DRAFT E-EDUCATION WHITE PAPER: CALL FOR WRITTEN SUBMISSIONS FROM STAKEHOLDER BODIES AND MEMBERS OF THE PUBLIC

1. INTRODUCTION

The Department of Education invites stakeholder bodies and members of the public with an interest in Information and Communication Technologies in Education and Training to comment on the attached draft e-Education White Paper.

2. SUBMISSIONS

It would greatly assist the Department of Education if all submissions could be prepared under the following headings. If you do not wish to comment under a particular heading, indicate "No comment".

2.1 Introduction

(a) Introduction
(b) e-Education
(c) e-Education policy goal
(d) The use of ICTs in Education

2.2 The policy framework

(a) Elements of the policy framework
(b) Strategic objectives
    i. ICT professional development for management, teaching and learning
    ii. Electronic content resource development and distribution
    iii. Access to ICT infrastructure
    iv. Connectivity
    v. Community engagement
    vi. Research and development

2.3 Funding and resourcing

2.4 Implementation strategies

2.5 Other issues

Are there other issues, real or perceived, that should be addressed?

2.6 Summary of recommendations

Please list any recommendations you would like the Department of Education to consider.

(a) The Structure and Content of the draft White Paper

(b) The policy framework and strategic objectives

(c) Funding and resourcing

(d) Implications for Implementation

3. ADDRESS FOR COPIES OF THE DOCUMENT

Copies of this document are obtainable upon request from:

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4. CLOSING DATE

The closing date for the receipt of comments is Friday 31 October 2003.

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Department of Education

Draft White Paper on e-Education

Transforming Learning and Teaching through Information and Communication Technologies

September 2003

Draft White Paper on e-Education

Transforming Learning and Teaching through Information and Communication Technologies (ICTs)

Department of Education

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Design, layout and printing done by Formeset Printers, Cape

Acronyms

CD-ROM	Compact Disc - Read-only Memory
CT	Communication Technology
e-START	e-School Technology Assessment Readiness and Targets
FET	Further Education and Training
GET	General Education and Training
ICTs	Information and Communication Technologies
ISAD	Information Society and Development
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IT	Information Technology
ITAC	Information Technology Acquisition Centre
LAN	Local Area Network
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental Organisation
PIAC	Presidential International Advisory Council
NQF	National Qualifications Framework
PNC	Presidential National Commission
POP	Point of Presence
SETA	Sector Education and Training Authority
SITA	State Information Technology Agency
SMMEs	Small, Medium and Micro Enterprises
SPPP	SITA Procurement Policy and Procedures [document]
WAN	Wide Area Network

Foreword by the Minister of Education

Information and communication technologies (ICTs) are central to the changes taking place throughout the world. Digital media has revolutionised the information society and advances in ICTs have dramatically changed the learning and teaching process. This has opened up new learning opportunities and provided access to educational resources well beyond those traditionally available.

The provision of a telecommunication infrastructure available for learning and teaching is gradually increasing, and many schools are exploiting the benefits of ICTs to enhance the quality of teaching and learning.

The introduction of ICTs to our schools is creating new ways for students and teachers to engage in information selection, gathering, sorting and analysis. In addition, ICTs have the potential to enhance the management and administrative capacity of schools.

This White Paper sets out Government's response to a new information and communication technology environment in education.

We want to ensure that every school has access to a wide choice of diverse, high-quality communication services which will benefit all learners and local communities. The services provided by the initiative will enhance lifelong learning and provide unlimited opportunities for personal growth and development to all.

The challenge of providing modern technologies to schools in order to enhance the quality of learning and teaching will require a significant investment. Given the magnitude of the task ahead, and in the true spirit of *Tirisano*, the public and private sectors will have to join hands to ensure that our children receive high-quality learning and teaching. This White Paper represents a new framework for the collaboration of Government and the private sector in the provision of ICTs in education. Through this initiative, we hope that we will be able to turn our schools into centres of quality learning and teaching for the twenty-first century.

We hope this White Paper will enable the education sector and all our partners to ensure optimal availability and use of ICTs in education, in a manner that will create better access to quality education for all, and bridge the digital divide, both within our country, and between our country and other parts of the world.

Professor Kader Asmal, MP
Minister of Education

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Chapter One: Introduction

The use of ICTs in society and education

1.1 A global revolution is currently taking place in education and training. It is driven by the changing nature of work, the realities of the information age, new global partnerships and an awareness of the need for equal distribution of educational opportunities.

1.2 Education systems have an obligation to deliver on public expectations of quality education for economic growth and social development. However, in the context of developing countries, quality improvement and the enhancement of excellence must take into consideration the need for increased access, equity and redress. These efforts are, in most instances, undermined by factors such as fiscal constraints, spatial barriers and other capacity-related limitations to delivery. As demonstrated in various contexts, information and communication technologies (ICTs) have the potential and capacity to overcome most of these barriers.

1.3 The expansion of ICTs is driving significant changes in many aspects of human endeavour throughout the world. At both micro and national levels, ICTs have increased the effectiveness and reach of development interventions, enhanced good governance, and lowered the cost of delivering basic social services.

1.4 As in other spheres of social and economic development, ICTs have improved the quality of education and training. It is for these reasons that Government has been quick to seize the opportunity presented by the practical benefits of ICTs as a key for teaching and learning in the twenty-first century.

1.5 The ICT revolution has had an impact on curriculum development and delivery and continues to pose new challenges for education and training systems around the world. These challenges can be summarised into three broad areas, namely:

- participation in the information society;
- impact of ICTs on access, cost effectiveness and quality of education; and
- integration of ICTs into the learning and teaching process.

The digital divide

1.6 These challenges present themselves within the context of globalisation and polarisation. They occur in a world experiencing increasing disparities between the rich and poor, among and within nations. The use of ICTs in Africa recorded a 20% increase in 2002, mostly due to increased usage in urban areas and countries with a higher GDP per capita. However, while 72.7% of Americans currently use the Internet, only 6.4% of South Africans have access to and use the Internet.

1.7 The digital divide is not only about connectivity and infrastructure disparities, it is also about:

- local content development in terms of the number and quality of local websites, local language content and the use of local online content by key sectors;
- collective knowledge generation;
- building a domestic knowledge economy and promoting online transactional capabilities for the consumer, business, and government sectors;
- developing the capacity of the workforce by improving Internet access and educational offerings in schools and colleges, creating digital libraries for universities, promoting professional training institutes, and stimulating the economy to absorb people with a variety of ICT skills;
- overcoming cultural inhibitions and insecurities about developing competence for surviving the breakneck speed of the Internet age and creating a risk-taking culture;
- co-operation and collaboration between different sectors and also within the private sector;
- creating open investment climates for the incubation, launch, acceleration and initial-public-offering phases of ICT-related SMMEs; and
- ICTs as a core feature of innovation and competitiveness.

ICTs for development in Africa

1.8 Africa is a developing continent. The lack of developed infrastructure for information and communication technologies is widening the gap between Africa and the developed world.

1.9 In response to this under-development, Africa has adopted a renewal framework, the New Partnership for Africa's Development (NEPAD), which identifies ICTs as central in the struggle to reduce poverty on the continent. ICTs provide hope for overcoming barriers of social and geographical isolation, increase access to information and education, and enable the poor to participate in the making of decisions that have an impact on their lives.

1.10 Within education and training specifically, NEPAD recognises the pivotal role of ICTs in the establishment of regional distance learning and health education programmes to improve the situation in the health and education sectors. In order to realise the benefits of ICTs, Africa must develop and produce a pool of ICT-proficient youth and students, from which the country can draw trainee ICT engineers, programmers and software developers. In pursuit of this objective, a network of training and research institutions that build high-level personal knowledge must be established and existing projects to connect schools and youth centres must be accelerated.

Government's responses to the digital divide

1.11 If South Africans are to participate in the knowledge economy, every effort must be made to prevent social exclusion. President Thabo Mbeki has underscored the

importance of ICTs for social and economic development at numerous South African and international fora. "We must continue the fight for liberation against poverty, against under-development, against marginalisation" and "… information and communication technology … is a critically important tool in that struggle" (Imbizo for African Youth, 2001).

