and global applications for existing knowledge. South Africa needs knowledge that equips people for a changing society and economy.

○ Thirdly, given the country's apartheid history, higher education provides opportunities for social mobility. It can strengthen equity, social justice and democracy. In today's knowledge society, higher education is increasingly important for opening up people's opportunities.

To increase the output of professionals, all parts of the education system have to perform well. This is why the Commission has identified improving the quality of education outcomes throughout the education system as one of the highest priorities.

Differentiation

South Africa has a differentiated system of university education, but the system does not have enough capacity to meet the needs of learners. Universities of technology and comprehensive universities have more than half their students enrolled on vocational programmes, while traditional universities have an almost equal spread of enrolments between vocational, professional and general qualifications. Traditional universities have a higher percentage (14 percent) of enrolments at masters and PhD level compared to the other two (2 percent and 3 percent respectively). Indicators such as doctoral degree output, research output and the proportion of staff with PhDs also show that research capacity is concentrated in a few institutions.

A detailed analysis of the nature and extent of differentiation in the university sector has been done. Such analysis enables policymakers to make sober decisions about funding, support and performance targets for the different kinds of institutions.

Universities must:

○ Define their niches to enhance their ability to contribute to national objectives

○ Provide a diversity of programme offerings to learners

○ Develop capacity to provide quality undergraduate teaching

○ Some must develop the capacity for cutting-edge research training

○ Provide for flexibility and innovation throughout the system.

Building an expanded, differentiated university system requires that other post-school institutions function optimally. If the college sector functions

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optimally, the pressure on universities to offer lower level diplomas and certificates will be reduced. This will allow universities to focus on their niche.

Proposals for universities

○ Improve the qualifications of higher education academic staff. South Africa needs to increase the percentage of PhD qualified staff in the higher education sector from the current 34 percent to over 75 percent by 2030. Higher Education South Africa (HESA) has developed a detailed proposal for a National Programme to develop the Next Generation of Academics for South African Higher Education. The proposal seeks to address the challenge of developing future academics and deserves to be implemented.

○ Improve the quality of teaching and learning. University lecturers should be recognised teachers.

○ Increase the participation rate at universities by at least 70 percent by 2030 so that enrolments increase to about 1.62 million from 950 000 in 2010.

○ Increase the throughput rate for degree programmes to more than 75 percent. The number of graduates will increase from the combined total of 167 469 for private and public higher education institutions to 425 000 by 2030. As part of this target, the number of science, technology, engineering and mathematics graduates should increase significantly.

○ Increase the number of masters and PhD students, including by supporting partnerships for research. By 2030 over 25 percent of university enrolments should be at postgraduate level. International exchange partnerships should be pursued and encouraged.

○ Produce more than 100 doctoral graduates per million per year by 2030. South Africa currently produces 28 doctoral graduates per million per year, which is very low by international standards. To achieve the target of 100 per million per year, South Africa needs more than 5 000 doctoral graduates per year against the figure of 1 420 in 2010. If South Africa is to be a leading innovator, most of these doctorates should be in science, engineering, technology and mathematics.

○ Double the number of graduate and postgraduate scientists and increase the number of African and women postgraduates, especially PhDs, to improve research and innovation capacity and make university staff more representative.

○ Create a learning and research environment that is welcoming to all.

○ Expand university infrastructure. University enrolments have almost doubled since 1994 and infrastructure has not kept up. This has a major impact on the quality of teaching and learning. Student accommodation in universities needs urgent attention.

○ Develop uniform standards for infrastructure and equipment to support learning, promote equity and ensure that learners doing similar programmes in different institutions receive a comparable education.

○ Strengthen universities that have an embedded culture of research and development. They should be assisted to access private sector research grants (third stream funding) in addition to state subsidies and student fees, attract researchers, form partnerships with industry and be equipped with the latest technologies. In turn, they should support postgraduate students, not only in their own institutions but also in those which focus on teaching and learning as well as in other sectors of the post-school system.