1.12 In 2001 the Presidential National Commission on Information Society and Development (PNC on ISAD), consisting of representatives from the public and private sectors, was established. The Commission advises Government on the optimal use of ICTs to address South Africa's development challenges and enhance South Africa's global competitiveness.

1.13 At the same time, a Presidential International Advisory Council on Information Society and Development (PIAC on ISAD) was established. The Council consists of chief executive officers from major international corporations and experts active in the field of information and communication technologies. The role of the Advisory Council is to advise Government on addressing the digital divide. At its second meeting in September 2002, the Advisory Council identified three focus areas for developing ICTs:

- education;
- health; and
- small, medium and micro enterprises (SMMEs).

1.14 Through the Department of Communications, the Electronic Communications and Transactions Act (2002) leads all ICT initiatives in South Africa. It calls for the development of a five-year national e-strategy that aims to enable and facilitate electronic transactions in the public interest, including in the education sector.

1.15 Other enabling legislative and policy frameworks have been provided by various government departments in support of integrating ICTs into teaching and learning.

1.16 The challenge is to roll out ICT infrastructure that is specifically suited to Africa. Through appropriate technologies, it is hoped that South Africa will leapfrog into the new century, bypassing the unnecessary adoption cycle, and implement a solution that works now, and has the capacity to handle future developments.

1.17 Three critical elements will determine ICT's future as an effective tool for social and economic development. The first is cost. Any solution that South Africa adopts has to be cost-effective if we are to meet our developmental demands and reach the most remote parts of our country. Second is the question of sustainability. It is no use having state-of-the-art technology unless it can be sustained. Third is the efficient utilisation of ICTs. Deployment of ICTs does not guarantee their efficient utilisation. Capacity building and effective support mechanisms must accompany deployment.

1.18 Despite the difficulties that constrain the integration of ICTs into management, teaching and learning, the Ministry is determined to direct the implementation of a progressive programme for change.

1.19 It is to this end that the Department of Education will invest in national initiatives to increase access, boost the capacity of managers, teachers and learners, and provide electronic resources of the highest quality.

The current profile and distribution of ICTs in schools

1.20 Compiling an ICT profile for South African schools presents a challenge. Statistics are influenced by various factors, including the rapid redundancy rate, the level of usage and the sharing of ICT resources.

1.21 Provinces are at different levels of ICT integration in education. Significant progress has been made with provincial implementation mainly in the Western Cape (Khanya); Gauteng (Gauteng OnLine) and Northern Cape (Connectivity Project).

1.22 Over the last five years, Government, the private sector, parastatals, and non-governmental organisations have responded positively to the challenge of bridging the digital divide. Efforts include, amongst others, the following:

ICT Professional Development

- SCOPE (Finnish Development Support), SchoolNet SA and the South African Institute for Distance Education have developed 11 Teacher Development Modules for introducing ICTs into schools;
- SchoolNet SA provides online, mentor-based in-service training for teachers on introducing ICTs into the curriculum and management; and
- INTEL "Teach to the Future" Teacher Development Programme provides teacher training in ICT integration into teaching and learning.

Electronic Content Resources

- Mindset develops content resources and makes it available via satellite television, Internet multimedia and print supplements; and
- An Educational Portal initiated by the Department of Education provides digital content resources.

Infrastructure and Connectivity

- The Telecommunications Act 103 of 1996 and amended in 2001, called for the development of an Educational Network and the implementation of an e-rate (a discounted connectivity rate) for GET and FET institutions;
- Microsoft has donated software and provides teacher development and support;
- The Digital Partnership Programme provides 188 000 refurbished computers and 20 000 laptops;

- SENTEC is obliged to provide 500 schools with computer labs and teacher development, through licensing obligations;
- The 1800 MHz/3G Frequency Spectrum available to mobile operators obliges them to provide universal services to schools;
- Telkom Foundation has established Supercentres in more than 1 300 schools, providing computers, software applications, Internet connection, monthly subscription and a rent-free telephone line; and
- Telkom Foundation, together with Telkom's strategic partner Thintana, has committed over R200m to support education and training in the areas of ICT, mathematics and science.

1.23 Whilst such initiatives may be dispersed and unco-ordinated, they represent an important base from which we can learn and on which to build.

1.24 Disparities reflected in South African society also find expression in ICT integration into education. Although the number of schools with computers for teaching and learning increased from 12.3% in 1999 to 26.5% in 2002, there are still more than 19 000 schools without computers for teaching and learning.

1.25 Based on data from the Education Management Information System (Department of Education, Pretoria) and information received from provinces, Table 1 reflects the distribution of ICTs in schools across all provinces.

Table 1: Schools with computers, by province (2002)

Provinces	Schools with computers	Schools with computers for teaching and learning
Eastern Cape	8.8%	4.5%
Free State	25.6%	12.6%
Gauteng	88.5%	45.4%
KwaZulu-Natal	16.6%	10.4%
Mpumalanga	22.9%	12.4%
Northern Cape	76.3%	43.3%
Limpopo	13.3%	4.9%
North West	30.5%	22.9%
Western Cape	82.4%	56.8%
National	**39.2%**	**26.5%**

1.26 Analysis of the data reveals that the growth rate of schools that acquired computers between 2000 and 2002 averages 59% and was higher among secondary schools than primary schools. If the same growth rate is maintained over the next two years, only 9 278 schools will have computers by the end of 2004.

1.27 Despite some extreme variations, schools in Gauteng, Northern Cape and Western Cape have, on average, a better ICT infrastructure than schools in Eastern Cape and Limpopo. Schools in Free State, KwaZulu-Natal, Mpumalanga and North West hold a middle position.

1.28 E-mail facilities are beginning to be used more extensively in many schools as a management and administrative resource, and also in some cases, as a teaching and learning resource.

1.29 Internet access is becoming more common, but the use of the Internet for teaching and learning purposes is very limited, due to high connectivity and telecommunication costs, lack of local content and examples, and inadequate technical and pedagogical support at local level.

1.30 In both primary and secondary schools, the teaching of basic computer principles and word processing skills forms the most important component in the teaching of computer literacy. Limited integration into teaching and learning is also evident.

1.31 Beyond the issue of access, there is a gap in the ability of learners and teachers to use these technologies effectively, to access high-quality and diverse content, to create content of their own, and to communicate, collaborate and integrate ICTs into teaching and learning.

1.32 The present situation, as illustrated above, cannot be maintained if South Africa is to address the digital divide. Like most parts of the world, the South African education and training system has to respond to the pressures and challenges posed by the information revolution. It is for this reason that Government has expressed a strong commitment to the use of ICTs in education.

Chapter Two: e-Education

e-Education defined

2.1 In the South African context, the concept of e-Education revolves around the use of ICTs to accelerate the achievement of national education goals. e-Education is about connecting learners and teachers to each other and to professional support services, and providing platforms for learning. e-Education will connect learners and teachers to better information, ideas and one another via effective combinations of pedagogy and technology.

2.2 The challenge is to transcend the mere exchange of information and to transform e-Education into a range of learning activities that meet educational objectives.

2.3 e-Education is more than developing computer literacy and the skills necessary to operate various types of information and communication technologies. It is the ability to:

- apply ICT skills to access, analyse, evaluate, integrate, present and communicate information;
- create knowledge and new information by adapting, applying, designing, inventing and authoring information;
- function in a knowledge society by using appropriate technology and mastering communication and collaboration skills.

2.4 e-Education views ICTs as a resource for reorganising schooling, and a tool to assist whole-school development. It includes ICTs as:

- a tool for management and administration;
- a resource for curriculum integration;
- a communication tool;
- a collaborative tool for teachers and learners; and
- a learning environment that advances creativity, communication, collaboration and engagement.

2.5 ICTs, when successfully integrated into teaching and learning, can ensure the meaningful interaction of learners with information. ICTs can advance high order thinking skills such as comprehension, reasoning, problem-solving and creative thinking. Success in the infusion of ICTs into teaching and learning will ensure that all learners will be equipped for full participation in the knowledge society before they leave further education and training (FET) institutions.

2.6 Moreover, these learners are likely to utilise e-Government processes, not only to acquire and use information, but also to implement public sector reforms that can

enhance transparency in government operations. These learners will use ICTs to enhance interaction between citizens, governmental organisations and public and elected officials.

2.7 These learners will invent new ways of using ICTs to realise the Department of Education's vision of developing citizens who are critical and active lifelong learners.

2.8 The challenge facing our education and training system is to create a learning culture that keeps pace with these changes, and equips people with the knowledge, skills, ideas and values needed for lifelong learning. Our education system must create graduates who use information effectively and keep abreast of technological advances.

Information and communication technologies defined

2.9 ***Information technology (IT)*** is a term used to describe the items of equipment (hardware) and computer programmes (software) that allow us to access, retrieve, store, organise, manipulate and present information by electronic means. Personal computers, scanners and digital cameras fit into the hardware category; database programmes and multimedia programmes fit into the software category.

2.10 ***Communication technology (CT)*** is a term used to describe telecommunications equipment through which information can be sought, sent and accessed - for example, phones, faxes, modems and computers.

2.11 ***Information and communication technologies (ICTs)*** represent the convergence of information technology and communication technology. ICTs are the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge.

2.12 ***Digital literacy*** refers to the ability to appreciate the potential of ICTs to support innovation in industrial, business, learning and creative processes. Learners need to have the confidence, skills and discrimination to adopt ICTs in appropriate ways. Digital literacy is seen as a "life skill" in the same category as literacy and numeracy.

2.13 ***Information literacy*** is the ability to locate, evaluate, manipulate, manage and communicate information from different sources. As learners become increasingly information-literate, they develop skills in discrimination, interpretation and critical analysis. ICTs offer opportunities for higher-order thinking and creativity in processing, constructing and conveying knowledge.

2.14 ***e-learning*** is flexible learning using ICT resources, tools and applications, focusing on interaction among teachers, learners, and the online environment, and on

collaborative learning. e-learning usually refers to structured and managed learning experiences, and may involve the use of Internet, CD-ROM, software, other media and telecommunications.

2.15 ***Online learning*** refers more specifically to the use of the Internet and associated web-based applications as the delivery medium for the learning experience.

The significance of e-Education

2.16 New models of learning are radically changing our concept of education. Education for human development in the learning society requires collaborative learning, and focuses on building knowledge. These changes arise from shifts in educational goals, and from new concepts in learning and knowledge creation.

2.17 The Department of Education believes that developments in ICTs create access to learning opportunities, redress inequalities, improve the quality of learning and teaching, and deliver lifelong learning. ICTs can accommodate differences in learning styles and remove barriers to learning by providing expanded opportunities and individualised learning experiences.

2.18 Experience worldwide suggests that ICTs play an important role in the transformation of education and training. ICTs can enhance educational reform by enabling teachers and learners to move away from traditional approaches to teaching and learning. In a transformed teaching and learning environment, there is a shift from teacher-centred, task-oriented, memory-based education (with technology at the periphery), to an inclusive and integrated practice where learners work collaboratively, develop shared practices, engage in meaningful contexts and develop creative thinking and problem-solving skills.

2.19 There is sufficient empirical evidence that investments in ICTs yield positive results for learners and teachers. Studies have demonstrated improved learner achievement in:

- application and production of knowledge for the real world;
- the ability of learners to manage learning;
- the ability to promote achievement for learners who experience barriers to learning; and
- accessing information that increases knowledge, inquiry and depth of investigation.

2.20 Furthermore, the use of ICTs has demonstrated improved inventive thinking skills, such as creativity, problem solving, higher-order thinking skills and reasoning, along with improved effective communication. Improvements in interpersonal skills, such as writing, public speaking, teamwork and collaboration, and improved productivity skills, including creating high-quality products, have also been reported.

2.21 ICTs encourage a teaching and learning milieu which recognises that people operate differently, have different learning styles and have culturally diverse perspectives. ICTs embrace inclusive education by providing opportunities, alternative methods of instruction and flexible assessments for learners who experience barriers to learning.

2.22 Benefits to the broader society include increased opportunities for lifelong learning, communication and exchange essential to democratic living, and the creation of a pool of globally competitive human resources.

e-Education policy goal

2.23 Every South African learner in the general and further education and training bands will be ICT capable (that is, use ICTs confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community) by 2013.

e-school development

2.24 In order to achieve the e-Education goal, schools will have to develop into learning organisations consisting of a community of both teachers and learners. In such schools, teachers and learners will be able to function across three dimensions:

- **The operational dimension** refers to the skills that are necessary for the use of new information and communication technologies. Demonstrated acquisition of these skills is as important as the process by which they are acquired. Approaches that employ an elaborate human network of support among teachers and learners, and adopt a collective approach to knowledge and problem solving, are rich and powerful for the processes of learning and knowledge of ICTs in education. In order to facilitate collective learning, provincial departments will establish opportunities for schools to learn together and from each other about ICTs in education.
- **The cultural dimension** involves stepping into the culture that supports the practice of using ICTs for educational purposes, regardless of one's level of expertise. This requires teachers to move beyond a purely instrumental role that views ICTs as an educational add-on, to regarding technology as something that poses interesting and important questions for administration, curricula and pedagogy.
- **The critical dimension** invites teachers and learners to step outside the culture and challenge assumptions that are embedded in the success stories about ICTs inside and outside of schools. This requires a critical dialogue, analysis among teachers, and research resources to provoke and expand teachers' perspectives on the benefits of ICTs.

2.25 e-schools will therefore be characterised as institutions that have:

- learners who utilise ICTs to enhance learning;
- qualified and competent leaders who use ICTs for planning, management and administration;
- qualified and competent teachers who use ICTs to enhance teaching and learning;
- access to ICT resources that support curriculum delivery; and
- connections to ICT infrastructure.

2.26 e-schools will connect with the community by:

- allowing community access to its computer facilities after hours;
- receiving support from the community and local SMMEs to maintain and sustain ICT interventions; and
- serving as a venue for business advisory services and training for community-based small computer and repair businesses.

2.27 The Department of Education will determine the basic ICT tools to be supplied to each institution defined as an e-school.

Chapter Three: The Use of ICTs in Education

e-learning (learning through the use of ICTs)

3.1 The introduction of information and communication technologies (ICTs) in education represents an important part of Government's strategy to improve the quality of learning and teaching across the education and training system. The policy intention is to focus on learning and teaching for a new generation of young people who are growing up in a digital world and are comfortable with technology. Our schools must reflect these realities.

3.2 The policy intention is not just to build technical skills, but also to use ICTs to extend and enrich educational experiences across the curriculum. The objective is to build digital and information literacy so that all learners become confident and competent in using technology to contribute to an innovative and developing South African society.

3.3 e-learning is about learning and teaching philosophies and methodologies within the context of outcomes-based education, using ICTs in the learning environment. Enriching the learning environment through the use of ICTs is a continuum; it is a process that takes learners and teachers through **learning about ICTs** (exploring what can be done with ICTs), **learning with ICTs** (using ICTs to supplement normal processes or resources), **and learning through the use of ICTs** (using ICTs to support new ways of teaching and learning).

3.4 While e-learning will not replace teachers, it will enhance the quality and reach of their teaching and reduce the time spent on administrative chores. In introducing e-learning, we must make sure that we balance it with other teaching and learning methods. e-learning should recognise that its value is linked to its suitability to individual learning and teaching styles and strategies.

3.5 Learning through the use of ICTs is arguably one of the most powerful means of supporting learners to achieve the nationally-stated curriculum goals. In particular, the use of ICTs for learning encourages:

- learner-centred learning;
- active, exploratory, inquiry-based learning;
- collaborative work among learners and teachers; and
- creativity, analytical skills, critical thinking and informed decision-making.

3.6 e-learning will be introduced as an integral part of an environment where teaching is transformed and where learning is an ongoing, creative process. This requires

a changing teaching and learning methodology in which teachers and learners will have access to:

- high quality, relevant and diverse resources, beyond what school libraries are currently providing,
- means of communicating and collaborating with other learners and teachers; and
- opportunities to create and present new knowledge.