○   Provide performance-based grants to build capacity and develop centres or networks of excellence within and across institutions. Given that performance-based grants, can entrench historical privilege and disadvantage, capacity-building grants should be provided with clear targets for improvement in five-year intervals.

○   Offer extra support to underprepared learners to help them cope with the demands of higher education. Many individuals with poor schooling aspire to higher qualifications, but they are academically less prepared than their middle class counterparts. Support programmes should be offered and funded at all institutions.

○   Expand the use of distance education. The advances in ICT can help overcome the infrastructure limits to further expansion of higher education. Upfront investment is needed in technology, curriculum design, quality assurance and monitoring. The Department of Higher Education and Training has published a draft policy statement intended to provide a framework for expanding the use of distance education in higher education. The Commission supports this initiative.

○   Private providers will continue to be important partners in the delivery of education and training at all levels. Ensuring the quality of private provision requires enabling regulation, quality assurance, and monitoring and evaluation of programmes.

Colleges

Approximately 65 percent of college students are unable to find work experience, which is a requirement for completing National Technical Diplomas popularly known as N diplomas. The college sector is intended as a pathway for those who do not follow an academic path, but it suffers from a poor reputation due to the low rate of employment of college graduates.

The college sector needs to be expanded, but this must be preceded by clarity about its vision and role. The priority is to strengthen colleges, address quality teaching and learning, and improve performance. A critical indicator of performance is the throughput rate and the ability of college programmes to provide the skills South Africa needs.

Colleges are the backbone of technical vocational education and training. Their target group includes young people in the FET phase who chose the vocational pathway, adults who want to change careers or upgrade skills, and unemployed people who wish to start a career. Colleges should be strengthened to become institutions of choice for the training of artisans and producing other mid-level skills.

○   Improve the throughput rate to 75 percent by 2030. This would have a major impact on South Africa's skills profile.

○   Produce 30 000 artisans per year by 2030

○   Promote lifelong learning to complement post-school education.

○   Provide funding certainty to ensure that colleges employ staff and give them job security. This will ensure that colleges attract and retain skilled and experienced college staff.

○   Support the development of specialised programmes in universities focusing on training college lecturers. Provide funding for universities to conduct research on the vocational education sector.

○   Build the capacity of FET institutions to become the preferred institutions for vocational education and training. Learners should be able to choose the vocational pathway before completing Grade 12. Expand the geographical spread of FET institutions to ensure that learners who choose to pursue a

vocational career have access to institutions that provide quality vocational education and training. Distance education with structured learner support will help to improve access.

○ Expand the college system with a focus on improving quality. Better quality will build confidence in the college sector and attract more learners. The recommended participation rate of 25 percent would accommodate about 1.25 million enrolments compared to the current 300 000. The DHET proposes establishing Community Education and Training Centres which will incorporate the current public adult learning centres. These institutions, combined with enrolment in workplace-based programmes, should reach an additional 1 million learners.

○ Build a strong relationship between the college sector and industry. This will improve the quality of training in colleges and ensure quick absorption of college graduates into jobs. Continuing education is necessary for meaningful participation in a modern economy where many jobs require some college or university education. Industry should play a significant role in college curriculum development and provide opportunities for practical training. Through this partnership, the college sector will also be able to determine what skills are needed in the labour market.

○ Significantly decrease the number of young people who are not employed or in education and training by 2030. There are currently about 3 million young people aged 18-24 who are not in employment, education or training.

The Strategic Plan 2010/11¬¬-2014/15 of the DHET identifies a number of priority areas, including: strengthening the institutional capacity of vocational education and training institutions, increasing access and improving success in programmes leading to intermediate and high learning, and ensuring a dynamic interface between workplaces and learning institutions. The commission supports these priorities.

Providers

The state and private sector both have a role to play in providing post-school education and training.