3.7 Our quest for active contextual learning to promote understanding will be supplemented by multimedia applications that require learners to create realistic contexts for problem-solving, data analysis and the creation of knowledge in the learning process.

3.8 The introduction of learning through the use of ICTs is not about creating interesting tasks for learners, but rather to deepen their understanding, requiring the use of higher-order thinking skills and taking learners beyond recall, recognition and reproduction of information to evaluation, analysis, synthesis and production of arguments, ideas and performance.

3.9 Currently, schools are tackling issues of excellence and equity. They are creating new learning environments that model a spirit of inquiry, inclusiveness and interdependence with learners who represent a wide array of cultures, languages and social backgrounds. Within this context, e-learning has the potential to offer teachers and learners access to a variety of learning and teaching support material that promotes the appreciation of diversity, a collective identity across the school and begins to connect schools to the broader societal goals.

Assessment

3.10 Assessment is an important driver in education and, if not well-managed, can become a barrier to innovation. Once ICTs are embedded in learning and teaching processes, learners will want to be assured that assessment effectively tests the level of acquisition of skills and competencies acquired through e-learning.

3.11 e-learning will require teachers and learners to reflect upon and improve their approaches and strategies to teaching and learning. The efficient use of e-learning methodologies has the potential to enhance the quality and value of assessment.

3.12 Data analysis techniques can assist teachers to track learner achievements and review teaching strategies according to the insights gained. Teachers will also be able to give learners immediate feedback on progress, identify areas of weakness, and design necessary and appropriate support systems in a timely fashion.

3.13 The administration of assessment is a labour-intensive exercise. The use of ICTs in assessment has the potential to increase the efficiency and to streamline and safeguard data-transfer processes.

3.14 ICTs have the potential to simplify the administration of assessment. Time saved by teachers on administrative routines can be spent on giving direct support to learners and improve the quality of contact time.

3.15 In adult education and training, online assessment has the potential to increase participation by overcoming barriers such as location, time and cost, through "on demand assessment". Adult learners who progress at their own pace and wish to demonstrate skills acquired at the workplace should not be tied down to an inflexible timetable.

Increasing the efficiency and effectiveness of management and administration

3.16 ICTs are increasingly allowing schools and school systems greater access to timely, relevant and detailed information on many of the functions of schools. More complex information can now be collected, analysed and used at both school and system levels.

3.17 The rapid development of ICTs, the increased pressure for effective management of organisational performance, and a preference for self-managing schools have resulted in the development of powerful management information systems. As with other types of organisations, schools and school systems are increasingly using management information systems for planning, monitoring, improvement and accountability purposes. ICTs have the capacity to automate processes and save time, thereby freeing school managers to focus on instructional leadership.

3.18 If managerial functions at school and other levels of the education system are to be carried out efficiently and effectively, it is necessary that information of high quality is available at all times to inform decision-making. This points to the need for a reliable information system that provides defined objectives and the right information to the right people, at the right time and in the right way.

3.19 Educational leaders do not yet fully appreciate the benefits of e-learning and e-administration for schools and for provincial and district offices. It is important that educational leaders at all levels of the system are provided with the necessary support to enable them to manage the introduction of ICTs and the related change processes.

3.20 In order to increase the administration of education through the use of computerised information systems, the Department will develop standardised templates for management, statistical analysis, record-keeping and reporting.

Chapter Four: The Policy Framework

Equity

4.1 The use of ICTs in schools always involves choices about resource allocation. The drive for additional resources for schools results from prior access to information and resources. The technically able and well equipped can often make more compelling cases for re-equipping than those who have poor or no resources. Technology tends to amplify advantage.

4.2 It is for this reason that the principle of equity should inform our approach and provide an alternative basis for supplying access to information and the allocation of resources. Equal access and equal competence must be the objective of our education system.

Access to ICT infrastructure

4.3 The impact and effectiveness of ICTs rest on the extent to which end-users (learners, teachers, managers and administrators) have access to hardware, software and connectivity. For e-learning to be successful, learners must have regular access to reliable infrastructure.

Capacity building

4.4 ICTs are most effectively applied when viewed as integral to teaching and learning by both learners and teachers. ICT integration supports outcomes-based education, which encourages a learner-centred and activity-based approach to education and training. Any ICT integration requires that teachers engage in rethinking and reshaping their engagement with the curriculum.

4.5 Many teachers have grown up in environments with limited electronic technology, and thus find the adaptation to working with ICTs more difficult than their learners do. A programme that urgently addresses the competencies of teachers to use ICTs for their personal work, in their classrooms, must be developed. This will require extensive staff development and support. Thus, ICTs will be central to the pre-service training of recruits and the ongoing professional development of practising teachers.

Norms and standards

4.6 Current initiatives and donations of software and hardware have sparked debates on issues of open source, copyright, licensing, refurbishment and inter-operability, as well as human resource capacity building.

4.7 The need for national norms and standards for educational ICTs cannot be overemphasised. Calls for the scaling up of provincial programmes, in order to

ensure equitable access to learning opportunities and to improve learner performance have been made repeatedly.

4.8 The aim of creating national standards for ICTs in teaching and learning is to clarify compliance requirements, responsibilities and implementation mechanisms. Standards of teacher development, content, connectivity, hardware, software and community engagement cover the following areas:

- teacher competencies consistent with the National Qualifications Framework (NQF) levels;
- educational soundness of electronic content, for example, relevance, reliability, accessibility and usability;
- inter-operability of hardware and software, and connectivity to promote durability, scalability (to be delivered to a large number of learners) and flexibility;
- rights management, for example, licensing, branding, trading and legal compliance;
- network and information security; and
- community engagement.

4.9 Educational soundness standards for content will include:

- content relevance and reliability - the purpose of the content is readily apparent; it adds value to teaching and learning tasks, includes processes and criteria for learner assessment, and is compliant with outcomes-based education;
- accessibility - content is compatible and inter-operable with existing software and hardware; it complies, where feasible, with accessibility standards for learners with disabilities and barriers to learning; and
- usability - content is easy to use and recognise.

4.10 Inter-operability of content standards will include:

- accessibility - content must be accessible from many locations;
- inter-operability - learning components developed with one platform or set of tools can be used in another location with a different platform or set of tools;
- durability - technology changes can be made without redesign or recoding;
- scalability - the ability of a system (both hardware and software) to be distributed to large numbers of learners in diverse locations; and
- flexibility - the ability to use and remix learning components from a range of sources.

4.11 Rights management norms will include:

- equitable rights licensing - negotiation of intellectual property licensing will benefit the education sector and investment shareholders, as well as stimulate the education resource development market;
- branding - provisions will be made for common structure, format and expression of rights information;
- flexible rights trading - rights can be traded in accordance with the digital, modular and dynamic nature of learning content; and
- legal rights compliance - licensing rights are honoured and trading rights are supported.

Chapter Five: Strategic Objectives

ICT professional development for management, teaching and learning

Every teacher, manager and administrator in General and Further Education and Training must have the knowledge, skills and support they need to integrate ICTs in teaching and learning.

5.1 The Department of Education must develop a national framework for competencies for educators (teachers, managers and administrators), and the use of ICTs must be integrated into pre-service and in-service training. This will require creating an appropriate accreditation within the National Qualifications Framework, revising the Norms and Standards for Educators, and reviewing Department of Education in-service training policies and programmes to include ICTs when appropriate.

5.2 Standards for professional competency in ICT utilisation will consider the following levels:

- entry - computer literate, able to use computers and teach learners to use computers;
- adoption - able to use various technologies, including the computer, to support traditional management, administration, teaching and learning;
- adaptation - able to use technology to enrich the curriculum and use integrated systems for management and administration;
- appropriation - able to integrate technology into teaching and learning activities, and use integrated systems for management and administration within a community context; and
- innovation - prepared to develop entirely new learning environments that use technology as a flexible tool, so that learning becomes collaborative and interactive. Technology is integrated as a flexible tool for whole-school development.