○ Develop and support a coordinated system for providing a diverse range of further education and training opportunities, through a range of state and private providers. The starting point must be strengthening existing institutions, with a focus on the college sector, public adult learning centres and technical high schools.

○ Undertake a careful analysis of all further education and training colleges, other colleges and public adult learning centres to determine gaps in the post-school institutional network. Not all

institutions can or should offer all types of training. A differentiated system is needed. Where there are gaps, new institutional types should be established.

O Identify an appropriate role for distance education in the college sector and develop a policy framework to guide institutions in developing distance education.

Adult education

The adult education sector in South Africa faces many problems:

- O Limited curriculum and lack of appropriate formal qualifications
- O Small scale with around 300 000 participants
- O Lack of a clear institutional identity
- O High staff turnover due to lack of job security
- O Limited resources
- O Run on a part time basis
- O Not linked to the other parts of the education system
- O Few participants acquire the General Education Certificate.

The adult education sector is underdeveloped. It operates on a limited budget – consistently below the international benchmark of 1 percent of the education budget and has no facilities of its own - it shares facilities with schools. The level of qualifications of teachers in this sector has improved as a result of the introduction of an adult education teacher qualification via distance education by UNISA. Despite this, there is a high turnover of staff as teachers in this sector are employed on 1 year contracts. Quality is poor, regulation and monitoring is non-existent.

The Department of Higher Education and Training proposes establishing Community Education and Training Centres which incorporate and transform the current public adult learning centres. The Commission welcomes this proposal. Community Education and Training Centres will contribute to creating alternative education and training pathways. The current public adult learning centres should be transformed into Community Education and Training Centres that offer a variety of courses ranging from adult basic education to secondary and non-formal education. Community Education and Training Centres, like all post-school institutions, must have a clear identity and purpose.

The *Kha Ri Gude* Mass Literacy Campaign run by the Department of Basic Education caters for adult literacy learners and has been very successful. There is a need for relevant programmes and qualification for adults many of whom are Kha Ri Gude graduates. The existing programmes and qualifications for adult learners should be restructured to ensure they are appropriate for their target audience. The proposed Community Education and Training Centres will help expand
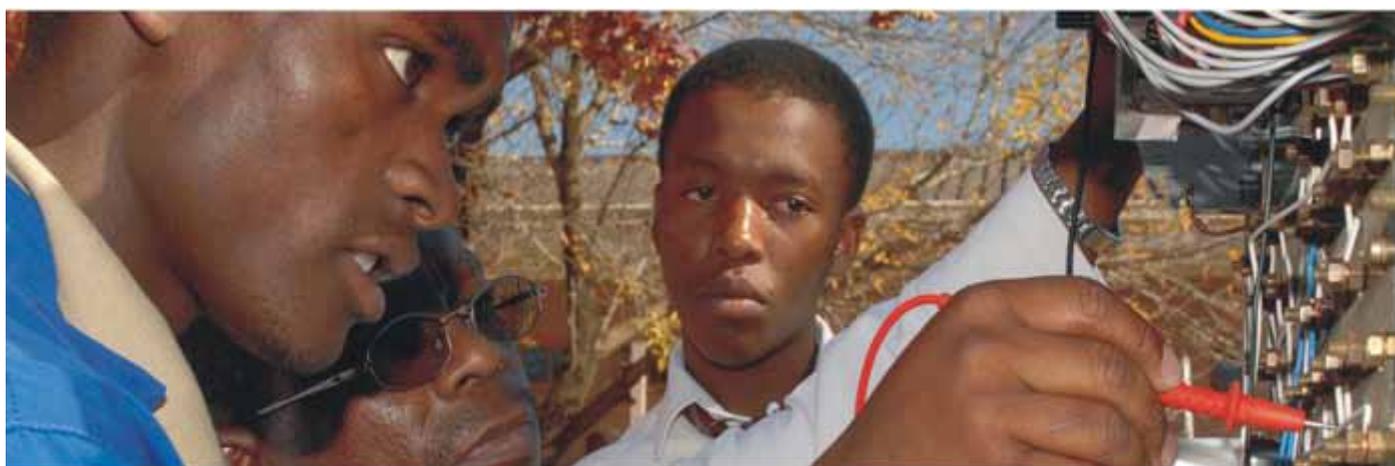
opportunities for graduates of the adult literacy campaign as well as other adult learners.