5.3 The Department of Education will collaborate with the Education, Training and Development Practices SETA to access the skills levy for in-service ICT training programmes.

5.4 Each school will have a dedicated teacher to manage ICT facilities and champion the use of ICTs in the school.

5.5 Support in the form of incentives will encourage teachers, managers and administrators to integrate technology into their daily activities and areas of responsibility. This will facilitate technological change, experimentation with new ideas, and risk taking. The Department of Education will, in collaboration with

relevant government departments, ascertain possibilities for subsidies and special loans to encourage teachers to purchase computers for personal use.

5.6 The level of proficiency in the use of ICTs will become an integral part of the Development Appraisal System and whole-school evaluation.

ICT professional management

5.7 To realise the e-Education goal, educational management needs to move beyond the initial stages of ICT planning and experimentation, and make focused capital investments. Educational leaders at all levels (national, provincial, district and institutional) must leverage ICTs as a tool for improved educational performance and reorganise educational institutions accordingly. Ultimately, educational leaders must view ICTs as an essential transformative tool for education and training, and individually promote and support the use of ICTs in his/her institution.

5.8 Institutional development plans must incorporate ICT development plans. The plans must address the initial cost of ICTs, infrastructure upgrades, security, recurring costs, replacement costs, maintenance and support. In addition, plans should address teacher development, skills transfer, support, and additional human resource requirements.

5.9 Provincial education departments will plan and budget for training district-level subject specialists in order to provide ongoing professional and technical support.

ICTs-in-Practice Awards

5.10 Integral to the strategy of motivating teachers and schools to integrate ICTs into their daily functions, the Department of Education will continue with its incentive programme for the Most Improved Schools Awards in the category of Technology-Enhanced Learning Award. The aim of this award will be to celebrate excellence in the creative use of ICTs and to inspire learners and teachers to exploit the full potential of this rich and exciting technology.

5.11 Through this incentive scheme, models of excellent practice will be identified and used to develop and promote effective practices in the use of ICTs in teaching, learning and leadership. The award will allow the Department of Education to share good practice with the wider teaching community while rewarding individuals and teams who demonstrate exemplary practice in the use of ICTs in teaching and learning.

The role of higher education

5.12 The Department of Education and the provincial education departments will collaborate with higher education institutions to design and deliver in-service and pre-service training programmes for teachers, managers and administrators.

5.13 The Department of Education will ensure the inclusion of ICT integration competencies for teachers, administrators and managers in accredited pre-service teacher training programmes delivered by higher education institutions.

5.14 Accredited pre-service teacher training programmes will provide students with the basic knowledge, skills and attitudes required to integrate ICTs into subjects of specialisation. This will require that each graduating teacher is able to combine knowledge of the learning process and instructional systems theory with various forms of media and learning environments, to create the most effective and efficient learning experiences.

5.15 The training will model the use of ICTs as a mode of delivery, allowing for greater levels of collaboration, inquiry, analysis, creativity and content production.

Electronic content resource development and distribution

The school curriculum in General and Further Education and Training must be supported through effective and engaging software, electronic content and online learning resources, and teachers, content developers and administrators who contribute effectively to these resources.

5.16 Conventional print media, as well as the use of devices such as conventional radio broadcast and tape recorders, will continue to be used in e-schools. However, the system has relatively under-developed digital teaching and learning resources at present. It is crucial therefore, that an education-industry partnership be developed to enhance innovative, effective and sustainable e-learning resources.

5.17 In the interim, the Department of Education will initiate the collection and evaluation of existing digital, multimedia material that will stimulate all South African learners to seek and manipulate information in collaborative and creative ways.

5.18 Digital content is critical to e-Education because it can be easily and randomly accessed, adapted and manipulated, and is accessible from many locations.

Indigenous languages

5.19 The Department of Education, in collaboration with the Department of Arts and Culture, will promote the adaptation and development of local content into indigenous languages. While there is a large amount of curriculum material and resources available on the Internet, this online content must be evaluated for educational relevance prior to adaptation and possible translation into indigenous languages.

Creating electronic content

5.20 The Department of Education will promote the generation of new electronic content that is aligned with outcomes-based education. Priority areas for national rollout

include South African history, technology, mathematics, sciences and the biology of, and social behaviour associated with, HIV/AIDS.

Digital libraries

5.21 School libraries are currently unable to support resource-based learning in outcomes-based education. The Department of Education will promote access to digital libraries. Information available in public libraries, museums and government offices should be made available in digital formats and networked applications.

National education portal

5.22 The Department of Education, in collaboration with the provincial education departments, will initiate the development of a national education portal that is linked with provincial and privately owned portals. It will be a distributive tool and a content and information-sharing platform, hosting communications and collaboration applications for learners, teachers, administrators, managers and parents. It will serve as a nucleus for building web-based resources for teachers, learners and the community, making it possible to create new knowledge and add to the existing knowledge base.

5.23 The national education portal will require hosting services that will be distributed and decentralised in order to maximise efficiency and minimise duplication.

5.24 A group of experts will oversee the content development process of the portal and drive the process.

Information management

5.25 The Educational Management Information System (EMIS) will be accessible through the national education portal.

5.26 The Department of Education will improve the electronic system for the transfer of management information between GET and FET institutions, and district, provincial and national offices. This will require the identification of national-level reports and the development or procurement of administrative software packages accessible to all institutions.

Access to ICT infrastructure

Every teacher and learner in General and Further Education and Training must have access to ICT infrastructure.

5.27 National and provincial hardware and software requirements and rollout targets must be set by projecting the long-term technological needs of South Africa. This will be based on anticipated educational needs and objectives.

5.28 The provincial education departments will establish a desired level of technology resources (hardware and software) for each GET and FET institution and assess the

adequacy of existing equipment and facilities. At the very least, every GET and FET institution will have access to technology in order to:

- manage administrative functions;
- access electronic learning materials;
- connect to information sources outside the classroom;
- communicate with others in and beyond the institutional boundaries;
- collaborate with others in and beyond the institutional boundaries; and
- create and add to the knowledge base.

5.29 National and provincial managers and administrators must plan and mobilise funds for provincial, district and institutional resources to support hardware and equipment installation, as well as maintenance and repair thereof.

5.30 The Department of Trade and Industry, in support of the provision of ICTs to and within schools, will review the trade policies for procuring ICT-related goods and services, as well as ensuring balance between (a) reducing import taxes and bureaucratic processes for imports and (b) developing local ICT industries, including pricing and taxation of e-services, technical support specialists, local or foreign-owned computer vendors, computer assembly plants and software manufacturers.

5.31 The Department of Education will develop norms and standards for new and refurbished hardware and software for use in GET and FET institutions and revise it annually. These standards must be consistent with the technical criteria set forth by the Information Technology Acquisition Centre (ITAC) procurement policy and procedures. Criteria for technical appropriateness include:

- technical requirements, including durability and ease of maintenance;
- systems life expectancy, that is, whether the technology under consideration or tendered is obsolete or relatively new;
- inter-operability, or the ability of ICTs to communicate between different tools and platforms;
- acceptable sources of power;
- safety and security of equipment; and
- best practices with regard to technical requirements and sustainability.

5.32 Central to equipping schools with an ICT infrastructure is the provision of electricity and a physical infrastructure. Although there are ICT provisions that use alternative sources of energy, the Department of Education will work with the Department of Minerals and Energy to prioritise the electrification programme for GET and FET institutions.

5.33 The Department of Education will develop norms and standards for new and refurbished school buildings and facilities for the use of ICTs.

Equipment inter-operability

5.34 The Department of Education will establish minimum inter-operability standards that do not preclude new or better products, to guide the purchase of hardware, software and other technologies for GET and FET institutions within provinces. Provincial education departments must prepare guidelines for GET and FET institutions and districts for acquisition of equipment, including software, that is compatible with provincial networks. The guidelines will describe how the provincial education departments will ensure that equipment in GET and FET institutions meets the highest possible level of inter-operability and open system design as per the minimum content and hardware/software inter-operability standards.