The location of the literacy campaign and the adult basic education and training programme in different departments is not ideal. Linkages need to be developed to ensure that learners who graduate from one programme do not face barriers in advancing their studies in another programme.

Skills development

The sectoral education and training authorities (SETAs) were established in 1997 and funded through the levy-grant system. They are expected to facilitate the delivery of sector-specific skills interventions that help achieve the goals of the National Skills Development Strategy and develop the skills needed by employers. There are currently 21 SETAs.

Current problems with the SETAs include:

- Poor governance
- Inadequate human resources
- Poor administration and financial management
- No proper monitoring and evaluation system
- No accurate records of the number people who have benefited from the system and what the impact has been
- Limited or no linkages with the post-school sector

Contributions of the SETA system include:

- SETAs have facilitated the participation of private training providers in skills development. However, training has tended to be in the form of short courses and in many respects has not been tailored to the needs of the labour market.
- Learnerships have facilitated entry to the labour market for unemployed people.

Where there is efficient implementation SETAs

have had a positive impact, but skills shortages continue to choke the South African economy.

Proposals for the skills development sector

- Improve relationships between education institutions and employers. SETAs have a crucial role in building relationships between education institutions and the employers.

- Resolve the role of the skills development levy. The SETAs have a surplus of about R3 billion while other bodies, such as colleges and universities, are financially constrained.

- Clarify the mission, purpose and mode of operation of the SETAs. The current system largely excludes public providers (further education and training colleges and universities) from providing training funded by SETAs and the National Skills Fund. A related issue is whether SETA funds can be used to fund new and potential employees or whether they are solely for the currently employed in levy-paying firms. The focus on existing employees makes it harder to build a strong relationship between SETAs and colleges and universities, which would be best placed to train potential employees.

- Social partners at the National Economic and Labour Development Council (NEDLAC) need to debate whether the government, as a large employer, should contribute to the skills levy. Private sector firms and SETAs should take national priorities into account when planning and funding training initiatives.

Regulation and quality assurance

Post-school education in South Africa is governed by an array of legislation and institutions. There is duplication, overlap and, at times, incoherence and inconsistency.

The quality assurance framework is complex, with

overlapping directives and on-going contestation between different quality assurance bodies. The main bodies responsible for quality assurance are the three quality councils: the Council on Higher Education (CHE), Umalusi, and the Quality Council for Trades and Occupations (QCTO). Previously, SETAs performed quality assurance functions largely directed at the private training providers they fund. Professional bodies, such as the Engineering Council of South Africa, are a fourth category of quality assurance body.

The complexity and overlaps in the regulation and quality assurance systems need to be addressed.

Structural and systemic issues

Mobility within the education system should be supported through clear standards and procedures. Students should be able to move between colleges and universities, between different universities, between schools and post-school institutions, and between educational provision and the world of work. To do this, they need information on what different institutions offer.

Each post-school institution must have a clear identity and mission, including further education and training colleges. FET colleges continue to offer traditional theoretical training for apprenticeships through the old formal technical college instructional programmes popularly known as Nated programmes and the National Certificate Vocational. Delivering these programmes in a single institution is difficult and can be confusing.

There should be programmes to upgrade the skills of college lecturers, in partnership with industry. Industry experts should be encouraged and incentivised to spend time teaching in colleges, and college lecturers should be encouraged to spend time in the workplace updating their knowledge and skills. College teaching should be made attractive to good lecturers and students.

The evolution of the post-school system should always be guided by the principle of providing learning opportunities for all students.