Maintenance and refurbishment of computers

5.35 The Department of Education will promote and support the establishment of training programmes and small business incubators for the maintenance and refurbishment of computers. This will be done in conjunction with relevant government departments and the providers of further education and training programmes, as well as higher education institutions that have computer science programmes.

Safety and security

5.36 The Department of Education will develop norms and standards to ensure the safety and security of ICTs.

Connectivity

Every teacher and learner in General and Further Education and Training must have access to an educational network and the Internet.

5.37 The Telecommunications Act 103 of 1996 and amended in 2001, makes provision for the development of a network for education (EduNet) that will connect all schools to each other and to the Internet through multimedia laboratories. The Departments of Education and Communications will initiate the development of a national education network in collaboration with other relevant government departments. The education network will be designed to serve the goal of universal access for every e-school. The education network will provide high-speed access for learning, teaching and administration.

5.38 The Department of Education recognises the need for high-speed access and alternative means of access in addition to dial-up Internet access.

Network security

5.39 The Department of Education, in collaboration with the Department of Communications and the State Information Technology Agency (SITA), will develop adequate measures, such as firewalls and virus protection software, to protect the security of network resources and to protect users. The Department of Education will

establish standards and develop guidelines for the use of networks and rights management. The standards will address Internet safety and responsible and age-appropriate technology use.

Recurring costs for connectivity

5.40 The Minister of Communications will determine the formulae for apportioning of universal service funds for the payment of subsidies to GET and FET institutions for the procurement of Internet services and the equipment required to access the Internet, as stated in the Telecommunications Act 103 of 1996 and amended in 2001.

5.41 The legislated e-rate, a discounted connectivity rate, is designed to ensure that the cost of basic connectivity is affordable. Government will implement the e-rate. The discounted e-rate will be reviewed, in conjunction with the Universal Service Agency obligations, against the recurring connectivity costs.

Community engagement

Schools must work in partnership with families and the wider community to ensure shared knowledge about ICTs and extended opportunities for learning and development through ICTs.

5.42 Community engagement in ICT planning, implementing and monitoring is crucial for the formation, maintenance and security of an e-school.

5.43 The e-school will also act as a hub for multi-purpose services, such as adult continued learning, primary health care and other local government services.

5.44 Moreover, community members will aspire to develop community-based small, medium and micro enterprises to provide maintenance and support services for hardware and connectivity to the e-school.

Community access

5.45 Government will support community access to e-schools. The objective will be to increase opportunities for communities to use e-school resources, develop their computer and Internet skills, and take advantage of services offered through ICTs. In return the community will support the sustainability of ICTs in the e-school.

5.46 e-schools will be encouraged to engage with the local community in order to become centres of community life and obtain support through the community. The local community will be involved in the maintenance and security of e-school ICT infrastructure, as well as supporting e-schools by availing ICT experts, specialists and champions in the community who are willing to volunteer their skills and expertise.

5.47 Schools can avail their ICT laboratories as study support centres for learners and adult learners. Laboratories will have to be safe and supportive environments for after-school and work-related studies. These study support centres will become study environments for learners whose home environments are not sufficiently conducive to study.

Community-based SMMEs

5.48 Government will facilitate the establishment of training programmes and small-business incubators to develop community-based computer repair and maintenance businesses and other ICT enterprises. This will require co-ordination with government departments and the business sector, as well as higher education institutions and institutions providing further education and training programmes. These SMMEs will provide technical and maintenance support to GET and FET institutions on an ongoing basis.

Research and development

The research and development community must continuously assess current practices, and explore and experiment with new technologies, methodologies and techniques that are reliable and will support teachers and administrators in e-learning and e-administration.

5.49 The best way to learn and understand how to improve practices is through research, evaluation, experimentation and collaboration. To this end, Government must bring together teachers, researchers and the ICT industry in an action-oriented research and development forum, to evaluate and develop leading-edge applications for e-learning.

5.50 Research must be linked to practice. The teaching profession has an obligation to play an important role in generating ideas, testing prototypes and implementing strategies. Research for e-learning should be closely linked to other general research on learning. The Department of Education, in collaboration the Departments of Communications and Science and Technology, the teaching profession, higher education institutions and research agencies, will formulate a research agenda on ICTs for e-learning.

Advanced Institute for Information and Communication Technology (AIICT)

5.51 Cabinet has approved the concept for the establishment of an Advanced Institute for ICT. The AIICT will undertake world-class, needs-based and applied research in ICTs, leading to development and innovation for the benefit of the economy, to advance the quality of life of all South Africans and advancement of the region as a whole. The AIICT will also contribute to the education and training of high-level ICT knowledge workers through collaboration and partnerships with higher education institutions.

5.52 The work of the AIICT, through its research and high-level human resource development, will support the implementation of e-learning approaches throughout the education system.

Chapter Six: Funding and Resourcing

Need for investment

6.1 While the Ministry of Education is realistic about the fiscal constraints affecting Government, it also accepts that bridging the digital divide and building an integrated e-Education System will require greater investment in the education sector.

6.2 Sustained and predictable funding sources for technology are needed in order to realise a large-scale impact over time. The initial upfront and long-term investments to achieve e-Education will be huge.

6.3 The ongoing costs of providing access to technology, including teacher development, pedagogical and technical support, digital content and telecommunication charges, as well as maintenance, upgrades and repairs are enormous.

Principles for funding and resourcing

6.4 The Medium Term Expenditure Framework (MTEF) will provide a sustainable source for the implementation of e-Education, with a greater degree of predictability and accountability for the planning and funding of e-Education.

6.5 Given the magnitude of the task and additional resource requirements, investment in ICTs cannot be the sole responsibility of Government. Investment from the private sector and other resources will be required to supplement Government contributions.

6.6 The programme for rolling out ICTs across the system will require a long-term planning framework linked to a funding and resourcing model. The primary objective of such a planning and co-ordination mechanism will be to ensure that the deployment of funds and resources meets the equity and efficiency objectives of the system.

6.7 Implementing e-Education must ensure that available resources are maximised and utilised effectively through effective procurement, value for money, and management for sustainability. Funding models and procurement mechanisms should achieve economies of scale. Rollout plans should be affordable, scalable and sustainable, based on generic activity-based design tools for teachers and learners.

Sources of funding

6.8 Based on the above principles, the Department of Education, with other government departments and the private sector, will mobilise additional funds and resources.

6.9 Sources of funding will include the following:

- licensing obligations of telecommunication providers;
- private sector donations and support from international development assistance agencies;
- appropriate public-private partnerships to ensure the sustainability of the e-Education policy implementation; and
- identification of research frameworks for academic research and development, for research bodies and institutions to solicit funding for research in e-Education.

6.10 The Department of Education will co-ordinate, with the Department of Communications and the Universal Service Agency, the utilisation of the universal service fund, generated through universal service agreements and administered by the Universal Service Agency. The co-ordination will involve direct subsidisation to GET and FET institutions in impoverished areas and differentiated pricing structures to enable access for all institutions.

6.11 One of the critical factors to the success of ICT implementation is sustainable connectivity and electricity services. The Department of Communications, through the Telecommunications Act 103 of 1996 and amended in 2001, called for the implementation of an e-rate for GET and FET institutions to address the recurrent costs to connectivity, which is based on ongoing cost requirements reviews. Similar rates will be negotiated for electricity.

Chapter Seven - Implementation Strategies

System-wide approach

7.1 A number of ICT initiatives are being implemented across the length and breadth of the country. However, these initiatives have not yet reached every school and district. Teacher access to ICTs is limited, even though, as evidence suggests, personal access has a strong influence on the quality of ICT integration into teaching and learning.

7.2 Government has the responsibility to ensure that the benefits of e-learning are enjoyed by all. An implementation strategy based on the principle of universal excellence for learners, teachers, managers and schools should inform and direct all efforts. e-learning should be the mainstream activity of every school and classroom.

7.3 The Department of Education, working with the private sector and social partners in the deployment of ICTs, will drive a system-wide campaign to maximise the benefits of e-learning to schools, classrooms, learners, teachers, managers and communities.

7.4 From the initial provision of ICTs in schools, sufficient enthusiasm, understanding and expertise has been generated to justify the move to a system-wide approach that will embed e-learning in ways that will benefit all learners and teachers across the education system.