Drivers of change

Private and public institutions must work together to create the educational infrastructure needed to support a thriving economy. The globalisation of labour and technology markets requires education systems to collaborate across national borders and across sectors.

Demographic changes are placing increasing demands on governments and educational

institutions to increase access to affordable, high quality education.

Meeting national development objectives and responding to global trends requires changes in planning and greater use of technology in delivering training programmes.

Funding an enabling, high quality differentiated system

Funding for higher education as a proportion of GDP has declined marginally over the last few years from 0.76 percent in 2000 to 0.69 percent in 2009. To preserve the quality of higher education, additional funding will be needed to support an increase in participation and knowledge production.

Proposals for post-school funding

○ Base the revisions to the universities' funding framework that is currently being considered by the Ministerial Committee for the Review of the Funding of Universities on the needs of a differentiated system, with adequate provision for both teaching and research.

○ As the quality assurance and monitoring system matures, greater emphasis should be placed on incentivising graduate output. Such a shift would be in line with the international trend towards greater emphasis on output-based funding. The Department of Higher Education and Training would have to address the risk of discouraging universities from taking students from deprived backgrounds.

○ Provide all students who qualify for the National Student Financial Aid Scheme with access to full funding through loans and bursaries to cover the costs of tuition, books, accommodation and other living expenses. Students who do not qualify should have access to bank loans, backed by state sureties.

Both the National Student Financial Aid Scheme and bank loans should be recovered through arrangements with the South African Revenue Service. Service-linked scholarships should be available in areas such as nursing, teaching and social work.

○ Consider extending the National Student Financial Aid Scheme to qualifying students in registered private colleges as an incentive for private sector expansion.

Supporting institutions in chronic distress

The Department of Higher Education and Training should identify institutions that are in on-going crisis despite earlier interventions. Dedicated support should be provided for comprehensive renewal plans over five years. The plans should identify a viable and sustainable academic path for the institution, with an appropriate programme and qualification mix. If measurable progress towards achieving the objectives is not evident after five years, consideration should be given to reviewing the status of the institution.

NATIONAL RESEARCH AND INNOVATION SYSTEM

In comparison to its population, South Africa's science and innovation system is small by international standards. The natural sciences produce the most accredited research (36 percent of the country's total research output), followed by the humanities (21 percent) and medical and health sciences (20 percent). From 1995 to 2007, the proportion of all scientific output produced by universities increased from 80 percent to 86 percent, which means that universities are increasing their dominance as knowledge institutions in South Africa.

Research and development spending was 0.92 percent of GDP in 2007. By comparison,

Norway spends 1.62 percent. While South Africa has excelled in some areas, such as registering plant cultivars, there has been little increase in public sector research personnel, PhD graduates and research outputs. This compromises South Africa's global competitiveness.

Overall, South Africa's global competitiveness needs to be improved, and the system of innovation has a key role to play. It is the principal tool for creating new knowledge, applying knowledge in production processes, and disseminating knowledge through teaching and research collaboration.

The nature of how and where research gets done has changed radically. There are multiple sites of research and knowledge production, which are partly or wholly separated from higher education: in industrial laboratories, government departments, corporate research units, parastatals, statutory research councils and NGOs, or through collaboration between these organisations. It is essential that all these sites of research and innovation are coordinated and function coherently to take advantage of new modes of knowledge production, economies of scale and opportunities presented by working across disciplines.

The distribution of research capacity in higher education institutions is skewed in favour of historically white institutions. Under apartheid, the development of research capacity in black universities was severely limited, and they have only recently integrated research into their core functions. A research mandate has only recently been included in the institutional missions of universities of technology.

Continued advances in technological innovation and the production of new knowledge are critical to growth and development. Achieving a competitive and sustainable economy will require a strong and effective system of innovation, science and technology. The research and innovation system also needs to contribute to transformation.