7.5 The Department of Education will adopt a multi-pronged strategy for the gradual integration of ICTs at all levels of the education and training system. National targets will guide the implementation of the e-Education policy. Benchmarks and annual targets will be set for the following:

- number of e-schools and their level of e-readiness;
- number of teachers trained at various levels of ICT proficiency;
- type of content available to learners;
- ratio of learners to computers;
- range of technologies used in classrooms; and
- Internet connectivity.

Co-ordination and collaboration

7.6 This White Paper provides a policy framework within which government departments and other stakeholders will collaborate to ensure that institutions are supported to meet the needs and interests of learners and communities.

7.7 The e-Education policy provides a strategic framework for national co-ordination with the Presidential National Commission on Information Society and

Development, the provincial education departments, other governmental departments, business and industry, non-profit organisations, higher education institutions, general and further education and training institutions, and local communities to implement e-Education.

7.8 The policy directs the establishment of a Ministerial e-Education Advisory Council consisting of ICT champions from the public sector, academia, and private and civil society. The Advisory Council will deliver annual reports on the status of e-Education in South Africa and advise the Department of Education on implementation. The annual reports will track and monitor progress on investments in ICTs, as well as compare improvements in educational outcomes. The reports will reflect on issues such as the impact of ICTs upon the operation of educational institutions, the relationship between quality and effectiveness of teachers and ICTs and the impact of ICTs on learner achievement and the development of skills for the 21st century. The Advisory Council will provide advice on future directions involving ICTs in education.

7.9 An e-Education inter-departmental team will monitor and manage the implementation of the e-Education policy and foster inter-governmental collaboration. The composition of this team will include senior officials from all the government departments that have key responsibilities in the implementation of the e-Education policy.

7.10 Crucial to co-ordination is the development, implementation and monitoring of targets. This will be reflected in national and provincial ICT plans.

Monitoring and evaluation

7.11 Regular reviews and periodic evaluations will be conducted to inform the implementation process. The direction and focus will benefit from insights gained and lessons learned from the reviews.

7.12 Evidence of success will be captured against nationally agreed indicators and targets. The data collected will guide decisions and inform continuous improvement of the implementation of the e-Education policy.

7.13 Each general and further education and training institution will report data on e-school technology assessment readiness and targets (e-START). Data sets will include baseline data, and set targets to become an e-school.

7.14 The data sets will include information on infrastructure, connectivity, management, teacher development, learner achievement, assessment and educational benefits to be gained from ICT applications in e-schools.

7.15 The information will be aggregated at district, provincial and national levels.

Planning cycles

7.16 The achievement of the e-Education policy goal, that every learner in the general and further education and training bands will be ICT capable by 2013, calls for a long-term strategy that will provide a framework for specific priorities and actions to be implemented over a period of time. The implementation strategy set out a multi-year programme of action, namely; Phase I - 2004/07; Phase II - 2007/10 and Phase III - 2010/13.

7.17 The targets set out in the implementation strategy will guide the initial medium-term process of integrating ICTs into e-learning, and will identify key national goals, initiative and strategic resource allocation.

7.18 A modest, sustained and systematic growth plan is preferred. During this time, realistic targets should be set and communicated upfront to the Department of Education, public and private sector. The Department of Education recognises that provinces are at different levels of ICT development and that each province will set its own targets within the broader framework. Such an approach will allow the provinces time to set in place the required basics, to develop, identified capacities and to develop effective growth management strategies within different timeframes.

PHASE I

ENHANCE SYSTEM-WIDE AND INSTITUTIONAL READINESS TO USE ICTs FOR LEARNING, TEACHING AND ADMINISTRATION

BUILD AN EDUCATION AND TRAINING SYSTEM TO SUPPORT ICT INTEGRATION IN TEACHING AND LEARNING

- Dedicated expertise is appointed and developed at different levels of the system for the planning, management, support, monitoring and evaluation of ICTs.
- Ongoing support to managers is provided at different levels of the system.

BUILD TEACHERS' AND MANAGERS' CONFIDENCE IN THE USE OF ICTs

- Every teacher and manager has the means to obtain a personal computer for personal use, administration and preparation of lessons.
- Every teacher and manager has access to basic training in the use of ICTs.
- Technology incentives for schools and teachers to use ICTs are installed through the “Most Improved Schools Award” programme and other schemes.
- A set of case studies and examples is available to teachers and managers on how to integrate ICTs in management, teaching and learning.

BUILD A FRAMEWORK FOR COMPETENCIES FOR TEACHER DEVELOPMENT IN THE INTEGRATION OF ICTs INTO THE CURRICULUM

- Norms and Standards for Educators are revised to include ICT use and integration.

- All pre-service teacher training in higher education institutions includes basic ICT literacy and basic ICT integration into teaching and learning.
- Teachers have access to in-service training on how to integrate ICTs into teaching and learning.
- Teachers have access to ICT technical support training.
- School managers have access to in-service training on how to integrate ICTs in management and administration.
- Provincial managers are trained in ICT integration to offer support to schools.

ESTABLISH AN ICT PRESENCE IN SCHOOLS

- Every school has a computer and software for administrative purposes.
- 50% of all schools have access to a networked computer facility for teaching and learning.
- 50% of all schools have signed the Microsoft agreement and use the software.
- ICT facilities are being used effectively to facilitate ICT integration into teaching and learning.
- ICT facilities are safe.

SCHOOLS ARE USING EDUCATION CONTENT OF HIGH QUALITY

- Schools are using educational content that is developed according to set national norms and standards.
- Schools have access to an updated database of evaluated content resources and are able to select content for their usage.
- Schools have access to educational content on the Educational Portal "Thutong".

SCHOOLS ARE CONNECTED, ACCESS THE INTERNET AND COMMUNICATE ELECTRONICALLY

- 50% of schools are connected to the Educational Network.
- Networks are safe and information security is monitored.
- Schools use electronic means to communicate with provincial offices.
- All schools have access to an e-rate.

COMMUNITIES SUPPORT ICT FACILITIES

- SMMEs are developed and trained to provide technical support to schools.
- Communities have access to ICT facilities and services, and in return provide assistance in sustainability of the intervention.

PHASE II

SYSTEM-WIDE INTEGRATION OF ICTs INTO TEACHING AND LEARNING

TEACHERS AND MANAGERS INTEGRATE ICTs INTO MANAGEMENT AND THE CURRICULUM

- 50% of teachers are trained in basic ICT integration into teaching and learning.
- Teachers have access to ICT technical support training.
- 80% of school managers integrate ICTs in management and administration.

- Provinces support ICT integration into the curriculum.
- Research and evaluation inform developments and directions in ICT integration.

ICTs ARE WIDELY PRESENT IN SCHOOLS

- 80% of all schools have access to a networked computer facility for teaching and learning.
- 80% of all schools have signed the Microsoft agreement and use the software.
- ICT facilities are safe, effective, designed to facilitate ICT integration into teaching and learning, and in working condition.
- All schools with ICT facilities have a dedicated teacher to manage the facility and to champion the use of ICTs in the school.

SCHOOLS ARE USING EDUCATION CONTENT OF HIGH QUALITY

- The Educational Portal "Thutong" provides access to resources in all learning areas in GET and all subjects in FET.
- Schools use the Educational Portal to communicate, collaborate and access content resources.
- Schools have access to digital libraries.
- Teachers are producing digital content of high quality and making it available to other teachers.

SCHOOLS ARE CONNECTED, ACCESS THE INTERNET AND COMMUNICATE ELECTRONICALLY

- All schools are connected to the Educational Network.
- Networks are safe and information security is monitored.
- Schools use electronic means to communicate with provincial offices.
- All schools have access to an e-rate.

COMMUNITIES SUPPORT ICT FACILITIES

- SMMEs provide technical support to schools.
- Community involvement supports schools to sustain ICT facilities.