The Department of Science and Technology (DST) has a number of programmes aimed at stimulating research and innovation. They cover areas such as:

- Space science and technology
- Hydrogen and energy
- Biotechnology and health innovation
- Innovation planning and instruments
- Radio astronomy advances.

The DST also aims to develop and implement national programmes to produce knowledge and the associated infrastructure, equipment and public research services to sustain the National System of Innovation. The creation of the South African Research Chairs of the National Research Foundation is an important contribution to developing research capacity.

The DST hosts science expos annually to stimulate interest in science among young people. This is an important initiative and should be supported by development of special schools for children who exhibit interest in science.

Recently, South Africa won the right to co-host the Square Kilometre Array (SKA), the largest telescope. This gives South Africa the potential to develop its capability in astronomy. There are many other programmes and initiatives that make up a base on which South Africa can build a strong National System of Innovation.

Proposals for the national research and innovation system

- Create a common overarching framework to address pressing challenges in the national system of innovation, involving the higher and further

education system, state-owned enterprises and private industries. The system needs to function in a coherent and coordinated manner with broad common objectives aligned to national priorities. Special consideration should also be given to dedicated programmes in water, power, marine, space and software engineering, in which South Africa has both comparative and competitive advantages. Companies that focus on such programmes should provide internship programmes for experiential learning, specifically in manufacturing and services.

○ Nurture and coordinate research capacity in higher education and link it to postgraduate studies. Improve coordination and support for partnerships between universities and other research and innovation sites.

○ Transform the demographic composition of researchers in higher education, research councils and private research establishments. Put in place funding and research capacity development programmes to support young, female and black researchers.

○ Increase support for postgraduate study at universities, for senior researchers, for partnerships between universities and industry. A more stable funding model is needed for all educational institutions that conduct research. Expand research capacity and improve research output.

○ Develop a common policy framework on the critical role of science and technology, the role of higher education in shaping society, and the future of the country and its growth path. This should involve the Departments of Higher Education and Training, Science and Technology, Trade and Industry, Public Enterprises, Economic Development, and the National Treasury.

○ Relax immigration requirements for highly skilled science and mathematics teachers, technicians and researchers. All graduates from foreign countries should be granted 7-year work permits. The movement of people, ideas and goods should be encouraged across the East and Southern African region.

○ Revitalise science and mathematics by increasing the number of school leavers eligible to study science and mathematics-based subjects at university.

○ Develop a few world-class centres and programmes within both the national system of innovation and the higher education sector over the next 18 years. The right to co-host the Square Kilometre Array project is an example. These should be in South Africa's areas of comparative and competitive advantage, including indigenous knowledge systems. Establish South Africa as a hub for higher education and training in the region, capable of attracting a significant share of the international student population.

○ The government must create an investment climate that encourages the private sector to compete locally and internationally with innovative products, services and technologies. The freedom of scientists to investigate and of entrepreneurs to innovate is critical. The government must support collaboration between the business, academic and public sectors.

Networks and partnerships

The national system of innovation is about networks and partnerships. Research and development happens in many sites outside universities, including the science councils, state-owned enterprises and industry.

Partnerships are important for drawing together the

capabilities, interests, and resources of different stakeholders. A framework to coordinate the production of knowledge and guide the investment of public funds should support such partnerships.

The framework should include strategies and incentives to attract businesses to develop industry clusters designed to increase competitiveness and wealth. These clusters contribute to the development of science and technology capacity.

CONCLUSION

The decisions we make today will determine the labour market prospects of graduates in 2030. We estimate that South Africa will have more than 10 million university graduates and there will be roughly 400 000 new graduates each year. Although this will represent a 300 percent increase over a 30-year period, the country needs other skills, which are provided through non-degree programmes. Our education and training institutions must deliver programmes of the highest quality.

The proposed interventions in early childhood development, basic and post school education are designed to ensure that learning outcomes improve. The challenges we face require everyone to be an active participant.