PHASE III

ICTs INTEGRATED AT ALL LEVELS OF THE EDUCATION SYSTEM - MANAGEMENT, TEACHING, LEARNING AND ADMINISTRATION

- All departments of education use ICTs seamlessly in planning, management, communication and monitoring and evaluation.
- All learners and teachers are ICT capable.
- ICTs are integrated into teaching and learning in all schools.
- All teachers integrate ICTs into the curriculum.
- All schools have access to a networked computer facility for teaching and learning that is safe, effective, designed to facilitate ICT integration into teaching and learning, and in working condition.

- All schools use educational software of high quality.
- All schools use the Educational Portal for teaching and learning in an outcomes-based education fashion.
- Communities are integrally involved in e-schools.
- ICT interventions are informed by research.

GLOSSARY OF ICT TERMS

Backbone: A backbone holds a network (or several networks) together. It is the main (or trunk) line in a network. All other networks and computers are attached to this backbone. In South Africa, the backbone for government departments is maintained by the State Information Technology Agency (SITA).

Bandwidth: The capacity of a transmission channel to move data between locations.

CD-ROM: (Compact disc, read-only-memory) is a round disk (CD) that is designed to store computer data in the form of text and graphics, as well as hi-fi stereo sound.

Dial-up Internet access: Obtaining connectivity to the Internet by using a modem and standard telephone line to connect to an Internet service provider or other provider of Internet service. Maximum access speed is 56kbps.

Firewall: A software process for preventing undesired access to a network or access device.

High-speed access: Access to the Internet at transmission speeds greater than 128kbps.

Hosting: Providing services to client computers that connect from remote locations, for example, offering Internet access or being the source of a news or mail service.

Information and communication technologies (ICTs): ICTs represent the union of information technology and communication technology. ICTs are the combination of hardware, software and means of communication that brings people together and that enable the processing, management and exchange of data, information and knowledge in order to expand the range of human capabilities.

ICT capability: The ability to use digital technology, communication tools and/or networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society.

Information technology (IT): The electronic display, processing and storage of information, but not necessarily the transmission of the information. IT carries strong historical associations with enterprise data processing and centralised computer services.

Informational websites: Websites that present information only and do not allow for any interactivity or transactions.

Interactive websites: Websites that enable real-time communication and/or transactions between the user and the website.

Internet Service Provider (ISP): A company or organisation that provides a user with a connection to the Internet.

Inter-operability: The capability to provide useful and cost-effective interchange of electronic data among, for example, different signal formats, transmission media, applications, industries, or performance levels; ICT applications can talk to each other.

Kbps: Kilobits per second - a measurement of the speed at which data is being transferred. 1kbps equals 1 000 bits per second.

Local area network (LAN): Computers and other devices that are spread over a limited area and that interact through a common platform.

Network infrastructure: The physical plant of wires, switches, routers, hubs, satellites, broadcast towers, dishes and other hardware that allows communications signals to be delivered across networks.

Network security: Any effort made to protect a network from danger, risk of loss or unauthorised access; in other words, to make the network safe from intruders, errors and other threats.

Portal: A website that aggregates content and provides a methodology for accessing that content. It is a centrally-managed tool, a content and information-sharing platform, containing communications and collaboration applications for teachers and learners. It can serve as a nucleus for building web-based resources for teachers, learners and the community.

Privacy policy: The stated methodology used by a website for handling information collected about users of that website.

Scalability: The ability of a system - including both hardware and software - to handle larger loads when required.

Teleconferencing: The use of audio, video or computer equipment linked through a communications system to enable geographically-separated individuals to participate in a meeting or discussion.

Terminal: An access device that enables the user to view web pages and transmit e-mail.

Universal Service Agency: The Universal Service Agency (USA) was established under the Telecommunications Act 103 of 1996. It operates under the regulatory and policy framework enshrined in the Act as amended in the year 2001 and Ministerial Policy Directions issued in the same year. It seeks to promote the goals of:

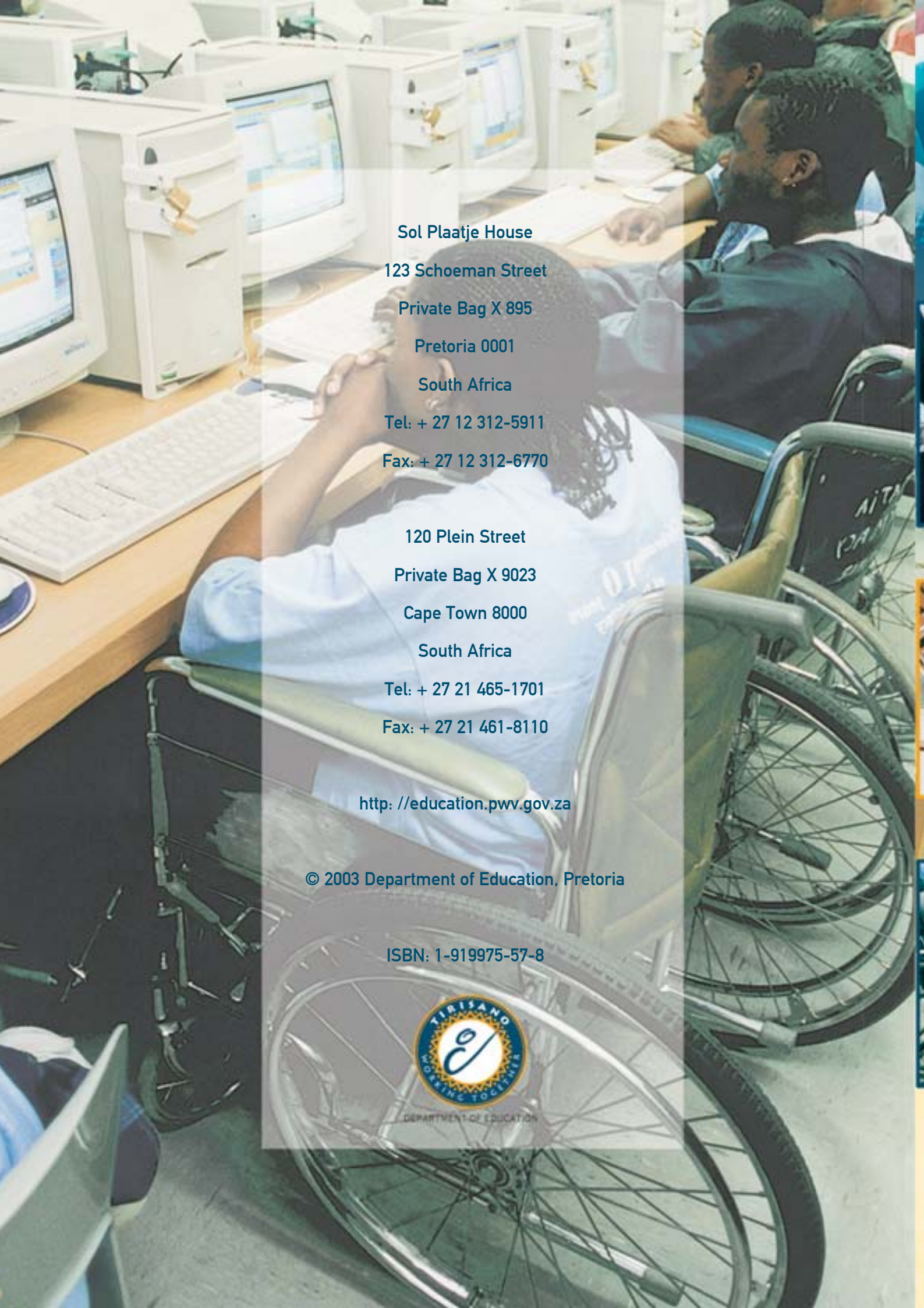
(a) Universal services - a reliable connection to the communication network that enables any form of communication to and from any part of South Africa, and

(b) Universal access - the ability to use the communication network at a reasonable distance and affordable price, which provides relevant information and has the necessary capacity in under-serviced areas where over 60% of the South African population resides.

Virus protection software: Programmes that protect a computer or access device from being infected with software viruses that can destroy or alter data, applications and systems.

Wide area network (WAN): A geographically widespread network; it can be one large network or a number of linked local area networks.

Notes



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ISBN: 1-919975-57-8